

MultiSound[®] Pinnacle Patch Editor/Librarian User's Guide



Turtle
Beach[™]



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INTRODUCTION

The Turtle Beach Multisound Pinnacle uses the Kurzweil MA-1 chip set. This is an extremely powerful synthesizer with extensive editing capabilities and high quality synthesis. Much of the MA-1 technology is based on the Kurzweil K-2000 synthesizer, widely known for its advanced MASSies architecture. The Pinnacle Patch Editor harnesses the capability of this powerful synthesizer. It provides you with complete control over the Kurzweil synthesizer for creating rich and complex instrument patches.

With the Pinnacle Patch Editor you'll be able to create new patches from either existing ROM samples or your own custom samples. Custom samples can easily be created from standard WAV files, providing a virtually limitless sound palette for your Pinnacle. Many sample libraries are available from third parties.

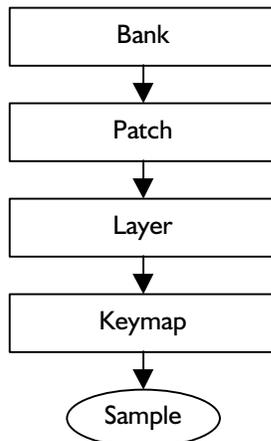
Because of the complexity of the Kurzweil synth, and wavetable synthesis in general, it's recommended that you have a basic understanding of synthesis and sampling techniques. There are many good books available on these subjects. It's a good idea to read up on topics such as filters, envelopes and LFO's, as well as MIDI terms such as modulators, velocities and controllers.

This help file assumes that the user is familiar with the basics of synthesis and of how a sampler works.

OVERVIEW OF KURZWEIL MA-1 SYNTH & EDITOR INTERFACE

This section provides an overview of the Patch Editor interface and gives examples of how the MA-1 features can be used. Its purpose is to give a general idea of the editor's features and what can be done with them. The combination of the Kurzweil MA-1 and the Patch Editor provide an incredible range of sonic possibilities.

There are four main tabs or pages in the Patch Editor Interface. These pages are arranged in a hierarchy in the following order: Bank Page, Patch Page, Layer Page, Keymap Page. A **Bank** consists of a number of patches. A **Patch** is created from one or more layers. A **Layer** contains parameters for shaping the sound including the keymap assigned to the layer. A **Keymap** determines which samples are assigned to which keys on the keyboard.





SAVING YOUR WORK

Although you will be editing Patches, Layers and Keymaps, all data is saved in a Bank. There is no need to save patches, layers or keymaps individually. You can merge patches from different banks from the Bank Page by loading up each bank and copying and pasting the desired patches between them.

USING THE PATCH PAGE TO COMBINE LAYERS:

Patches can be created with up to 32 different layers of sounds. Each layer can be assigned to a key range for creating "splits". For example, a fretless bass could be assigned to the low register of the keyboard, a piano in the middle range and an alto sax at the top of the range to create a jazz combo performance patch.

Layers can also be used to just thicken up sounds. For example, you can create a string, brass, and woodwind layered patch with timpani on the low range for an amazing orchestral patch. Playing one note would trigger all instruments.

Layers can also be mapped by velocity. This gives you the ability to create very responsive and expressive patches. For example, you could create a saxophone patch with soft, breathy performance samples that play when lower or soft velocities are triggered, and hard, wailing sax performance samples when upper velocities are triggered.

This feature is also nice for creating performance patches. For example a piano patch could have strings layered that are only triggered when hard velocities are played.

Lastly, layers can be used to create spacious stereo patches. This can be done by creating two layers of the same keymap sample with slightly different layer settings and panning them hard right and left. For example you could detune each of them slightly and make adjustments to the envelopes, LFO speeds and other parameters. The more variance between the two, the more "separated" they become in the stereo field.

As you can see, with just the layering features alone, there is an incredible amount of flexibility.

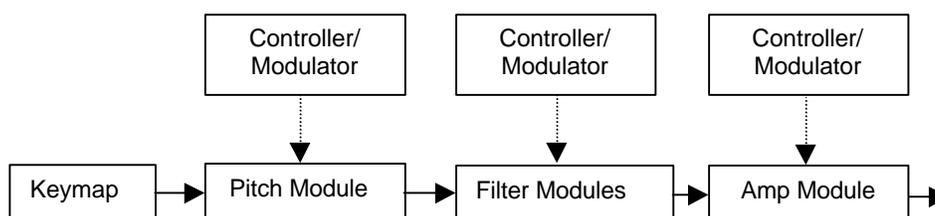
USING THE LAYER PAGE TO EDIT LAYERS

Each layer within a patch can be edited in the Layers Page. In this page you select the keymap to use in the layer. The keymap is a map of the samples used in the patch.

The rest of the parameters shape the sound using four different modules. The Pitch module, as the name implies, shapes the pitch of the patch. The two Filter modules shape the timbre or tone and the Amp or Amplitude module shapes the volume of the patch.

Each of these modules use Modulators to control the characteristics of the patch. There are many types of modulators. A modulator can be a MIDI controller such as the Mod Wheel on your keyboard or the group of Local MA-1 modulators. The tabbed displays directly underneath the Module controls are the Modulator controls.

Elements of a Layer





These include ENVs or Envelope modulators, LFOs or low frequency oscillators or FUNs, short for function generators. FUNs actually take a number of controller sources and perform a mathematical equation on them to output a modulation value. This is a powerful and unique feature of the Kurzweil MASSies architecture.

There can be one or more of each of these modulators used in a patch. The number of modulators is determined by the "Number of Modulators" controls in the upper right of the page. As you increase the number, tab controls for each new modulator will appear.

HERE ARE SEVERAL COMMON SYNTHESIS APPLICATIONS, WHICH USE THESE FEATURES:

USING THE AMP MODULE WITH AN ENVELOPE MODULATOR:

Typically a wavetable instrument patch is created by looping a sample continuously and then applying an artificial decay on the sound to simulate the decay of the natural instrument. This decay is created using the Amp module, modulated with the Envelope (ENV). The Envelope "tells" the Amp module to decay over a given amount of time. This is graphically represented in the ENV tab display.

For example, you can create a piano patch by sampling the initial attack of a piano and looping the end of the sample. Then, by assigning an envelope to the Amp modulator, you can apply a natural decay on the looping portion of the sample to simulate the natural decay of the piano.

USING THE PITCH MODULE WITH AN LFO:

When a violinist plays a note with vibrato, they are simply changing, or modulating the pitch of the note. This can be simulated by using an LFO to modulate the Pitch module.

The LFO (low frequency oscillator) "tells" the Pitch Modulator to change or oscillate at a certain rate. Where things get complicated (and more powerful) is when you control the modulator with an external controller such as MIDI key pressure or mod wheel.

USING A FILTER MODULE WITH THE KEYBOARD VELOCITY:

Very often, natural instruments will sound brighter as they are played louder. This too can be simulated using the Filter Module modulated with MIDI Key Velocity . A single low pass (let's the low frequencies pass) filter can be set up so that harder velocities will let more high frequencies through.

There are of course, much more radical implementations of these parameters. These don't have to be used to just simulate real world instruments. They can be used to create new, undiscovered, sounds.

USING THE KEYMAP PAGE TO CREATE SAMPLE KEYMAPS:

Each Layer uses a sample Keymap as its tone source. The keymaps are created in the Keymap Page. This editor allows you to arrange which samples will be included in the keymap and how they will be arranged or "mapped" on the keyboard.

When a sample is mapped to a range of keys, the Kurzweil synthesizer automatically transposes the pitch of the sample to accommodate each note on the keyboard. A problem however, is that certain types of sounds begin to sound unnatural after being transposed more than 4 or five half steps. This is where multi-sampling and keymaps come in.

A multi-sampled keymap can be created by sampling a number of different pitches of the source instrument, and assigning each of them to a small range of notes on the keyboard. This way, each sample will only have to be transposed a small number of notes before the next sample range kicks in.



Some sounds however, can be transposed throughout the entire range, such as a simple sine wave. Therefore, a key map can also be very simple – just one sample for the entire range.

In the case of drum sounds, it's often desirable to have a different sample triggered by each key, requiring a keymap of many samples.

Keymaps can be made from custom samples or from samples that exist in the Kurzweil's ROM bank. Samples can also be a combination of the two.

OVERVIEW SUMMARY

The Bank Page let's you edit banks of Patches. Patches are made up from one or more layers. Layers can be edited using the Pitch, Filter and Amp modules and are controlled via a number of modulators. These modulators include envelopes, LFO's, FUN's and various MIDI controllers. Each layer also includes a keymap. A keymap is created in the Keymap Page and is made up from one or more WAV samples from either the Kurzweil on-board ROM samples or from original samples.

This section only brushed upon the features and functions of the Pinnacle Patch Editor. There are many features and functions to be discussed in later sections. For now, you have an understanding of the hierarchy of the edit pages and a basic idea of what each of them offers.

FOR MORE INFORMATION...

Unfortunately, the cost of power and flexibility is complexity. The Pinnacle Patch Editor is complicated to say the least and you may have more questions about it after reading this document. We invite you to visit the Pinnacle section of the Turtle Beach website to learn more about the editor and to share your discoveries with other Pinnacle soundware engineers. There's also an area where you can upload your sounds to share with others, or download other peoples banks.

A section dedicated to Pinnacle issues can be found at www.tbeach.com.



CREATING A SAMPLE BASED PATCH

In this tutorial we'll create and add new samples to an existing patch. We'll record the samples first then create a keymap. Once we have a keymap, we'll add it to one of the existing patches which will allow us to quickly play the new samples. This is often a practical and time saving way to start creating original patches.

AUDIO SETTINGS FOR SAMPLE RECORDING

Recording your samples at an optimum level for the Kurzweil Massies chip is the starting point for any Pinnacle Sound Bank you create. For the purposes of this tutorial we will discuss setting the level by using the tools included with your Pinnacle sound card. The techniques we will discuss can also be used as a guideline for scaling waves and sample sets you may acquire from 3rd Party sources. In addition they can be used as a guideline with any other software tools you may utilize in your sample creation process.

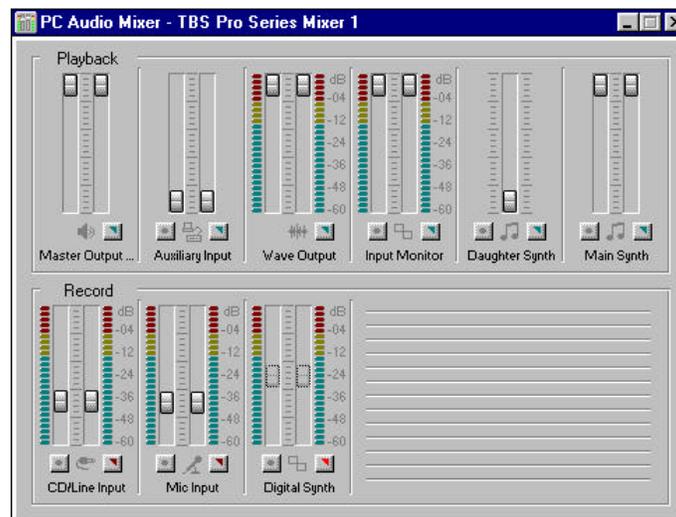
THE TOOLS WE WILL BE USING ARE:

- Pinnacle Patch Editor ver 1.00.39
- AudioView 32 ver 1.01.02
- PC Audio Mixer ver 2.00.61

Note: Before starting turn your powered speakers and / or amplifier down to a MINIMUM setting.

DETERMINING ROM SAMPLE LEVELS:

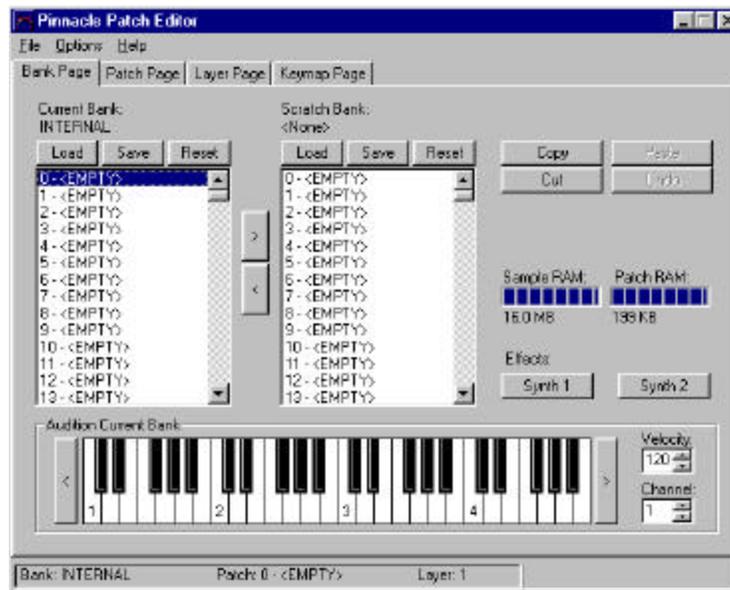
1. Open your **PC Audio Mixer**. If you installed the **Pinnacle** software to its default settings, you will find it in the **TBS Pro Audio** section of your Start / Programs dialog boxes.
2. Your **PC Mixer** should look like Figure1 below.S



3. Right – click your mouse while the mouse pointer is over the **PC Mixer** heading and select the Always on Top feature.
4. Set your sliders to the positions shown in Figure 1 (**If you have not turned down your speakers and amplifier do so NOW**)
5. Click on the **Advanced Options** button in the **Main Synth**.
6. You will see a new dialog box as shown below in Figure 2.

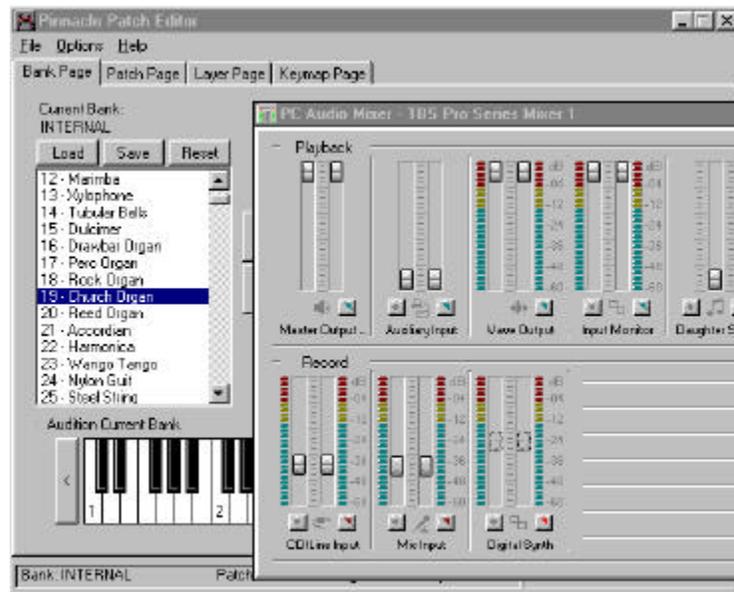


7. Set the **Synth Voice Gain** slider to the middle marker (50%)
8. Locate and start the **Pinnacle Patch Editor**. Figure 3 below



9. If your Internal Bank appears empty as above (Figure 3) – click on the Reset button to restore the patch names.
10. Select the **Digital Synth** on the PC Mixer.

11. With both the **PC Mixer** and the **Pinnacle Patch Editor** on your screen pick a few Rom based **Kurzweil** samples such as the Church Organ, Acoustic Piano, etc. as illustrated below in Figure 4. Hold down one of the Piano Keys with your mouse and monitor the volume shown in your **PC Mixer's - Digital Synth** window.



12. The internal **Kurzweil Rom Samples** play back at approximately -24db with the mixer settings adjusted as detailed in Figures 1 & 2. This tells me that any sample I record or import into my **Pinnacle** should have its gain adjusted to a -24db setting. You may experience slight differences so tweak the recommended -24db setting to the level your **Pinnacle** displays. We have found that the -24db setting will give optimal results in most situations.
13. Minimize the **Pinnacle Patch Editor**

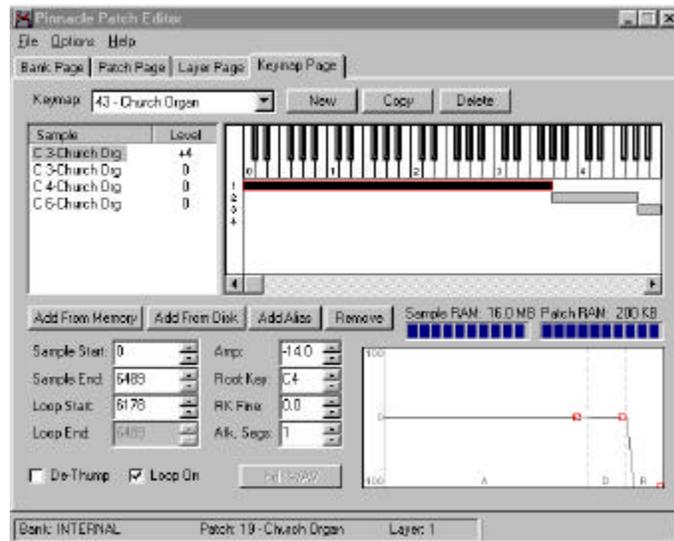
SETTING RECORDING LEVELS IN AUDIOVIEW 32

14. Set up your external recording gear (mics, effects, etc.) and adjust any gain controls on your equipment to give you the maximum gain w/o distortion. You're back in the analog world now, so adjust per your equipment manufacturer's recommendations.
15. Once you got a good clean signal to feed to your **Pinnacle** input you're ready to load up **AudioView 32** to record your sample. You'll find **AudioView 32** in your **Pinnacle Patch Editor** directory.

16. Load **AudioView 32** (Figure 5) located in your **Pinnacle Patch Editor** and with the **PC Mixer** adjust your line input to achieve a -24db reading on your **PC Mixer's** Line Input LED's.

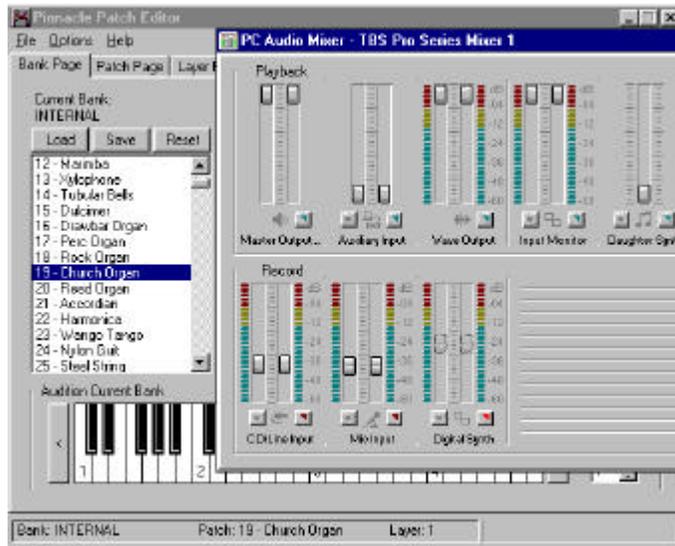


17. Bring up the Pinnacle Patch Editor and tab over to the Keymap page (Figure 6).
18. Follow the instructions for loading a sample and creating a keymap found on page 10 of the **Pinnacle Patch Editor** PDF manual.





19. Once you have a sample loaded and mapped, verify the samples amplitude by playing it as a midi note and monitoring the digital synth led readout as you did in steps 3 through 13 (Figure 7). Verify the sample is playing at the correct volume and repeat these steps for each sample you load.



Your samples should now not only be clean and distortion free, but will also play at the same relative volume as any of the internal **Kurzweil Rom** samples.

TIP

If you are starting with a normalized sample we have found that using the **AudioView 32 Scaling** option and setting it to 40% results in a -24db amplitude.



CREATE A SAMPLE (S)

The process of authoring a patch begins with creating one or more samples . Samples can be created and edited with Voyetra's Audio Edit. For this tutorial we'll create a patch with two samples, so we'll need to record two new samples.

RECORD A SAMPLE:

1. Run Audio Edit.
2. From the File menu select New
3. Set the New File Attributes to record at 22k, 16 bit, mono.
4. Setup the Pinnacle Mixer for recording. For this tutorial you can simply hook up a microphone and sample your voice. Hook up your microphone to the Mic input, and select Mic as the record source. Set the recording level to a moderate level for now. You can tweak this level later if your recording is too low or too hot.
5. Now it's time to record something. Click record to place Audio Edit in record standby mode. Click Play to start recording and sing a short note into the Mic. For now a 1 or 2 second recording is fine.
6. Now trim off the excess silence at the beginning and end of the file so it's a clean sample with just the desired portion of the recording.

SET LOOP POINTS:

Now it's time to set the loop points. Typically you'll want the attack portion of the sample to play once and the loop to happen during the sustaining portion of the sample, toward the end. This loop can be as short as one cycle, or many seconds long.

1. From the Window menu, select Loop Control, if not already selected.
2. Set some starting loop points by typing in some reasonable numbers. Use the ruler above the wave display for a reference. For example, if the wave is 30000 samples long, make the Start loop point 10000, and the End loop point 25000.
3. Now Audition the loop by pressing the "Loop Play" button on the Loop control toolbar. This will repeatedly loop the file so you can tweak it.
4. You will hear clicking as the loop repeats. This is OK for now. Try dragging the handles at the top of the loop markers to adjust the loop points.
5. Once you have a general idea of how long you want the loop to be, you can use the Snap to Zero crossing buttons to tweak loop and try to silence the click that happens when the loop repeats. Snap to Zero moves the loop point to where the waveform crosses the zero amplitude point. This is the best place for an edit. Finding a clean loop is an art form so be patient. Sometimes it takes a bit of experimenting.

CROP UNUSED PORTIONS

Now that the loop point is set you can use the delete and trim/crop features to remove any extra sample data that you don't need. Especially the data after the loop point. This will never be heard so you might as well trim it off so you can save the sample RAM space.



SET ROOT KEY

The last thing to do is set the root key to the note that you sang. For example, if you sang middle C then you should set the Root Key to C3. This will provide a reference when you go to map the key to the keyboard. Don't worry if you don't know which note you sang for now. Just so you know that you can set it here when you create your own instruments later.

SAVE

Now that the sample is prepared you should save it and create another one. You may try sampling something percussive like a handclap for this tutorial. Note that you typically wouldn't loop a percussive sample. For example, most drums are not looped. They only play once when the key is pressed.

CREATE A KEYMAP

A keymap is a table that defines which samples will be played with which keys on the MIDI keyboard. A single sample may be mapped to the entire keyboard, or you can have a different sample on each key, as is often the case with drum patches. For our tutorial we'll map the vocal sample to half of the keyboard and the second percussive sample to the other half of the keyboard.

RUN THE PATCH EDITOR

When you launch the Patch Editor it will upload all the Patch, Layer, Keymap and Sample data currently in the synth. This may take a few seconds. You can turn this feature off in the Options menu under Preferences, however it's recommended that you leave it on so the Patch Editors information will be "synched" with the Pinnacle hardware.

SELECT KEYMAP PAGE TAB

This is where the keymaps are created. The top portion shows the samples in the current keymap on the left and a graph of how the samples are mapped to the keyboard on the right. At the bottom of the window are a number of controls for adjusting sample header information. This includes loop points, root key and amplitude. There are even parameters for setting an amplitude envelope for each sample. For now don't worry about the loop parameters.

SELECT "NEW" NEXT TO CURRENT KEYMAP

This will prompt you to enter a name for your keymap. Once you enter a name the new keymap will be added to the keymap list in the Keymap drop down box control. It will occupy the next available empty slot after the 129 GM keymaps and it will be displayed in the keymap window as the current keymap.

SELECT "ADD FROM DISK"

Add the two new files. You'll have to select "Add From Disk" for each file. The samples will appear in the sample list and a horizontal bar will appear for each sample in the keymap display. Each bar shows which keys the current sample is mapped to.

Note that the samples should be loaded in the order you want them to appear on the keyboard, from left to right. So, typically the highest pitch would be loaded, followed by the next lower pitch and so on. In the case of drums, they should be loaded in the order they will appear on the keyboard, from left to right.

Note also that the list of samples in the Keymap Page Tab is in last to first order. In other words, the sample you most recently loaded will be displayed at the top of the list.

ADJUST THE ROOT KEY

If you set a root key in the Audio Edit program then this will be set automatically. Please note, the root key shows 2 octaves higher than set in AudioView. If no root key was set you may not be able to hear the patch until the root key is within the normal range. If you can't hear your sample, try adjusting this parameter and auditioning until you hear the sample come into the pitch range.

The highest sample rate that the Kurzweil synth can play is 96 kHz. If you ask it to play higher than that you'll hear silence. The thing you need to keep in mind is that a 44.1 kHz sample can only be transposed up about 13 semitones before you hit the 96 kHz limitation and then you'll stop hearing it.

MAP THE SAMPLES ON THE KEYBOARD

Move the mouse over the end of one of the bars until a right/left arrow is displayed. Then drag the bar to indicate which keys will trigger the sample. Do this for each of the samples so that each is mapped to a range on the MIDI keyboard.

SETUP THE KEYMAP IN A PATCH

Now it's time to add the keymap into a Patch. We'll use an existing patch for now. This is an easy way to experiment and work on keymaps.

1. Go to the Bank Page and Select the Trumpet Patch. This patch only has one layer.
2. Go to the Patch Page. Add a layer. By selecting 2 with the up/down arrow from the layers window.
3. Go to the Layer Page and use the Layer Spin Controller to get to layer 2.
4. Change the keymap to your new keymap.
5. You should be able to play your new sound from the keyboard or from any of the on-screen keyboards in the Bank, Layer or Keymap pages.

Congratulations, you just made your first patch. By now you should have a good idea of the editing power that Patch editor offers. We recommend that you go through the reference section for more detailed descriptions of patch Editor's functions.



ADVANCED TUTORIALS

CREATING A LAYERED PATCH

1. Go to the Bank Page. Click on the patch location where you would like to be able to play your new layered patch.
2. If the slot you clicked on is not <EMPTY>, then click and drag the patch out of the bank and lift up on the mouse button. The slot is now empty (although you'll still be able to hear the general MIDI patch assigned to that patch number for now).
3. Now go to the Patch Page. You'll notice that you now have a GM Piano keymap on layer 1. This is the default keymap (#0). Click on the number of layers spin control to create a 2nd layer.
4. Now go to the Layer Page and click on the keymap drop list. Select 29, Distorted Guitar.
5. Now drop the Layer list and select layer 2. Also drop the keymap drop list and select keymap 7, Pick Bass.
6. You're done. When you return to the Patch Page, you can audition your layered patch.

TRIGGER LAYERS BY VELOCITY

1. Let's continue the above example. We now want the patch to play guitar all the time, and add bass when we really hit it. Start at the Patch Page. Click on Layer 2, the Pick Bass layer.
2. Now click on Velocity at the bottom of the page, causing the Velocity map to be drawn.
3. Now click on the left edge of 2nd range bar in the range editor and drag it up to around the 108 position.
4. Audition it.

ADD A DELAY TO A LAYER

1. Working with the same patch, let's make the bass patch play slightly behind the guitar. Go to the Layer Page and drop the Layer list box and select Layer 2, the Pick Bass layer.
2. Go to the Miscellaneous page in the module section of the page. In the Layer Delay box, crank the delay up to 100 ms.
3. Go to the Patch Page and audition it. Remember, you have to hit with some velocity just to hear the bass.

CREATE A KEYBOARD SPLIT PATCH

1. Go back to the Patch Page. Click on Velocity to show the Velocity map. Pull the 2nd Velocity range bar back down to 0 so the bass layer always plays.
 2. Now click on Keyboard at the bottom of the page so the Keyboard range map is now displayed.
 3. Click on the 2nd range bar to select layer 2. Click on the right edge of the bar and drag it down to C4. Click on the 1st range bar to select layer 1. Drag it from the left edge up to C#4.
-

4. Now you have a split that plays Pick bass at the lower half of the keyboard and guitar at the upper. You probably want to go back to the layer page, select layer 2 and get rid of that delay.

CROSSFADE TWO LAYERS

1. Now we're going to make the guitar crossfade into bass. Go back to the Patch Page and drag both range bars so that both layers play across the entire keyboard.
2. Now go to the Layer Page. Make sure Layer 1 is active. Create a local ENV modulator by spinning the Number Of Local ENVs spin control to 1.
3. Drag the Attack Segment point up to the top of the window so it's value is about 0.9. Make it's length around 0.5 seconds.
4. Go to the Amp page in the modules section at the top of the Layer Page. Set the Xfade Controller to MA-1 Local Modulators \ Local Envelope 1.
5. Now pull up Layer 2, the Pick Bass layer. Create a Local Envelope in this layer and make set it up identically to the Local Envelope we created in Layer 1.
6. Go to the Amp page in Layer 2 and set its Xfade Controller to Local Envelope 1.
7. Finally, go to the Miscellaneous page in Layer 2 and check the Invert Xfade Sense button.
8. Audition the patch. You'll hear the guitar fade out as the bass fades in. Play with the envelope segment duration. You'll find that as you lengthen the duration of the Layer 1 envelope, the guitar plays longer and as you lengthen the duration of the layer 2 envelope, the bass takes longer to fade in. You can create envelopes that overlap, causing a gain boost or envelopes that don't overlap and cause a big gain drop. Have fun with this powerful feature.

CREATE A VIBRATO EFFECT

1. Now we're going to add vibrato to the bass. Select Layer 2 in the Layer Page.
2. Add a local LFO by clicking on the Local LFO Modulator spin at the top of the page.
3. Set both the Max Rate to 2.35 and make sure the rate controller is Fixed at 1.0. Leave the shape at a Sine with Phase 0.
4. Go to the Pitch Page above and click on Add Pitch Modulator. Double click on the modulator that appears so you can edit it. In the dialog box, set Input Controller to Local LFO 1. Set Depth Min to 0, Depth Max to 406, and Depth Controller to Fixed 1.0.
5. Audition. You can modify this in so many ways that it would take weeks to try them all. Some fun ones to start with would be: increase the Max Depth and map the Depth Controller to the MIDI controller of your choice (mod wheel would be nice); map the rate controller in the LFO to Current Key (now higher keys have faster vibrato); you get the idea.

CREATE A FILTER SWEEP EFFECT

1. Next, we'll add a filter sweep to the guitar part of our patch. Select Layer 1 in the Layer Page.
 2. In the Filter 1 page, select the 'Part I of 2 Pole Lowpass' in the Filter Type drop list.
 3. Make sure the Coarse Hz setting is very low, around 73 or so.
 4. In the Filter 2 page, select the 'Part II of 2 Pole Lowpass' in the Filter Type drop list.
 5. Add another local envelope by clicking on the Local ENV Modulator spin at the top of the page.
-



6. Set up the Local Envelope so that it has two Decay segments by clicking on the D spin in the Segments section. Make the segments look like this:
 - Seg 1 (attack): Time = 0.32, Value = 0.789
 - Seg 2 (decay 1): Time = 0.30, Value = 0.555
 - Seg 3 (decay 2): Time = 0.48, Value = 0.758
 - Seg 3 (release): Time = 0.72, Value = 0.000
7. Now attach the envelope to the Filter by clicking the Add Filter Modulator in Filter 1. Double click on the modulator entry so you can edit it. Set the Input controller to Local Envelope 2 (the one we just created), set the Depth Min to 0, the Depth Max to 12700, and the Depth Controller to Fixed 0.50793.
8. Audition. Wow, that's cool.

ADD AN AMPLITUDE ENVELOPE

1. We've already got this thing sounding like it has an attack envelope because of the cross fade so let's give it some release with an amplitude envelope. Start by selecting Layer 1 in the Layer Page.
2. Create a new local envelope (this one is Local Envelope 3 in this layer).
3. Set up the new local envelope to have a 7.5 second release segment going to 0.992:
 - Seg 3 (release): Time = 7.52, Value = 0.992
4. Go to the Amp modulator and click on Add Amp Modulator. Double click on the entry to edit it and set the Input Controller to Local Envelope 3, set Depth Min to 0, set Depth Max to -127 and set the Depth Controller to Fixed 1.0.
5. To enable the amp envelope you must go to the Miscellaneous page and click on the Natural Envelope On to DE-activate it. This must NOT be checked.
6. Audition it. Check out the filter closing up in the release. You'll certainly notice that you're not getting a 7 second release. That's because the crossfade envelope limits the release envelope. You can of course get longer release times on layers that aren't crossfaded. Play with it.

USING MODULATORS TO CONTROL THE DEPTH OF OTHER MODULATORS

1. Now we're going to go off the deep end by adding an LFO to the amp module of the bass and we're going to modulate it's depth by a new envelope.
 2. First, we have to create the envelope because you cannot use a modulator in another modulator if it was not defined before the modulator who is using it. That was a mouthful. Go to Layer 2 in the Layer Page and add another ENV modulator. That's local envelope number 2.
 3. Set up the envelope with 2 Decay segments. Set up the segments to look like this:
 - Seg 1 (attack): Time = 2.00, Value = 0.000
 - Seg 2 (decay 1): Time = 2.64, Value = -0.46
 - Seg 3 (decay 2): Time = 0.02, Value = -0.14
 - Seg 3 (release): Time = 0.00, Value = 0.000
 4. Add another local LFO. That's Local LFO number 2 if your continuing. Set up the LFO Shape to be a Square wave and set the Max Rate to 4.22.
 5. Attach the LFO to the Amp module by clicking on Add Amp Modulator and then double clicking on the entry. Set the Input Controller to Local LFO 2, the Depth Min to -16 dB, the Depth Max to +6 dB, and the Depth Controller to Local Envelope 2.
-

Audition it. The bass will get loud, clipping slightly, and then drop quickly after a 4 or 5 seconds if you sustain. Play with Local Envelope 2 to change the loudness of the pulsing bass.

ADD A CUSTOM DRUM SOUND TO THE GENERAL MIDI DRUM SET

1. Adding a new sample to your GM drum set is fairly easy once you know where the kit patch is stored. It's at patch 130. It can be a little mind-boggling at first to look at the 29 layer patch, so let's break it down a little. First, you'll probably want to replace something like a kick or snare, so let's find where you want to put your new sample. There are three or so main keymaps, and a bunch of small ones. The first one, GM Drums 1, contains a lot of basic drum set elements like kick, snare, hats, toms. The second, GM Drums 2 contains a lot of percussion elements. The third, Drums Center is the one that interests us now. Let's look at replacing the snare.
2. Highlight Layer 2 (Drums Center) in the Patch Page. Now go to the Keymap Page. Let's replace Snare 1. Start by clicking on Snare 1 in the sample list on the top left. Now click on 'Add From Disk' and find the snare file you want to add in the file dialog. After the file has loaded, click on the old 'Snare 1' in the keymap and then click the 'Remove' button, deleting it from the keymap. Now click on the new wav file entry and make sure the key range is correct and also set the Root Key to the appropriate value (D3 in this case).

ADJUST THE PITCH OF A SAMPLE

1. To adjust the pitch of the drum sample you just uploaded, click on the sample name in the sample list at the top left of the Keymap Page. The values at the bottom of the page now reflect this sample's parameters.
2. Enter the value of the key at which the sample plays at its original pitch in the Root Key box. In this case it will be D3.
3. To hear how the sample plays at other pitches, try entering new values. To raise the pitch, enter a lower key value (thus pushing the root key down further). To lower it, enter a higher key.

To tweak it in, try changing the RK Fine value (Root Key Fine) which is shown in cents. This works as you think it would: positive numbers raise the pitch slightly, negative ones lower it slightly.

ADD AN AMPLITUDE ENVELOPE TO A SINGLE SAMPLE

1. You can very easily add an envelope to your new sample by clicking on the Atk Segs spin control on the Keymap Page. I recommend adding two segments.
2. Drag the first box to about the halfway point of the window and have it just slightly angled below the zero line.
3. Drag the second box down to the bottom rapidly making a quick cut off.

Listen to the sample it should have a rapid almost gating decay. Play around with the envelope until you get something you like.

TWEAK THE LOOP IN A SAMPLE

1. If you have a loop in a sample, you may find that the MA-1 does not reproduce the loop exactly the way your editor did and you have to tweak it. To do this, just select the sample in the Sample list in the Keymap Page.
-



2. At the bottom of the page, move the Loop Start or the Sample End values one sample at a time and audition the sample until you find a glitchless point. Remember that the MA-1 considers Sample End to be Loop End in a looped sample.

TIPS ON SETTING UP A STEREO PATCH WITH YOUR OWN SAMPLES

One of the most common actions you will perform with the patch editor will be setting up your own stereo patch using your own stereo WAV files. Since a WAV files left and right channels are interpreted by the Keymap Editor as separate samples it's a bit tricky. The general idea is that you need to create a two layer patch. One layer with the left channel samples, one with the right. Here's how we recommend you do it:

1. From the Bank Page, click on the patch location where you want to store the new patch. Don't worry if something's already there.
2. Go to the Keymap Page.
3. Click on New to create a new keymap. Name it 'Stereo Patch L'.
4. Click on Add From Disk and add your stereo files, starting with the samples that will play at the highest keys and working your way down. Don't worry about the ranges yet and don't delete the right channel samples yet.
5. Click on New again to create your right channel keymap. Call it 'Stereo Patch R'.
6. Click on Add From Memory this time. Add all the right channel files (they'll have a wavr extension) starting with the samples to be played at the higher keys.
7. Clean up the ranges and the root key of each sample.
8. Select the 'Stereo Patch L' keymap. Now it's time to delete the right channel samples. Clean up the ranges and root keys of the remaining left channel wavs and make sure they match the right channel keymap.
9. OK, now it's time to adjust the patch. Go to the Patch Page. You should still have the 'Stereo Patch L' keymap selected for this layer. Pan the layer hard left. Go to the Miscellaneous Page of the Layer Page and make sure that the Natural Envelope On is checked and also make sure the Fixed Pan box is checked.
10. Create a new layer by using the spin control at the bottom or by dragging layer one into layer 2 clicking in the fader where it is labeled 'Layer 1'. Pan Layer 2 hard right.
11. One more step. Click on Layer 2 to activate it and go back to the Keymap Page. Select 'Stereo Patch R' as the keymap and you're done. Now, to rename the patch, go back to the bank page, right click on the current patch and select rename patch.

You can save yourself an enormous amount of time if you intend to hook up a lot of modulators or setup elaborate filters by doing two things. First, if there is a patch layer that provides a good template for what you want, copy it into layer 1 before you start anything. The easiest way to do this is by going to the Layer Page, selecting Layer 1 and right clicking on it. Select 'Copy Layer From' and choose the template layer in the ensuing dialog. The other time saver is an extension of this idea. Once you have laid out both keymaps and you are ready to set up the layers, concentrate on only the left layer. Pan it center. Now go to the Layer Page and set up any additional modulators or pitch/filter/amp settings you may need. Now, assuming that you want both channels to react similarly to modulators, go back to the Patch Page and just drag Layer 1 into Layer 2 and you're all set. All you have to do is select the appropriate keymap for Layer 2 and you're done.

REFERENCE SECTION

FILE MENU

SAVE BANK

This command lets you save the Current Bank to a file. Patches are always saved as a bank, never as individual files. Patches from different banks can be copied into the same bank using the Bank Page.

Note that this command does not save the Scratch Bank. Use the Save button above the scratch bank to save its contents.

OPEN BANK

Use open bank to load a previously saved bank.

EXIT

Quits the patch editor. Note that the state of the synth will remain intact. This is important to note because if you load a bank of patches, quit the editor, then play a game or a General MIDI file, it will more than likely sound wrong. If this happens, simply launch the editor again and press the Reset button for the Current Bank to reset the default General MIDI patches.

OPTIONS MENU

AUDITION

Allows you to set the MIDI input device. This is the driver, which controls the MIDI interface input on your PC. This needs to be set to your MIDI input driver for patches to be auditioned from an external MIDI keyboard or controller.

TUNING

Allows you to set the master tuning of the Kurzweil Synth.

Each MIDI channel can have a separate tuning setting by selecting a channel or the entire synth can be adjusted by selecting All from the MIDI Channel control.

Pressing the Save as Defaults button will preserve your custom tuning setting permanently, or until you change them again.



PREFERENCES

STARTUP TAB - LOAD SYNTH STATE

Uncheck this option if you prefer to not have the editor upload the current state of the synth each time the editor is run. This will save time when the Patch Editor is loaded. However, if you already have non-stock patches loaded, you'll want to load the current state of the synth to synchronize the editors patch data with the synthesizer's patches.

STARTUP TAB - SEND DEFAULT BANK

Lets you set up a custom bank, which will automatically be loaded each time the patch editor is run. It eliminates the wait for the download of names and patches but replaces it with the wait while the default bank is uploaded.

WAVE TAB

Let's you assign the default wave editor.

REFRESH WAVES

Use Refresh Waves to reload your samples after editing them. Otherwise, your changes will not be reflected.

STATUS AREA

The status area displays the current Bank, Patch and Layer being edited. As patches you create become more complex you'll find the current Layer status especially helpful so you always know which of the layers your currently working on.

The status area also provides progress information while new banks and samples are being downloaded.

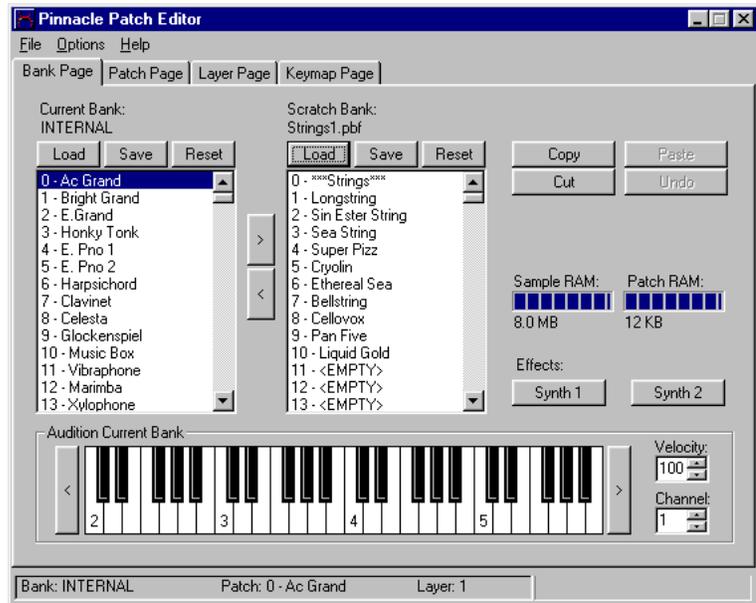
BANK PAGE

OVERVIEW

The Pinnacle Patch Editor's Bank Page lets you create, save and load customized banks to the Pinnacle's onboard synthesizer. These banks can be tailored to suit your particular applications or needs by copying and pasting patches between multiple banks. Using the Bank Page, the synth can be completely reconfigured quickly and easily just by loading a bank. Banks are saved in the Pinnacle Bank File format or PBF.

PBF files contain all the patches, keymaps and sample information — everything except the sample data itself.

When the Editor starts up, it loads all of the patch information currently in the synth. The Editor continues to track all changes made to the synth. That way, you can save the state of the synth at any time. Once the data is received, all the patches display in the Current Bank list box. Any patch listed in the Current Bank list box can be auditioned by clicking to highlight it and then clicking a key on the Audition Keyboard.



BANK DISPLAYS

The Bank page lists two banks, the Current bank and the Scratch Bank. The Current Bank contains patches that are currently loaded in the synth. The Scratch Bank provides a way for you to view a second bank so you can copy or move patches between two different banks.

SAVING AND LOADING BANKS

Bank files can be loaded and saved from either the Current or Scratch bank using the Load and Save buttons.

EDITING BANKS

Editing banks is easy. You can Cut, Copy and Paste patches from one bank or patch location to another using the Copy, Cut, Paste buttons or the common keyboard commands — Ctrl+X (Cut), Ctrl+C (Copy) and Ctrl+V (Paste). You can also drag and drop patches using the mouse.



WORKING WITH THE SCRATCH BANK FEATURE

The Pinnacle Patch Editor boots up showing you two discrete bank lists. The list on the left is labeled Current Bank and always shows the patches that are currently in the synth (if you let the PE detect the current synth state). Any patches you edit or drag into the synth bank are changed in the synth and are immediately auditionable. The Scratch Bank on the right is a different story. It is a virtual bank provided for you to create banks quickly and conveniently and then save them for later loading. At first you might say, 'What in the world do I need that for?' Let me give you some ideas.

While working on a song, you may want to add a patch that exist in a different bank to your current working bank. You can load the bank with the new patch into the Scratch Bank. Then find the desired patch and drag it over to the working bank. Then save the working bank.

You may have noticed that it sometimes takes a while to load banks that only have a handful of edited patches in them. This is because if you save the Current Bank as a PBF file, it saves the entire state of the synth, including all GM patch data, in case it was edited. There is a way around this and it can really speed up bank loads. The idea is to always edit and create your patches in the synth bank where you can audition them easily, but build your banks in the Scratch Bank where the GM patches do not get saved. For example, from the Synth Bank, create a new keymap and upload your own Wavs. Edit the patch and rename it. Now, reset the Scratch Bank and drag the new Patch into the location where you foresee you will be using it. Repeat for all the patches you need on a particular tune (except this time don't reset the Scratch Bank, just drag your patch to a different loaction). Now save the Scratch Bank as a PBF. Reset the Synth Bank and load up the PBF file and watch it rip. You'll notice that the GM patches don't show up in the list but are still playable.

RESET

The Reset button restores all patches to the stock General MIDI set.

EFFECTS BUTTONS

The MA-1 has two effects engines running simultaneously. One can be used for reverb type algorithms and the other for chorus/delay type algorithms. The MA-1 has 9 reverb presets and 8 chorus/delay presets in its OS in ROM, used by each of the respective FX engines. Effect type and level can be set by clicking on the Effect buttons on the bank page. However, there is no interface available to change any of the effects parameters in real-time or otherwise. Only the effect type and mix level can be modified, and on a per MIDI channel basis. Effects are not stored with the patch

There are two buttons for launching controls for modifying the on board effects for both the main Kurzweil MA-1 synth (Synth 1) and the Kurzweil Daughterboard Synth (Synth 2)

Use the digital effects to change the amount of Reverb and Chorus on the onboard synthesizer. A Reverb preset can be selected in the Effects 1 processor, while a Delay or Chorus preset can be selected in the Effects 2 processor.

Turning the Effects 1 or Effects 2 level in the All column changes the level on all MIDI channels.

Note that the effect levels can also be controlled from an editing environment such as Digital Orchestrator using MIDI controller messages.

AUDITION KEYBOARD

The Pinnacle Patch Librarian's Audition Keyboard is useful for playing the patches in the synth. Use the buttons at either end of the keyboard to change the octave of the keyboard.

The Velocity spin buttons determine the Note On Velocity when the Audition Keyboard is played.

The MIDI Channel spin buttons determine on which MIDI channel the Audition Keyboard plays.

CONSERVING RAM

There is a limitation of the MA-1 synth that makes only 12K bytes available for Program or Patch RAM. When you use the GM patch set as is, you are not consuming any of this 12k since the GM patch set is stored in ROM. As soon as you modify a single parameter in a GM patch however, that patch is stored in RAM and begins to whittle away at your 12k bytes. These are the AVERAGE sizes of the various objects that comprise an MA-1 instrument:

- Patch - 256 bytes
- Layer - 16 bytes
- Keymap - 40 bytes
- Sample Header - 54 bytes
- Alias - 4 bytes + Sample Header

What do these numbers mean? Well, let's say that in an average patch, you use two samples an octave and want a four octave range. You're going to need 256 bytes for the patch, 40 bytes for the keymap, and 8 sample headers (432 bytes). That totals 728 bytes. You'll only be able to have 16 or 17 patches like this in RAM at once, but that is generally enough for a tune and you can always load new banks for different tunes.

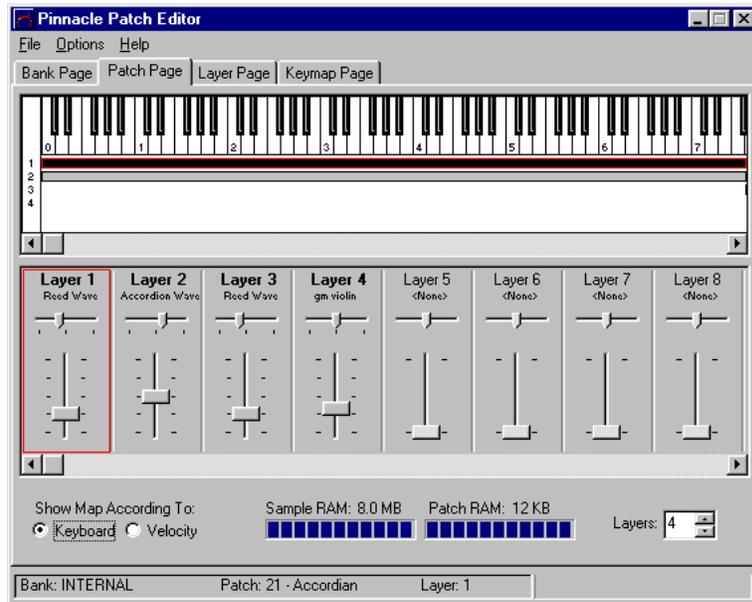
You can conserve RAM by only loading samples into the intended range of the instrument. In the above example, if you know you're only going to use three octaves of the instrument, you can save 108 bytes by only loading 6 sample headers.

If you only want to load your own samples to overwrite a GM patch, you can conserve lots of Patch RAM by just replacing the samples and leaving the Patch data alone. Just go to the keymap page and create a new keymap and load your samples into it. Be sure not to change the Patch name, though, or the entire patch will have to be copied into Patch RAM so the name data can be changed.

PATCH PAGE

Layers can be arranged in the patch page to create multi-layered patches. You'll find you can make dozens of interesting patches by just combining the existing layers in various ways.

Layers can be mapped to either velocity ranges or keyboard pitch ranges. This provides the ability to create split keyboard patches as well as complex multi-layer patches where layers are triggered by different keyboard velocities and/or pitch zones.



KEYBOARD / VELOCITY MAPPING OPTIONS

These two controls toggle the layer mapping display between Keyboard mode and Velocity mode. Keyboard mode allows you to map various layers to a given range of keys on the keyboard. Velocity mode allows you to map layers to different velocity ranges. Although the display is mutually exclusive, the functions are not. You can have layers mapped to both keyboard ranges as well as velocities simultaneously.

KEYBOARD MAP DISPLAY MODE

In Keyboard mode layers can be mapped to a range on the MIDI keyboard. For each layer a horizontal bar represents the notes which will be triggered by the keyboard. A layer can be limited to a smaller range of notes by simply grabbing the end of its bar and dragging it to the desired keyboard range.

This feature allows you to quickly make multi instrument keyboard splits. For example, you could have a piano sound on the upper range and a double bass on the lower range to create a jazz combo performance patch.

VELOCITY MAP DISPLAY MODE

In Velocity mode, layers can be mapped to trigger at different key velocity levels. The horizontal bars under the keyboard in the velocity range display show the velocity range for each layer. By dragging the ends of a bar, a layer can be limited so it only triggers a given velocity.

This feature is useful for a number of applications. For example, different instruments can be triggered at different key velocity levels. Therefore, you could have a piano patch with strings layered as you play softly and horns layered as you play harder.

Another application of velocity mapping is to trigger different performances of a given instrument at different velocities. For example, a smooth, mellow sax sound could be triggered at soft velocities, and a louder, edgy sax sound at harder velocities. This feature provides the potential to create extremely expressive instruments and instrument simulations.

NO. OF LAYERS CONTROL

There can be up to 32 layers in any one patch. The Number of Layers control is used to set the number of layers. As each layer is added, a grayed out slider will become active. It's important to note that for each layer that is activated, the size of the patch increases. Therefore it's recommended that you only activate the number of layers needed for a given patch. Doing this will conserve patch RAM.

LAYER LEVEL AND PAN SLIDERS

Level sliders are provided on each layer to control its relative gain and pan. Use these sliders to create a "mix" of the current layers. Note that it is easy to make some samples distort if the level is set too hot. If clipping occurs in your patch simply lower the level a bit.

TIP

Create a stereo version of an existing patch by assigning its keymap to two different layers, then pan them hard right and hard left. Once that's set use the fine detune parameter in the Layer Page to detune each layer slightly. This will produce a wide stereo image. You can also try setting a Layer Delay (Layer Page | Miscellaneous Tab) on one layer to get a stereo echo effect. Please note, you must follow set up stereo patches procedure to have this work.

COPYING LAYERS

At times, you will find that you could save an awful lot of time if you could just copy all of the modulators and settings of the various modules in one easy copy function. Well, you can. Any time you want to copy a layer, all you have to do is go to the Patch Page. If you want to make an 'intra-patch' copy, that is, copy a layer to another layer within the same patch like you would if you were making a stereo patch, all you have to do is drag and drop the layer. Make sure you click down on the layer you are copying in the label area where it says 'Layer x.' If you want to copy to or from a layer in another patch, right click in the layer you want to work with and you'll get a menu. You'll see a menu with the items 'Copy Layer To...' and 'Copy Layer From...'. When you click on one of these, you'll get a dialog box that will allow you to select any layer in any patch in either of the banks that are in memory. Click on the layer you desire and it will be copied to the chosen destination.



LAYERS PAGE

OVERVIEW

The Layers Page contains tools for controlling the sound characteristics of a layer. Here is where you'll select the keymap (samples) to be used by the layer and where you can apply many common (and not so common) synthesis techniques to shape the layer's tone.

You can also add expressive characteristics to the patch in the Layers Page. For example, you can add vibrato to the decay of a patch to simulate the natural vibrato of a real instrument. You

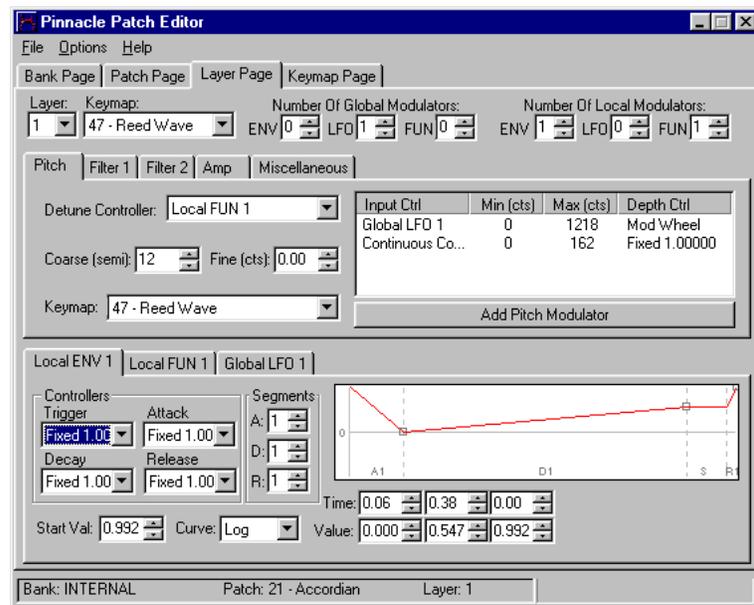
can also apply filters to simulate the brightness in the attack of a real instrument and the gradual fall off of high end as the instrument decays. Of course, you can also use these parameters to create original sounds such as wild filter sweeps or pitch modulations.

The Pinnacle Patch Editor is extremely flexible. Most of the synthesizer's parameters can be controlled via one or more controllers, allowing you to create very expressive patches. For example, the vibrato mentioned earlier can be controlled by an envelop which would "turn on" the vibrato after a certain amount of decay. However, this vibrato can also be controlled by keyboard after-touch control, allowing you to add vibrato at any point during the performance by pressing harder on the keys.

The Layers Page is organized in the following manner: There are four synthesis module tabs: Pitch, Filter 1, Filter 2 and Amplitude adjustment. In addition, a fifth tab titled Miscellaneous offers a number of additional controls.

Each synthesis module can be controlled by one or more modulators. There are many types of modulators. The basic MIDI modulators are velocity, note number, and MIDI controllers. There are also more complicated modulators that change over time on their own, or in response to other controllers. These types of modulators include low frequency oscillators, envelopes, and function generators.

A layer can have up to 24 modulators total, 8 global and 16 local. The **Number of Modulators** setting at the top right determines the number of each modulator type. As you increase the value of each control type, a tab appears in the modulator section at the lower half of the screen. For example, you can have two envelopes, and three LFO's for one layer, and zero envelopes and one LFO for another.



GLOBAL CONTROLS:

LAYER

Displays and selects the current layer to edit.

KEYMAP

Displays and selects the keymap to be used by the layer.

NUMBER OF MODULATORS

Sets the number of modulators used for the current layer. As each modulator type is increased a tab for the modulators controls appears at the lower half of the screen. There are three types of modulators:

ENV – Envelope

LFO – Low Frequency Oscillator

FUN – Function Generator

PITCH MODULE

The pitch module modifies the pitch of the layer. Here are a few examples of uses for the Pitch Module:

- Use the Fine tune control to slightly detune a layer. This is useful for creating a thick analog sound with two similar layers--slightly out of tune with each other.
- Use the Coarse tuning control to create a dual layer patch which plays the root and fifth above it for a multi-voice effect.
- Assign an LFO as a pitch controller to create a light vibrato effect or slow down the LFO and increase the Max depth setting to create a Siren effect.

DETUNE CONTROLLER

Sets the controller for modifying the pitch by fine increments (+/- 6Hz). This could be anything from key velocity to the local LFO modulator. See the Controllers section for a description of available controllers. This is useful for easily creating chorus effects or to fatten up a layered patch. For example you could create two identical layers of a brass patch. Then assign an LFO to each layer's detune Controller parameter and set them to different speeds. This would produce a fat chorusing effect.

COARSE (SEMI)

Coarse tunes the layer by semi-tones.



FINE (CTS)

Fine-tunes the layer by cents.

MODULATOR LIST

Displays the modulators assigned to the pitch module along with the controller's depth range. To assign or modify a pitch modulator double-click on it. This will display the parameters for editing.

Input Ctrl Allows you to choose the input controller.

Min (cts) Sets the Minimum value of the pitch modulation range.

Max (cts) Sets the Maximum value of the pitch modulation range.

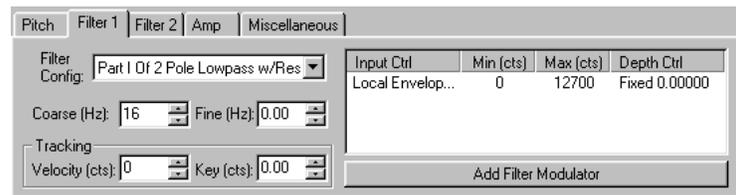
Depth Ctrl Sets the value of the Max parameter via a controller. For example, if you set the Input Ctrl to an LFO, this would create a vibrato effect. You could then control the depth of the vibrato by another controller such as Key Velocity. The Key Velocity would control the value of the Max range setting, so the net effect would be a deeper vibrato on loud notes and a softer vibrato on softer notes.

ADD PITCH MODULATOR BUTTON

Adds another item to the Modulator List. Use this to add another modulator to the list. Use the delete key to delete a modulator from the list.

FILTER MODULES (1&2)

There are two filters for controlling "tone". Each filter has a number of filter types.



THE FOLLOWING FILTER TYPES ARE AVAILABLE:

Null Filter	Filter off.
Single Pole Lowpass	
Single Pole Highpass	
Part 1 of Single Pole Lowpass w/Res	Implements the first half of a 2-pole lowpass w/ resonance.
Part 2 of Single Pole Lowpass w/Res	Implements the second half of 2-Pole filter with resonance.
Add Sawtooth	Adds a sawtooth of a specified frequency to sampled oscillator.

Add Sine	Adds a sine wave of specified frequency to sampled oscillator.
Non-linear Distortion	Controls a non-linear distortion function to oscillator. This is great for adding a little clipping. For example, you can use this feature with a sine wave sample to simulate a Wurlitzer piano sound.

FILTER SETTINGS

Filter Settings are interpreted differently based on the filter type.

The Single Pole Lowpass, Highpass, Part 1 Single Pole Lowpass, Add Sine and Add Saw interpret the controls as follows:

Coarse	Filter adjust in Hz. The frequency range is 16 Hz to 25 kHz.
Fine	Filter adjust in Hz. The values are -100 - +100 in Hz.
Velocity	Velocity tracking. Indicates the max amount of filter to add based on cents.
Key	Key tracking adjustment in 4 bent increments. This is mono-directional. That is it just adds to the filter cutoff.

FOR THE PART 2 OF SINGLE POLE LOWPASS W/RES FILTER TYPE, THE FIELDS ARE INTERPRETED AS FOLLOWS:

Coarse	Filter Adjust – Resonance in DB (between -12 and + 18)
Fine	Filter Adjust – resonance in 256th of a DB.
Key and Velocity tracking	Resonance in DB/per key. from -2.0 to +2.0 per unit velocity or key.

FOR NON-LINEAR DISTORTION FILTER TYPE, THE FIELDS ARE INTERPRETED AS FOLLOWS:

Coarse	Filter adjust "distortion " between 1.0 and -1.0.
Fine	Ignored.
Key and Velocity tracking	Viewed as fractions per key with each having a range of +2 to -2.



MODULATOR LIST

This list box displays the modulators assigned to the filter module along with the controller's depth range. To assign or modify a filter modulator double-click on it. This will display the parameters for editing.

Input Ctrl	Allows you to choose the input controller.
Min (cts)	Sets the Minimum value of the filter modulation range.
Max (cts)	Sets the Maximum value of the filter modulation range.
Depth Ctrl	Sets the value of the Max parameter via a controller.

ADD PITCH MODULATOR BUTTON

Adds another item to the Modulator List. Use this to add another modulator to the list.

ABOUT KEY TRACKING

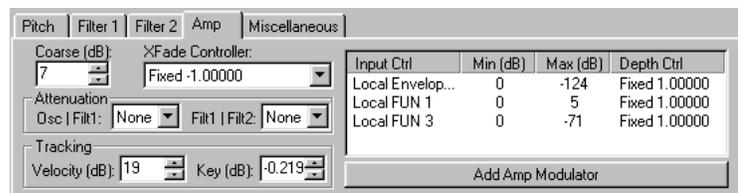
Key tracking allows you to change the default way a key's filter behaves as you play higher keys. For example, a value other than 0 typically affects the filter cutoff frequency as you play different notes. Negative values cause the cutoff frequency to decrease as you play higher notes. Higher values, of course, cause the cutoff frequency to increase as you play higher notes. Regardless of the key tracking, middle C will always play using the defined filter values as it is the zero point.

ABOUT VELOCITY TRACKING

Like Key Tracking, this parameter allows you to change the default shift of filter cutoff, only here the change is affected by the attack velocity. Positive values cause the filter cutoff frequency to shift to a higher frequency when a stronger velocity is received; negative values lower the cutoff frequency.

AMP MODULE

The Amp module is used to control the Amplitude, or volume level.



COARSE (DB)

Overall volume adjustment for layer. 0 is unity gain. This reflects the fader setting in the Patch Page if you consider the center of the fader 0.

XFADE CONTROLLER

Allows a cross fade between two sources. To use this, you assign a modulator (controller) here and then you assign the inverse of that modulator to another layer in the same patch and now you can Xfade between layers.

ATTENUATION

- OSC / Filt 1
- Filt 1 / Filt 2

TRACKING

VELOCITY (DB)

Offsets amplitude based on Velocity .

KEY (DB)

Reduces amplitude as you go up the scale.

MODULATOR LIST

This list box displays the modulators assigned to the amplitude module along with the controller's depth range. To assign or modify a modulator double-click on it. This will display the parameters for editing.

- Input Ctrl** Allows you to choose the input controller.
- Min (cts)** Sets the Minimum value of the filter modulation range.
- Max (cts)** Sets the Maximum value of the filter modulation range.
- Depth Ctrl** Sets the value of the Max parameter via a controller.

ADD PITCH MODULATOR BUTTON

Adds another item to the Modulator List. Use this to add another modulator to the list. Press the delete key to remove a modulator from the list.

MISCELLANEOUS TAB MODULE

IGNORE NOTE OFF

Ignoring note off messages will allow the note to decay naturally. This is especially useful for drums.



XFADE SENSE

If set, then interpret the Xfade control inverted.

NATURAL ENVELOPE ON

Typically you **MUST** use this. It tells the synth to use the envelope defined for each sample used in that layer. Without it, the synth doesn't know how to end the sample. This parameter and Ignore Note Off are similar.

NOISE ON

Use white noise generator instead of sample.

PAN

Fixed - Sets layer to normal pan mode.

Auto - Automatically pans layer according to notes played on the keyboard. Lower notes get panned more to the left, higher notes to the right.

Reverse Auto - This is the same as Auto only the lower notes are panned right and the higher to the left.

TIMBRE SHIFT

Alters the timbre quality of the layer.

LAYER DELAY (MS)

Delays the layer from triggering in milliseconds. Use this to create echo effects or sequenced patches.

EXCLUSIVE ZONE

If the Exclusive Zone is non-zero then all other currently running notes on that channel with the same exclusive zone are stopped before this note is started. This is primarily useful for percussion.

Exclusive zones are available to allow for one note or sound to stop the playing of another sound, as is typically the case with hi-hat cymbals. To set up an exclusive zone, you must go to the 'Miscellaneous' page in the 'Layer Page', and set the exclusive zone value to a value that is **NON-ZERO** and **IS EQUAL** to the value of the layer that you wish to shut off when the current layer is played. Now select the other layer from the layer drop list and make sure that it's exclusive zone is the same as the one you just set and you're ready to go.

If you are adding samples to the GM drum patch (130), you have to be careful of pre-existing exclusive zones. In the GM drum patch, there are 29 different layers that facilitate various panning settings and exclusive zones. If you upload a sample to a layer and that layer happens to have a non-zero exclusive zone setting, chances are that it will be cut-off by another layer. The point here is, when you upload a sample to a GM drum layer, be sure you check the exclusive zone setting and make sure it's zero.



TIMBRE SHIFT

This parameter in the layer page calls for experimentation. Timbre shifting changes a note's timbre by imposing different harmonic qualities on the note. Positive values tend to brighten, negative values darken. Essentially what happens is, if you shift up by a value of 4 and play a G4, the pitch played will be G4, but the engine will actually play the Eb4 pitch shifted up to G4.

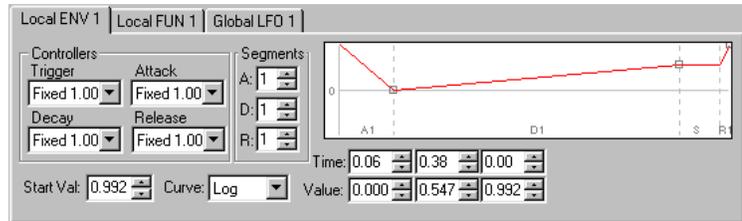


MODULATORS AND CONTROLLERS

ENV MODULATOR TAB

The number of ENV tabs is controlled by the "Number of Modulators – ENV" control.

An envelope modulator provides a preset change in values over a given period of time. Typically, an envelope would be used to control the amplitude of a sound over time. For example, if your sample was a looped sine wave, you could simulate a Rhodes piano sound by modulating the Amp module with an envelope. The envelope would be set with a loud, immediate attack, and a three or four second decay.



Envelopes typically have three segment types. Each segment responds to the action of the MIDI note that triggered it.

- | | | |
|-----------|---------|--|
| Segment 1 | Attack | The segment that runs when the key is pressed, Note On. |
| Segment 2 | Decay | The segment that runs while the note is being held. |
| Segment 3 | Release | The segment that runs when it gets the Note Off message. |

The Kurzweil MA-1 synth allows a total of six segments: Two Attacks, Two Decays, and two Releases.

Each segment of the envelope can have its rate controlled by a controller. For example you could set the Attack rate to be controlled by the key velocity. This would produce a faster attack for loud performances and a slower attack for softer performances. This would be a good setting for a woodwind instrument such as a flute where a gradual attack would be desirable for soft notes and a sharp attack for loud notes.

CONTROLLERS

TRIGGER

Sets the controller that will trigger the sample. The envelope does not begin until the Trigger value goes above 0.5. Typically this should be set to Fixed 1.0.

ATTACK

Sets the controller that will modify the Attack Rate.

DECAY

Sets the controller that will modify the Decay Rate.

RELEASE

Sets the controller which will modify the Release Rate

SEGMENTS:

Sets the number of envelope segments. There can be up to two of each, but no less than one of each.

- A** Attack
- D** Decay
- R** Release

START VALUE

Sets the Value of the start of the envelope at trigger time.

CURVE

Sets the envelope attack segment to follow a linear or logarithmic curve. Note that it will only be audible (and visible) in fairly long segments.

ENVELOPE SETTINGS

The number of envelope Time and Value settings is determined by the Segments controls.

TIME

Adjusts the length of each segment in seconds.

VALUE

Adjusts the value of the segment. It can be thought of as a destination ratio value with range -1.0 - +1.0

MORE DEFINITION ON ENVELOPES

The local layer envelope provides you with a way to set up gradual changes based on key down status or other trigger information. You can use layer envelopes for anything you would use a modulator for: amplitude, filter frequency, pitch, modulator depth, LFO rate, etc.

NOTE

Be sure to disable the 'Natural Envelope On' box in the Miscellaneous page if you want to use a Local Envelope for Layer amplitude. If not, the envelope will have no effect on the amp module.

The MA-1 envelope generator is a very powerful one. The envelope consists of a user definable number of segments maxing out at 16 (up to 8 attack, 4 decay, 4 release segments).



Typically, an envelope will be put into action thru key down status. For instance, a key down signals the envelope generator to go into attack mode. If the key is still down after the duration specified by the A1 attack segment it goes into the A2 attack segment, if it exists. If the key is still down after all of the attack segments have been passed thru it goes thru the decay segments. If the key is still down it is considered sustaining and maintains the level of the last decay segment. When the key is lifted, the first release segment is used to dictate the value to be used. If more release segments exist, they are used until the sound is inaudible or it reaches the end of all release segments. If the sample is a short one and you want a long release, you will typically need to loop the sample.

The MA-1 allows you to modify these segments in several ways. There are four controller drop lists in each envelope page. The first, the Trigger control, lets the MA-1 know when to start the envelope generation. When this value is above 0.5, the envelope begins. Typically this is mapped to a fixed 1.0 and thus the envelope starts at key down time. You could map this to a continuous controller and it would allow you to hold down a key and decide for yourself when to start the envelope. This makes much more sense when you think of the envelope being applied to a pitch or filter module where you can make the patch do strange but predictable things once the envelope is initiated.

The other controllers are used to modify the rates of the envelope sections. Here's how it works: All controllers get mapped to a value between -1.0 and 1.0 if they are bi-polar (positive and negative range) or 0 and 1.0 if they are uni-polar (always positive). All MIDI controllers are going to be uni-polar. The current value for the controller can be used to scale the rate of the envelope segment it is mapped to. Essentially, it's like this: when you map a control source to an Attack/Decay/Release rate, the lower the controller value is, the faster the rate will be (and the segment will be shorter). For instance, if you make a long attack segment and map the Mod Wheel to the attack rate, when the mod wheel is pulled back (to its zero position), the attack segment will be very short and possibly inaudible. When you move the mod wheel to its fully open position, the attack segment will be very long.

LFO MODULATOR TAB

The number of LFO controls is controlled by the "Number of Modulators – LFO" setting.

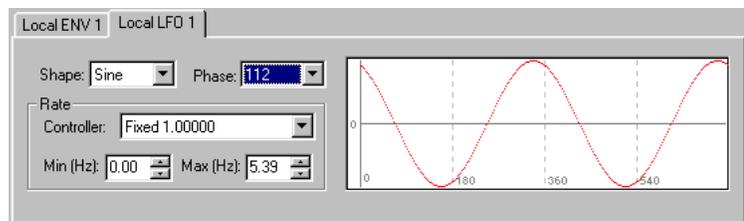
LFO's or Low Frequency Oscillators provide a repeating signal for controlling the Pitch, Filter and Amplitude modules. For example, an LFO can be set to control the Amplitude module's level to create a rotating speaker effect on an organ patch. Or, an LFO could be assigned to the Pitch module to create a vibrato effect.

SHAPE

There are four LFO shapes; Sine, Square, Ramp and Triangle,

PHASE

This control allows you to offset the LFO to change its phase. This is useful for adjusting how the LFO is affecting the signal when the sample is started. Or, when you would like two LFO's running at the same rate simultaneously and you don't want them perfectly synched together.



RATE

CONTROLLER

Let's you set the rate via an external controller such as an envelope or the modulation wheel.

MIN (HZ)

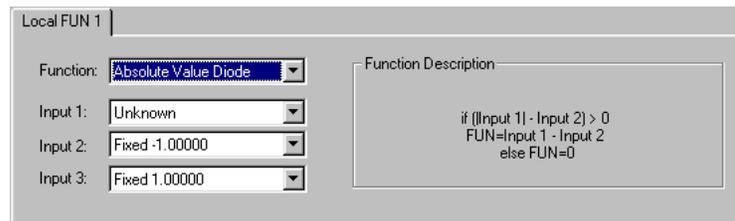
Sets the minimum rate when modified by a controller. Also fine-tunes the rate when the controller is set to a fixed value.

MAX (HZ)

Sets the maximum rate when modified by a controller. Also fine-tunes the rate when the controller is set to a fixed value.

FUN MODULATOR TAB

FUN is short for function generator. FUNs are an extension of the FUNs found in the Kurzweil K2000 engine. Simply put, FUNs take inputs, perform a defined function on those inputs, and produce an output. Inputs are controllers.



FUNCTION

Displays a drop down list box containing the following functions:

- Sum** Input 1 + Input 2 + Input 3
- Sum Scale** (Input 1 + Input 2) * Input 3
- Diff Scale** (Input 1 - Input 2) * Input 3
- Scale 3 Add** Input 1 + (Input 2 * Input 3)
- Scale 3 Diff** Input 1 - (Input 2 * Input 3)
- Multiply 3** Input 1 * (Input 2 << 8) * Input 3
- Subtract 3** Input 1 - Input 2 - Input 3
- In Range** If (Input 1 >= Input 2) && (Input 1 <= Input 3) FUN = 1 else Fun = 0
- Scale** Scale Input 1 between Input 2 and Input 3



Diode	If (Input 1 – Input 2) > 0 FUN = Input 1 – Input 2 else FUN = 0
Track	If (Input 2 > 0) Fun = 1 else FUN = 0
Sample & Hold	If (Input 2 < HALFCTRL) FUN = Input 1 else FUN = LASTVAL
Lowpass	Lowpass all controllers, filters out fast changes.
Highpass	Highpass all controllers, filters out slow changes.
Quantize	Quantize Input 1 into Input 2 steps.
Absolute Value	If (Input 1 -Input 2) > 0 FUN = Input 1 – Input 2 else FUN = 0
Diode	
Cosine	Cos(Input 1)
And	Input 1 & Input 2 & Input 3 (as switches)
Or	Input 1 Input 2 Input 3 (as switches)
Limit	Limit Input 1 between Input 2 and Input 3
Max FUN	Maximum of Input 1 and Input 2
Min FUN	Minimum of Input 1 and Input 2

INPUT 1, 2 AND 3

Lets you assign a controller to the input.

CONTROLLERS

Controllers provide values to the various operations within the editor. There are seven categories of controllers, each containing a variety of controllers

MIDI CONTINUOUS CONTROLLERS

The MA-1 provides for the use of the first 16 MIDI continuous controllers as control sources. The controller values themselves range from 0 to 127. The MA-1 scales these values to fall between 0 and 1 when used as control sources.

MIDI SWITCHES

The four MIDI controllers typically used as switches can be used as control sources: Damper (Sustain) Pedal, Portamento, Sostunato and Soft Pedal. The value of the controller is mapped to either a 0 or 1. For instance, if the damper is depressed, the control source is switched to 1. When it is released, the control source switches to 0.



LFOs

Low Frequency Oscillators (LFOs) can be used for a wide variety of purposes in the MA-1. The typical uses are to generate pitch modulation to give a chorus or detuning effect or to generate amplitude modulation giving a techno sounding pulse to a sound.

ENVELOPES

On most synths, envelopes are used to change the amplitude attack, decay and release characteristics. This allows you to make a sound fade in, play abruptly, get louder/softer the longer you sustain it, or let it fade out after you lift the key. On the MA-1, envelopes can be used for anything you may want to modulate, including pitch, filter cutoff frequencies, amplitude, among many other things.

FUN

Sometimes you may wish to combine multiple control inputs to control a modulator in a new way. Function Generators, or FUNs, allow you to do this. To use a FUN, you select 2 or 3 control sources you wish to use together and select the mathematical FUN equation to be used to determine the control value to be used. The output of a FUN will be clipped at -1.0 on the low side and 1.0 on the high side.

FIXED VALUES

OK, so they're not really modulators since they're fixed, but they can be applied in the same way as modulators and it's convenient to group them this way. You will want to use fixed values on occasion to apply to depth controls when you don't want the depth to vary or as comparators in FUNs. The fixed values are just what they appear to be: fixed scalars. If you use a fixed scalar of 0.5 on a depth control set to reach a max of 8 dB then the depth will only reach a max of $(0.5 * 8 \text{ dB})$ or 4 dB.

LOCAL RAW CONTROLLERS

- Note Number - a control source generated each time a MIDI note is played, scaled from 0 through 127 to between 0 and 1.
 - Attack Velocity - this control source scales all incoming attack velocity values from 0 through 127 to 0 through 1.
 - Attack Bi-Velocity - this is the same as Attack Velocity except that the values from 0 through 127 are scaled between -1 and 1.
 - Note State - this control source is either 0 or 1. This value switches to 1 when a note is started. If the note is held down or the sustain pedal is depressed, the value remains one. As soon as the pedal is released, the value switches to 0, even if the note has a long release.
 - Key State - this control source switches to 1 when a key is pressed and to 0 when the key is released, regardless of the sustain pedal status.
 - Loop State - the Loop State control switches to 1 when the currently playing sample reaches its loop start point.
 - Playback Rate - a sample's playback rate is determined by the amount of transposition from the root key. The value of this source control can be thought of as a scaled representation of the
-



playback rate across the keyboard. At the root key, this value is 0. At the lowest possible note, the value is -1. At the highest possible note (the 96 kHz note), the value is 1.

- Inverse Attack Velocity - this is the opposite of Attack Velocity, scaling the controller values from 0 to 127 to 1 to 0; a controller value of 0 will yield a control source value of 1 and a controller value of 127 will yield a control source of 0.
- Release Velocity - incoming release velocity is scaled from 0 to 127 to between 0 and 1.
- Attack State - each time a note is started this control source switches to 1 and then switches quickly back to 0.
- Release State - each time a note is released this control switches to 1 and remains at 1 until the note finishes its release (fades to silence) when it switches back to 0.

GLOBAL RAW CONTROLLERS -

- Mono Pressure - MIDI Mono pressure scaled between 0 and +1.
- Current Key - number of the most recent note started on the owner MIDI channel, scaled between 0 and 1.
- Current Velocity - velocity of the most recent note started on the owner MIDI channel, scaled between 0 and 1.
- Channel Count - the number of voice channels currently playing on the owner MIDI channel scaled between 0 and 1. The actual number will range from 0 to 32.
- Channel State - the channel state control source is a switch. The channel state switches to 1 whenever a note is started on the owner MIDI channel. Anytime a note off is received on the owner MIDI channel, the channel state switches to 0.
- Hi Key - the number of the highest key of all active notes on the owner MIDI channel, scaled between 0 and 1.
- Lo Key - the number of the lowest key of all active notes on the owner MIDI channel, scaled between 0 and 1.

GLOBAL VS. LOCAL MODULATORS

The MA-1 differentiates between Local and Global modulators (LFOs, Envelopes, and FUNs). The two modulators are available so that you can use one global modulator to affect all layers (like for pitch modulation from the mod wheel) or you can set up local modulators to affect each layer differently (maybe setup a controller that increases the amplitude of one layer while decreasing the amplitude of another).

There are a couple of things to keep in mind. First of all, do not use global envelopes for amplitude modulation. Use local envelopes on a per-layer basis. Global modulators are instantiated at patch change time so the global envelopes are relatively worthless. The global FUNs and LFOs are of course plenty useful on the other hand. If you're want to sync LFO or FUN based modulation on two layers, by all means use global LFOs or FUNs. You'll use half the patch RAM and get perfect sync.

You can create the Global modulator in any layer and it will automatically show up in all layers of that patch.

SETTING DEPTH VALUES FOR MODULATORS

When you attach a FUN, LFO or ENV modulator to an Amp, Filter or Pitch module, be it a global or local modulator, you can also apply a depth controller. If your depth controller actually varies, the depth Min and Max values come into play and set the range that the modulation will span. If, however you use a fixed value in the depth control field, the Max Depth fields let you center the modulation. The Min setting is not used with a Fixed Depth Control value. With an LFO for instance, let's say you apply a fixed 1.00 depth control with a max depth of 10 dB in the Amp module. The signal will now be modulated between +10 dB and -10 dB from unity gain.

When you use a true modulator on the depth, the depth will vary between the minimum and maximum depth settings. A typical application of this feature would be to assign Key Pressure to the Depth Controller. This would create a more intense vibrato when key pressure was applied.

When you apply a Fixed Value to the depth controller, you are essentially moving the center point of the depth modulation. As you approach a fixed value of 0.0, you bias the depth toward the Min Depth value. If you go the other way and set the Fixed Value to 1.0, you bias toward the Max Depth. Mathematically, it looks something like this:

$$\text{depth value} = ((\text{fixed} - 0.0) * \text{max depth}) + ((1.0 - \text{fixed}) * \text{min depth})$$



KEYMAP PAGE

OVERVIEW

The keymap page provides tools for creating a sample keymap. A keymap is a table stored in the patch which determines which samples are included in the patch and the keyboard range assigned to each sample.

A keymap can be used in any number of patches. Different patches can share a keymap.

There are three sections in the keymap page. At the top left is the sample list. This is the list of ROM and RAM samples in the current keymap.

To the right of the sample list is the keymap display. This window provides a graphic representation where each sample is mapped on the keyboard. Each horizontal bar represents a sample. The width of the bar represents the keyboard range the sample is triggered by.

Below the sample list and keymap window are the sample parameters. These settings let you adjust a number of attributes for the sample currently highlighted in the sample list.

Keymaps are saved along with the Bank. It is not necessary to save a keymap as a file.

CURRENT KEYMAP

Shows the current keymap. This list shows the keymaps currently in the synth ROM as well as user definable keymaps. New keymaps can be created by pressing the New button. Keymaps can be removed from the list by pressing the Delete button. Note that default keymaps stored in RAM will always be restored when the synth is rebooted.

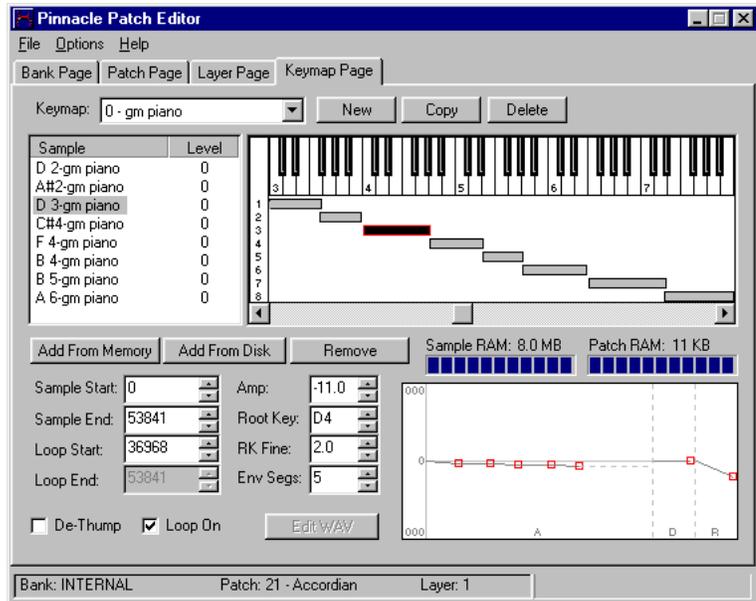
Right clicking on the keymap control will display a menu for renaming the current keymap and for displaying current keymap data.

SAMPLE LIST SECTION

The sample list displays the samples included in the current keymap. Each sample includes a level offset. Clicking on this parameter will display an editable spin control for changing the values. Use the Level control to adjust the relative volumes between samples.

You can address 128 samples per keymap.

RIGHT CLICK MENU



Right clicking on a sample will display a menu with two sample related items:

Rename Sample Header - For renaming the sample object in the synth database. Note that this is not the actual WAV file name, but the name the synthesizer uses in its internal database.

Show Sample Header Data - This displays the current settings associated with the sample.

ADDING AND REMOVING SAMPLES FROM THE LIST

Keymaps can be made from internal ROM samples as well as WAV files stored on your hard disk. Samples can be added and removed from the list using the buttons described below. When a new sample is added to the list, it is inserted before the currently highlighted sample. Note that samples should be inserted into the list in the order they will appear on the keyboard from left to right. For example, lower pitched samples should come before higher pitched samples in the list.

Add from Memory Button – Displays a list of all samples in the synthesizers internal ROM. These are the samples that make up the default General MIDI sound palette in the Pinnacle. These samples can be used to create custom keymaps. Using these samples won't affect the default General MIDI palette as long as you don't delete any of the default keymaps. The default keymaps can be restored by pressing the Reset button on the Bank Page in the event that they are deleted.

Add from Disk Button – Displays a dialog for selecting custom made WAV files to use as samples in a keymap.

Note that the patch will remember the path of the WAV file on your disk. If you move the file to a different location the editor will not be able to find it when you reload the bank. It's a good idea to keep all WAV files for a given bank in the same directory.

Remove Button – Removes the current sample from the list.

KEYMAP DISPLAY

The keymap display indicates the keyboard pitch range for each sample. As new samples are added to the Sample List the keymap display adds a new bar, below the keyboard, indicating the keys which would trigger the current sample.

Notice that there is a highlighted bar. This is associated with the currently highlighted sample in the Sample List. The current sample can be changed by clicking on a new bar or a new sample.

The sample range can be modified by dragging the left-hand side of the bar. Note that the bar above it will shorten to accommodate the new range.

Move the mouse over the left hand side of the bar. The cursor will change to a right-left arrow. Click and drag the bar to the desired range.

The keyboard display works as an audition keyboard. This allows you to hear the samples as they are transposed to the keyboard. This is helpful for tweaking the sample range.

SAMPLE HEADER PARAMETERS

When a sample is added to the keymap list, it's loop and root key information is loaded into the editor. This information can now be edited as necessary. For example, you can change the loop points or the



root key number. This information will be saved with the keymap, not the WAV file. Note that these are all non-destructive commands. For example, modifying the Sample Start time will not truncate the sample.

Note all loop values are in "Samples".

SAMPLE START

The point at which the sample starts playing. Use this to remove any unwanted attack portions of the sample.

SAMPLE END

When playback of the sample stops or loops. Note that this is not necessarily the end of the sample data. If the sample is longer than the current Sample End time, you can increase the Sample End to make the sample playback longer. Note that the Sample End is equivalent to the Loop End.

SAMPLE START AND END POINTS AND LOOP START AND END POINTS

Each Sample Header contains Sample Start and End points and a Loop Start point. The MA-1 synth does not allow you to set a Loop End point that is not equal to the Sample End. In the Keymap Page, you are shown a Loop End point just for the clarity of seeing the loop points as a pair. When you change the Sample End, the Loop End is changed as well.

Sample Start and Sample End values are typically the first and last samples of the Wave that has been uploaded but they do not have to be. This can be especially handy when working with aliases.

LOOP START

The start point of the loop when the loop repeats.

LOOP END

This is a static control and cannot be edited. This parameter is equivalent to the Sample End time. To adjust the Loop End, modify the Sample End time.

LOOP ON

Turns the loop function on or off.

DE-THUMP

This is used to remove the first 2ms of a sample if it thumps at the very beginning

AMP

This is a gain adjustment for the sample which is used anytime the sample is played. Note that this differs from the Level adjustment in the Sample List, which only affects the sample when it's in that particular keymap.

ROOT KEY

Sets the root key reference for transposition of the sample. For example, if you record a violin playing middle C at a sample rate of 44k, you need to tell the synthesizer which note on the keyboard will play the sample at 44k. This will keep the actual pitch aligned with the appropriate key.

EDIT WAVE BUTTON

Launches the default Wave Editor with the current sample loaded. Note that ROM based samples cannot be edited, therefore the button will be grayed out for these samples. The default Wave Editor can be set in the Wave tab of the Preferences dialog located under the Options menu.

GRAPHICAL AMP ENVELOPE

The Graphic Envelope display allows you to more easily edit the sample specific amplitude decay envelope. Please see "Creating Sample Specific Envelopes" below for more information.

The Graphical Envelope is On by default, but can be turned off to display the Time and Slope settings for each segment in the envelope. Do this by selecting "Graphical Envelopes" from the Options menu.

You can adjust the vertical dB scale of the envelope by left clicking on the scale in the display.

ENV SEGMENTS

Each sample can have it's own amplitude envelope. This is invaluable for creating keymaps with sample that require different amplitude envelopes such as drum samples or complicated multi-samples such as pianos, etc. The Env . Segments parameter lets you set the number of segments the sample's envelope will have. Each time the Env. Segments value is increased two new controls will appear for adjusting that segments Time and Slope.

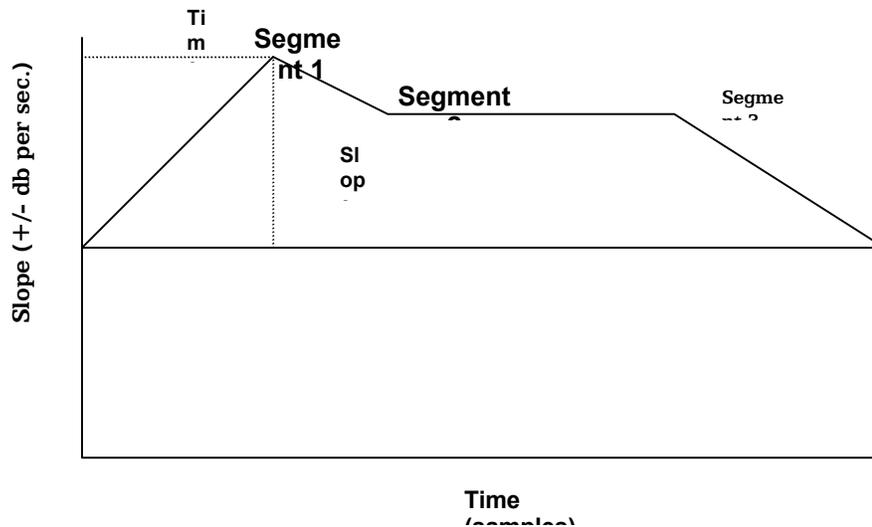
TIME SETTINGS

For each segment a Time setting is provided to set the time position of the segment. Time measured in Samples.



SLOPE SETTINGS

For each segment a Slope setting is provided to set the slope position of the segment, allowing you to set how quickly the amp envelope will increase or decrease in volume. Slope is measured in dBs per Second.



CREATING SAMPLE SPECIFIC AMPLITUDE ENVELOPES

The envelope shown in the Keymap Page is available to fine tune a sample's amplitude. To effectively use this feature, you should know its intended purposes. The sample envelope can be used most effectively to match decay levels. You cannot effectively set up attack envelopes with the sample envelope since it can only begin at unity gain. Use this envelope to cut off a sample after a particular duration or to match decay curves with other samples in a shared keymap. You can also create differing decay patterns on the same sample data if you create a sample alias. For example, using the same cymbal sample you could make a choked cymbal sound and a long cymbal sound using the Keymap envelope.

There are two display modes for modifying the Keymap Envelope parameters; Graphical and Numeric. You can toggle between these two modes by selecting "Graphical Envelopes" from the Options menu.

If you look at the envelope data in the non-graphical mode you'll see two values: a time (duration) and a slope. These values are shown in samples for duration and in dB/sec for slope. When you drag the envelope to a point in the graphical mode, sometimes you'll see it jump to a position slightly different from where you let up on the mouse. This is either because you have exceeded the maximum slope that the engine can recreate or you have exceeded the maximum duration of 64000 samples for any one segment in the sample envelope.

The Decay and Release segments of the envelope only use one parameter. This value modifies the slope of the decay or release. You may want to adjust the scale of the graphical envelope to allow a greater effective range. Do this by clicking on the scale at the left of the graphical display.

If you are having trouble seeing the use of such an envelope, bring up the acoustic piano patch and click on each sample in the basic piano keymap while checking out the envelope for each one.

If you need to create attack segments, the place to do it is in a Local Envelope and map the envelope to the layer's amp section in the Layer Page.

HOW SAMPLE DATA IS TRANSFERRED TO THE MA-1

When you transfer a sample to the MA-1, it is sent thru the Pinnacle MIDI driver the same way that patch data or even MIDI sequences are sent. However, the data is transferred at a much higher rate than the standard MIDI baud rate. You will notice that although the rate is much faster than a MIDI sample dump, it still is not incredibly fast during very large sample dumps or during continuous dumps of samples as is the case during a bank load. The reason for this is that the synth's controller needs time to get the actual sample bytes and arrange them in RAM. In addition, when multiple samples are sent, the synth requires a short delay time so that it can prepare to receive the next incoming message.

Also of note regarding sample data transfers, the actual sample data is sent in eight bit bytes which is very non-standard MIDI sysex. This was done to ensure that the transfer itself was as fast as possible. All other data sent to the MA-1 is sent in the traditional 7 bit-sized sysex format.

USING ALIASES TO MINIMIZE UPLOAD TIME

Aliases are just new sample headers referencing samples that have already been uploaded. Let's say you upload a 4 bar drum loop into the synth. The synth puts this in slot 330 and you call it '4 bar loop.' Now you want to create a sample that uses the same loop but is only one bar with the beat turned around so that the snare is on one and the kick is on two. You can do this without uploading another sample using an alias. Click on the '4 bar loop' sample in the keymap and then click on 'Add Alias'. In the dialog box make sure that '4 bar loop' is the linked sample and that an empty slot is the base sample. Name the alias something like '1 bar turnaround'. When you click OK, you will have a new sample header that references the same sample data as '4 bar loop' that you can change without changing the original. For instance, now you can click on '1 bar turnaround' and move sample start ahead one beat and change sample end to be exactly 4 beats from there. Now you have your 1 bar turnaround without adding sample data.

That's nice and all but the way to improve your life using aliases is a little tricky and will be time-consuming at first but save you minutes of download time each time you use your banks if you do it right. The idea is this: The MA-1 requires delays in between sample downloads to give it time to manage incoming data. If you have one 3 Meg file to upload it will take about 15 seconds; if you have 60 files that consume 3 Megs of data, it will take about 1.5 minutes to upload. Aliasing allows you to do the former (saving years of your life), as long as they are of the same sample rate and resolution.

HERE'S WHAT YOU DO:

1. Gather all of the WAV files you want to use in a bank.
 2. Load the first one into your favorite editor.
 3. Make note of the SAMPLE VALUE of the last sample. (ie., what is the length of the WAV in samples); this will be the sample end of the first sample AND sample start of the second.
 4. Open the next WAV in another window; select the entire WAV; copy it; paste it at the end of the first sample (concatenate the WAV file).
 5. Make note of the new length; this will be sample end of the second sample AND sample start of the third.
 6. Repeat for all similar samples.
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7. Now, load that WAV into a new keymap from the keymap page. Call it 'All Wavs' or something like that.
8. Click on 'All Wavs' and then click on Add Alias.
9. For the first Wav, make sure that 'All Wavs' is the linked sample and an empty slot is the base alias sample. Name it 'First Wav' or something that actually describes it.
10. Now, with the alias selected, move the Sample Start point to 0 and Sample End to whatever the first length value that you have noted was.
11. Repeat for all samples in this keymap.
12. You can keep going and do ALL your keymaps from this one WAV if you wish.

This might seem like a lot of work but it will definitely increase your upload time significantly. If you plan to use your banks frequently, this method is highly recommended. The other benefit is that it keeps all your wavs together in one place for easy portability.

The above procedure is recommended for un-looped samples. If you do this for looped samples, write down the loop start and end offsets (in samples) and add those to the loop start value to get the value you need to set in the Patch Editor. It's a little more work but still worthwhile
