

# “VIENA” SOUNDFONT EDITOR

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## INTRODUCTION

Viena is a free but excellent soundfont editing program written by Kenneth Rundt. It can be downloaded from the following website:

<http://www.synthfont.com>

All my work in making soundfonts for jOrgan dispositions has been done using it. The article which follows describes the various steps I have found to work, and makes no attempt to be comprehensive in its treatment. Viena has many features which I have not explored. I am writing this article to encourage jOrgan users to become familiar with it, not only for the purpose of making their own soundfonts, but perhaps even more importantly, to help them use it to edit the soundfonts of organs they actually use, which others have made, but which need to be adjusted according to their own particular needs and preferences.

## STRUCTURE OF SOUNDFONTS

Soundfonts are made up of three basic elements: Samples, Instruments and Presets.

SAMPLES are the first element to be worked on. They are .wav audio files to which have been added Start and End looping markers. In normal organ use, the sound engine you have will play the file from its actual start through to the looped section, and then will play that section from the Start to the End markers, and do so again and again, until you release the playing key. At the release, the sound engine will add and play a “release” section corresponding to the waveform existing at the time of release, but diminishing in volume at a rate determined by one of the parameters set by the developer or user, within the soundfont, as a normal editing procedure. Alternatively, the sound engine will play a special release sample that exists on a separate .wav file. (Currently I make no use of this special provision, and will not be referring to it subsequently in this first release of this article).

The actual positions of the looping Start and End Markers are of critical importance, for if they are not correctly placed, a click or “tick” will be heard every time the looped section is replayed.

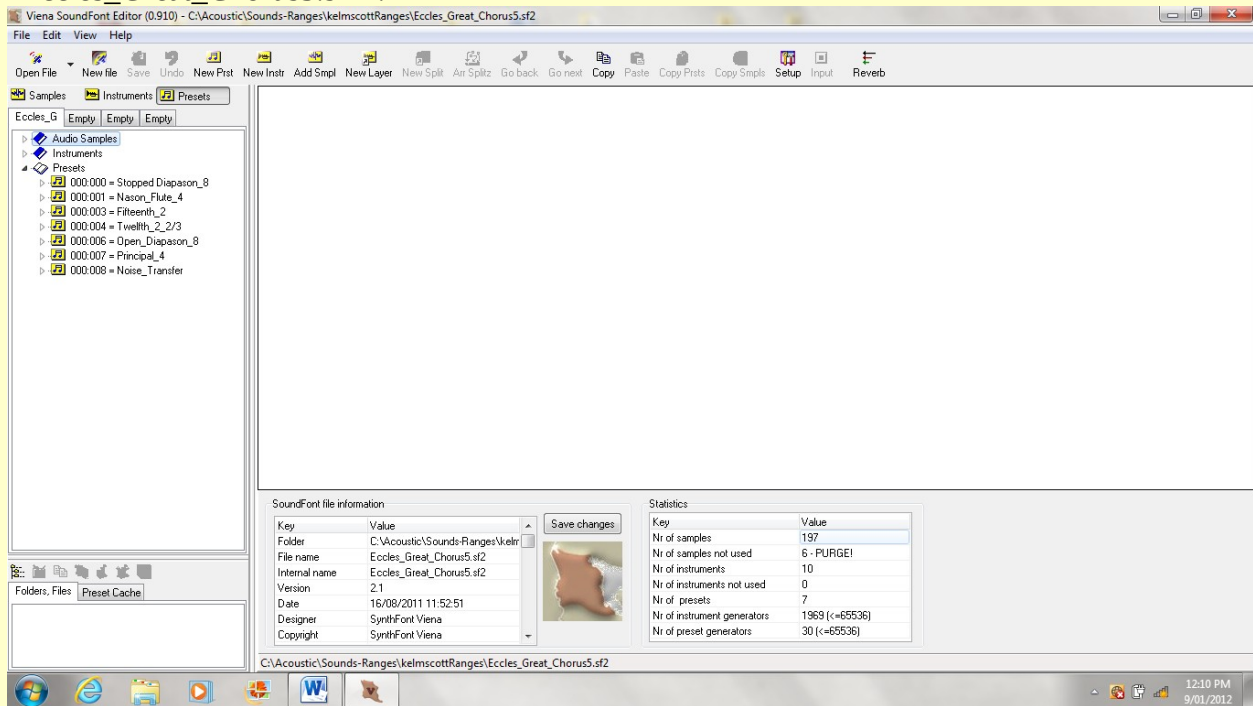
The Sample files may be derived from audio recordings made from playing actual instruments, or they may be synthesized using special programs made for that purpose. The free Klangsynth has been much used in making samples for jOrgan; I prefer a more recent program called AdsynDX (not free, but quite inexpensive, and well worth the cost). These two programs do not add the looping markers, and for this I recommend the free Endless WAV, although Viena itself has an excellent Graphical User Interface which allows you to add the markers manually. However, if the sample is other than completely regular in the area you wish to loop (and my samples tend to be completely regular in that area), then you would be well advised to use a special program.

INSTRUMENTS are the second element “up the ladder”. Each Instrument needs at least one Sample, and to maintain a good quality of sound across the range, it is common in jOrgan designs for each Instrument to be made up of many Samples, even up to one per note. (I draw the line at 30 Samples per Instrument in 8-foot stops of 61 notes, possibly dropping to 15 for stops of lesser importance). An Instrument is structured in a special way, and consists of one or more “splits” (commonly also called “zones”). Each split has assigned to it one Sample. In most cases, if 30 Samples are used in an Instrument, there will be 30 splits. However, there is no hard and fast rule, and it is possible to assign the one Sample to one or more splits. For 61-note ranks of 8-foot pitch, I have settled on using 30 splits in the Instruments, with each two adjacent notes across the range coming from each split, and the top three notes (which I call A#5, B5 and C6 in an 8-foot rank) from the highest split.

PRESETS are the third and “top” element. Each Preset corresponds to a Rank in a jOrgan design, and will usually be named accordingly. A Preset needs at least one Instrument, but will often have two or three or even more. The Various Instruments in a single Preset are sometimes referred to as “levels”.

## SCREENSHOTS

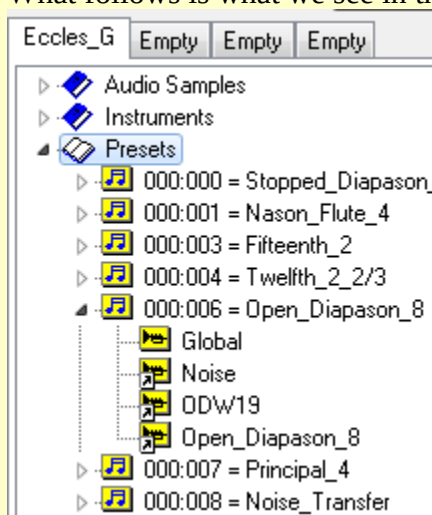
To bring up the main screenshot, I ran Viena in Windows 7 and opened a small soundfont file called, “Eccles\_Great\_Chorus5.sf2”.



Viena has listed the Presets in the window at the left, which I shall call the “Management Window”. The large empty window at the right, I shall call the “View Window”. In the example, there are actually six ranks being used. The seventh Preset, called “Noise Transfer” was used as part of the processing, and it happened that having made use of it, I did not get around to deleting it from the soundfont.

If you double-click on a Preset entry, it will expand to list the Instruments used in that Preset, along with an entry called, “Global”.

What follows is what we see in the Management Window after double-clicking on “Open\_Diapason\_8”.



Note that this Preset has three Instruments: Noise, ODW19, and Open\_Diapason\_8. Noise is used to add some air hiss to the sound of the Preset, ODW19 stands for “Open Diapason Wobble” (the 19 has been added by Viena, and has no particular significance apart from being an identifier), and Open\_Diapason\_8 is the main Instrument.

Note also the use of underscores taking the place of spaces in the Preset and Instrument names. Some sound engines get confused if you use spaces.

If you click on any one of the “Open\_Diapason\_8” Preset list items, the View Window will show you what I shall call the Preset Cells View:

Parameters	Layers: Global	1: Noise	2: ODW19	3: Open_Diapason_8
Key Range		(36-96)	36-96	36-96
Velocity Range				
Attenuation (dB)		21.00	44.00	5.00
Pan (%)				
Root Key				
Tune, Coarse (st)				
Tune, Fine (c)				
Scale Tuning (c)				


There are many parameters listed at the left of this View, and in the example, apart from the ones above, they are all empty, except for the “Global Reverb Send” cell, which has been given the value, “100”. So I have simply made a screenshot showing the final few parameters:

Mod LFO->Pitch (c)				
Mod LFO->Filter (c)				
Mod LFO->Volum (dB)				
Vib LFO Delay (X)				
Vib LFO Freq (X)				
Vib LFO->Pitch (c)				
Chorus Send (%)				
Reverb Send (%)		100		

SoundFont file information

Key	Value
Folder	C:\Acoustic\Sounds-Ranges\kelr
File name	Eccles_Great_Chorus5.sf2
Internal name	Eccles_Great_Chorus5.sf2
Version	2.1
Date	16/08/2011 11:52:51
Designer	SynthFont Viena
Copyright	SynthFont Viena

Save changes



Statistics

Key	Value
Nr of samples	197
Nr of samples not used	6 - PURGE!
Nr of instruments	10
Nr of instruments not used	0
Nr of presets	7
Nr of instrument generators	1969 (<=65536)
Nr of preset generators	30 (<=65536)

Reverb Send - unit %, sets how much of the signal should be sent to any Reverb effect

To type a value into a cell or to change a value, click on the cell two or three times (and perhaps do some deleting - whichever is needed), type in the value and press “Enter”. If you are about to type in

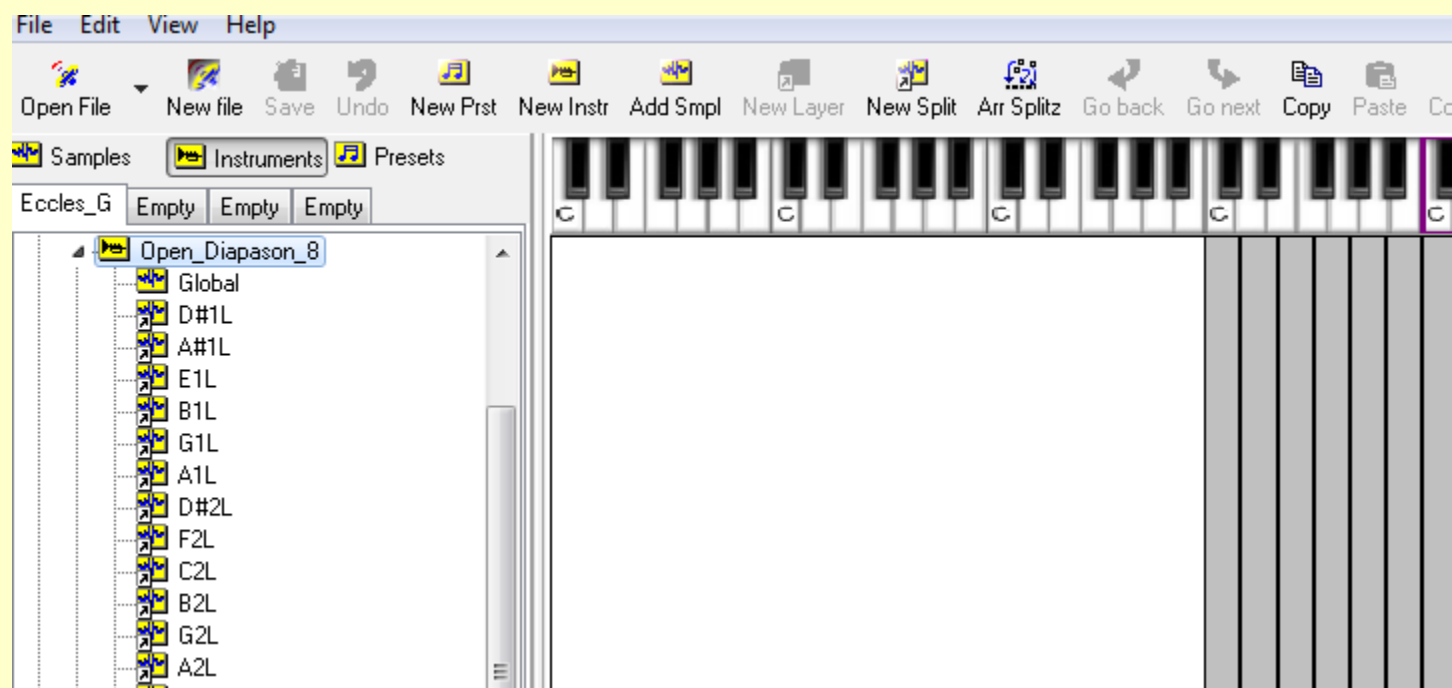
other values in other cells, the “Enter” can be left until the last one. In order to read the whole View, it is necessary to manipulate the vertical scroll control at the extreme right of the screen. Below the View Window, Viena has listed some information about the current soundfont. Below the file information is a message about “Reverb Send”. This message is not permanent – it may be that I had the mouse cursor on this row immediately before doing the Printscreen.

The Attenuation Settings in the third row suggest that “x” dB of attenuation is applied to the Instruments as indicated by the values, but in practice the figures are not accurate. I have written an article explaining the actual behaviour of various sound engines in applying these values, and it can be accessed on my website - [https://jorgan.info/base/arch/jr/ar/Attenuation\\_Settings.htm](https://jorgan.info/base/arch/jr/ar/Attenuation_Settings.htm)

Above the View Window is a keyboard, which can be activated by the mouse to play individual notes. In my case the sounds are marred slightly by repetitive clicks. When I click on “Setup” at the top of the screen and select ASIO (I have ASIO4ALL installed) instead of Direct Sound, the clicks disappear.

To view the details of another Preset, simply double-click on its main entry in the Preset List. If you wish to close the details of the previously-viewed Preset, double-click on its main entry. If you wish to view the details of an Instrument, you can double-click on the “Instrument” entry in the main list and then on the Instrument entry which has appeared now in the Instrument List. Alternatively, you can double-click on the Instrument entry in the Preset listing of the Preset you are currently viewing.

The following screenshot shows part of what we see when we view the “Open\_Diapason\_8” Instrument.



In the Management Window we see a listing of all the samples used in this Instrument, preceded by the “Global” item. In the View Window we see a diagrammatic representation of the splits, with each split lined up below the notes on the keyboard to which it corresponds. (The top two octaves are off to the right).

If we click on any of the items in the list, the View Window shows the Instrument Cells View, which follows.

Parameters	Splits: Global	1: D#1L	2: A#1L	3: E1L	4: B1L	5: G1L	6: A1L	7: D#2L	8: F2L	9: C2L	10: B2L
Key Range		36-37	42-43	38-39	44-45	40-41	46-47	48-49	54-55	50-51	56-57
Velocity Range											
Attenuation (dB)			16.0	4.0	20.0		16.0	20.0	34.0	27.0	24.0
Pan (%)		-3.0	6.0	3.0	-9.0	-6.0	9.0	-12.0	15.0	12.0	-18.0
Sample Mode (Loop?)	1										
Root Key		51	46	52	47	55	57	51	53	48	59
Tune, Coarse (st)											
Tune, Fine (c)		1	1	1	1	1	1	-3	-2	-3	-2
Scale Tuning (c)											
Filter Freq (Hz)											
Filter Reson (dB)											
Vol Env Delay (s)											
Vol Env Attack (s)											
Vol Env Hold (s)											
Vol Env Decay (s)											
Vol Env Sustain(dB)											
Vol Env Release (s)		0.300	0.300	0.300	0.300	0.300	0.300	0.200	0.200	0.200	0.200
Key->Vol E Hold (x)											
Key->Vol E Decay(x)											
Mod Env Delay (s)											
Mod Env Attack (s)											

This screenshot shows only the first ten splits. But even in using the program it is often necessary to manipulate the Horizontal Scroll Bar in order to view the final ones. (It can be seen at the bottom of this screenshot). Notice that the split identifier indicates the sample used for that split along with the split identifying number.

## PARAMETERS

In what follows I shall comment on the parameters which I tend to use. Particular values can be typed in for each split. If all or most of the splits have the same value for some parameter, that value can be typed into the Global Cell for that parameter. If a value for such a parameter does have some other value typed in, then the latter value takes precedence over whatever is in the Global Cell. The process of entering or changing values is identical to that described above for the Preset values.

**Key Range:** The values indicate the notes belonging to the split, and conform to the MIDI note numbering convention, where “60” is used for Middle C (261.6 Hz).

**Attenuation (dB):** I call this value the “Attenuation Setting”. It allows the volume of the notes in a split to be set independently from that of notes in other splits. A higher number means a softer sound. See my remark above, in the section describing Preset Cells, regarding the actual level of attenuation applied for given values. Negative values can also be used, reportedly up to “-30”, in order to boost the volume.

**Pan (%):** If the sample is a mono sample, then this value “positions” the notes from this split at some specific point across the sound field between the two loudspeakers, providing a type of stereo effect.

“-50” would place the sound totally in one channel (probably the left), “0” would be equal amounts in each, and so sounding mid-way, and “50” would be totally in the other channel.

**Root Key:** This value indicates the pitch of the sample belonging to the split, expressed as a MIDI note number. If you change such a value by subtracting “12”, it will have the effect of raising the generated pitch of the notes in that split by one octave, for example.

**Tune, Fine (cents):** The value raises or lowers (if negative) the pitch of the notes in the split by that number of cents. (A cent is one hundredth of the frequency difference between two adjacent notes in the equally tempered scale). In my case I apply values to this parameter in order to produce a tuning system where octavely-related notes are given slight pitch differences from each other, avoiding too-perfect tuning.

**Vol Env Release (seconds):** The value typed in controls the length of the release period generated by the sound engine when a note ceases to be played.

**Mod LFO Frequency (Hz):** This is one of the parameters for a Low Frequency modulator, which allows for both amplitude and pitch modulation of the sound being generated, and even with a delay before the modulation is applied. This value controls the RATE in Hz at which the modulation occurs. I use it as one of the variables in my “Earlwood Wobble” effect, and I usually apply it at the Instrument level. Typically I give it a value of 1 Hz or less (e.g. 0.33 Hz, which means that the modulation repeats cyclically each 3 seconds). An article describing the “Earlwood Wobble” can be accessed on my website - [https://jorgan.info/base/arch/jr/ar/Earlwood\\_Wobble.htm](https://jorgan.info/base/arch/jr/ar/Earlwood_Wobble.htm)

**Mod LFO->Pitch (cents):** This value controls the maximum PITCH variation of the modulation (positive and negative) for the “Earlwood Wobble” effect, and typically might be 2 or 3 cents. Sometimes I apply it at the Instrument level, and sometimes at the Preset level. I am not aware of any particular reason why I have varied it in this way.

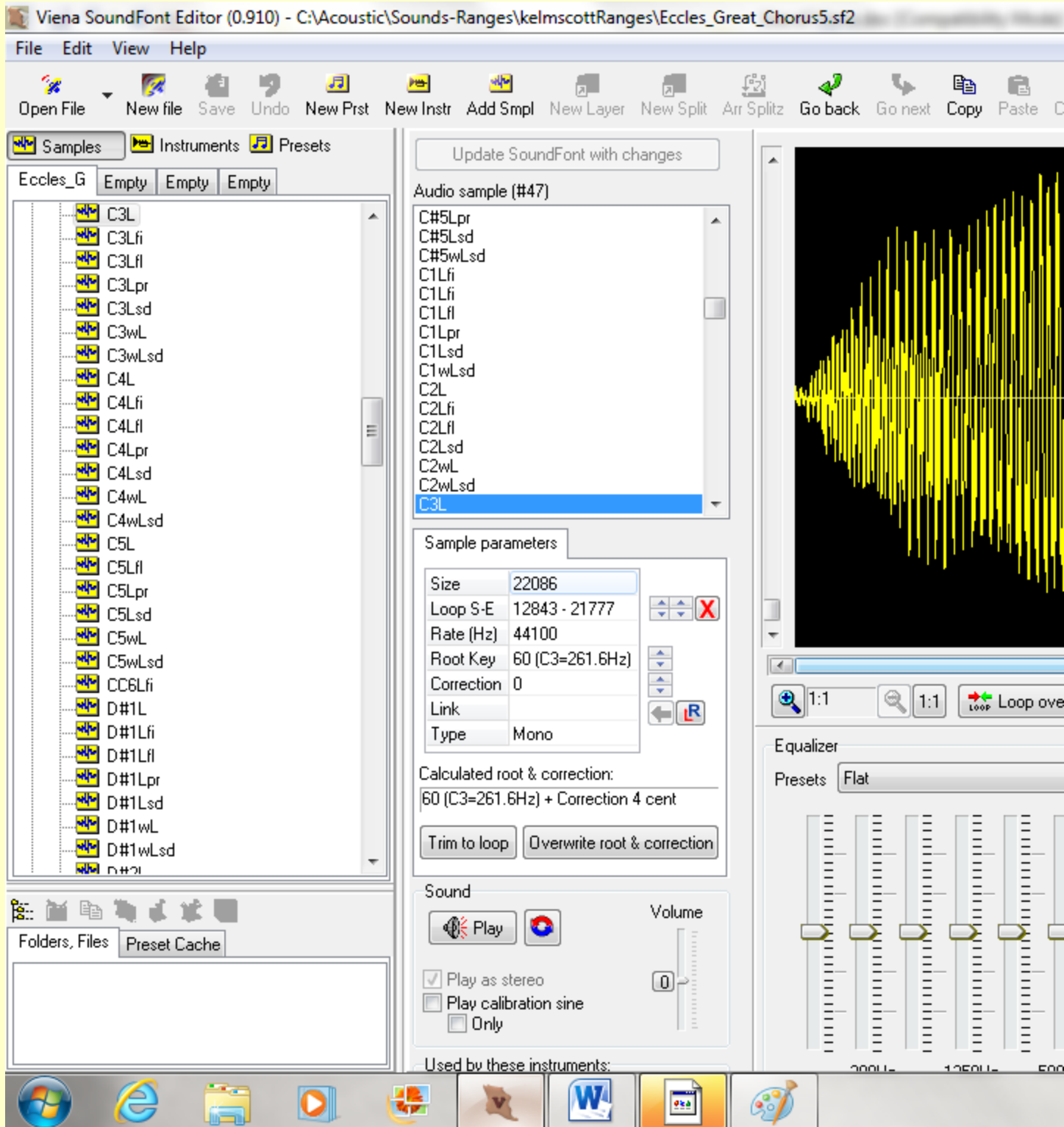
**Vib LFO Frequency (Hz):** This Low Frequency modulator is a second one, and allows only for pitch modulation. I use it for the Tremulant stops (although it only applies a “vibrato”). The value sets the rate of the vibrato, and typically I use 6 Hz. In my case the depth of the vibrato is controlled by a setting (called a “message”) in the jOrgan disposition.

**Reverb Send (%):** This parameter instructs the sound engine to apply reverberation to the sound. I usually type it into the Preset Global Cell as “100”, leaving the Instrument Global Cell empty for this parameter.

## **SAMPLE VIEW**

It remains for us to examine the Sample View. This can be achieved either by double-clicking on one of the sample entries in the existing Instrument list of the Management View, or closing the Instrument View by double-clicking on the Instrument entry and then double-clicking on the “Audio Samples” heading at the top of the Management View List. In the latter case you will then need to click on the particular sample you wish to examine.

To achieve the following screenshot, I have taken the first course, and clicked on sample “C3L”. The Viena display fails to show the details at the extreme bottom, and in actual use, the vertical scroll control at the right is needed to access what is missing. The following screenshot also fails to show the extreme right of the display.



In these Sample Views, Viena has listed ALL the samples used in the soundfont, and not just the ones for the Open\_Diapason\_8 Instrument. It has highlighted “C3L”, in the list titled “Sample #47”. The “#47” is Viena’s own identifier of the “C3L” sample, and has no particular significance. Notice that below that list is a display titled “Sample parameters”. Among other things, it identifies the positions of the looping Start and End Markers. These can be altered by the user, by means of the arrow boxes to the right of the entries. After you make any changes, Viena will expect you to update them, and there is a button at the top which you are to click on.

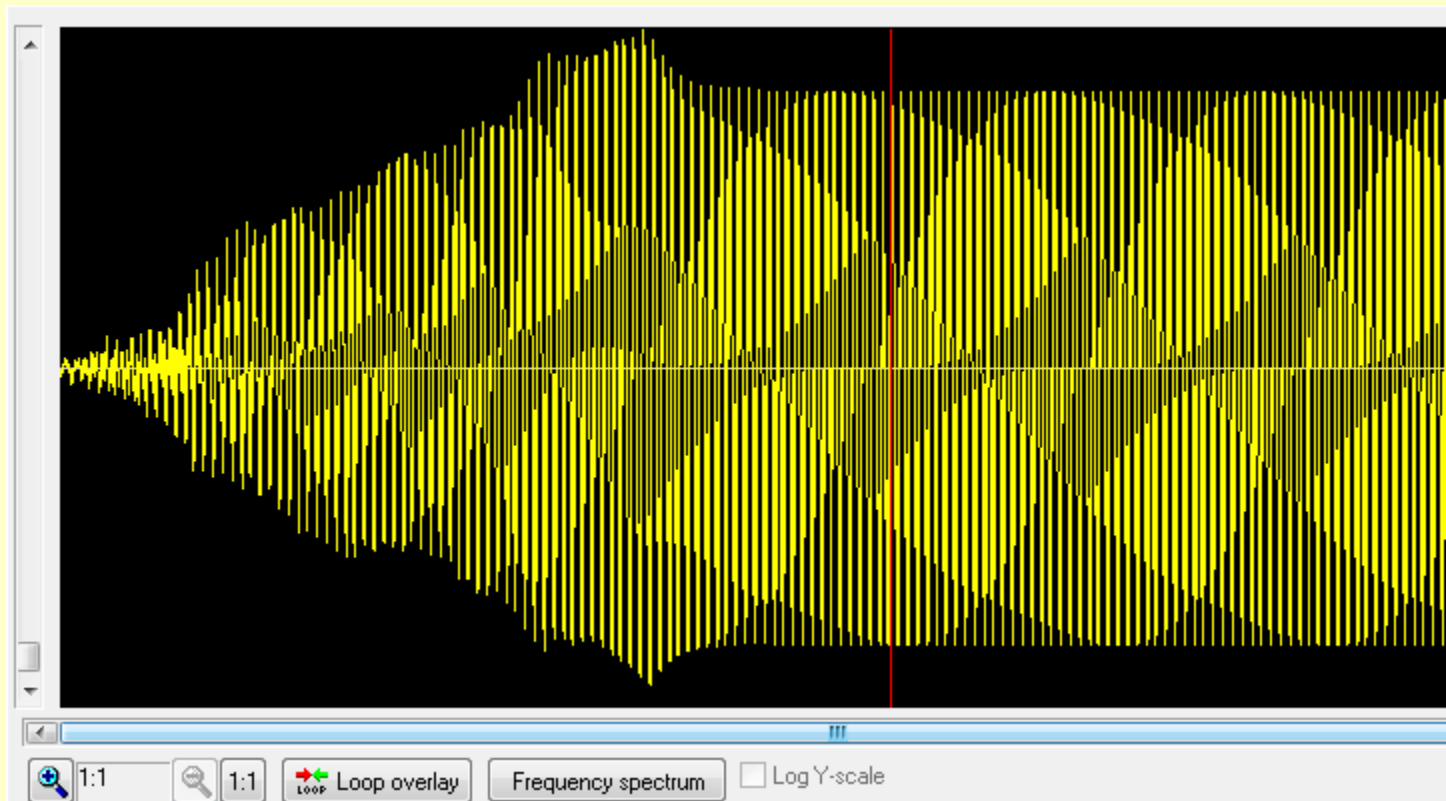


Below the “Sample parameters” there is provision for playing the sample (click on “Play”). To hear the sample looping, you must first click on the red/blue icon. Click on it again if you wish to remove the looping provision from the playing.

At the right of the Play buttons there is an Equalizer by which you can “revoice” the sample somewhat. I have not used it in my processing, and shall not refer to it again in the first release of this article.

To the right of the Equalizer there is an “Export WAV file” button. You will use this if you wish to make a copy of the currently-displayed sample in some folder you have chosen.

In the following screenshot we have just the Sample View, which is worthy of some detailed description.



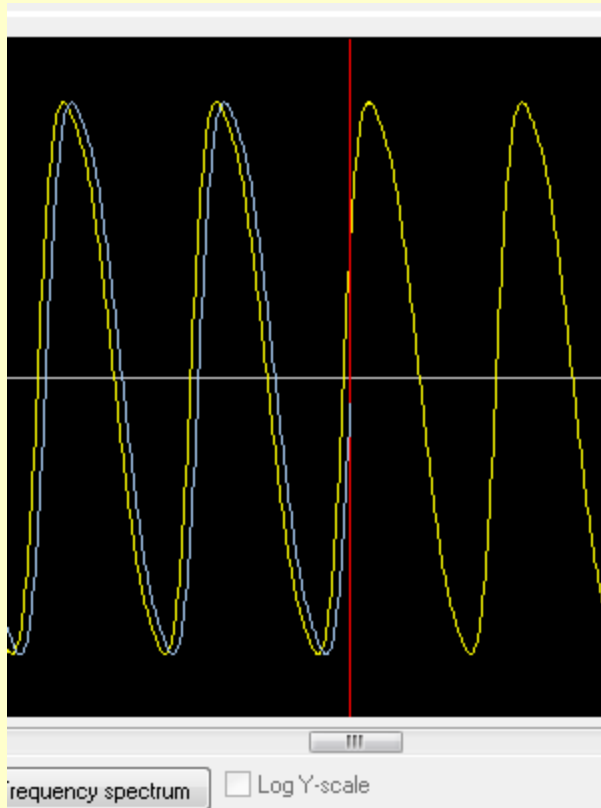
### SETTING LOOPING MARKERS

What we see above is a display of the entire sample, which is probably about 0.5 seconds in duration. The attack section has an obviously different appearance to the looped section. The red vertical line shows the loop Start Marker, and off to the right (off the screenshot) there is a blue vertical line which shows the loop End Marker. It is just short of the end of the sample. You will sometimes find samples where the loop End Marker is co-incident with the end of the sample. Notice that the loop Start Marker is well clear of the attack section, and I have done this on purpose. In this example it is possible that a looping program has been used to place the two markers, but this Vienna graphical interface is so good that in samples where the looped section is totally regular (as I usually intend my samples to be), it is quite easy to locate the loop markers with no other help. The key to moving the markers is that you right-click on the End Marker and then drag it by the mouse (still holding down the right switch) to some desired position. For the Start Marker, you use a left-click.

There is what appears to be a scroll control at the left of the display, but it is in fact a “gain control” allowing you to observe vertical detail of the waveform more closely. Below the display there is a

horizontal scroll control, but it won't look like one, until you do a horizontal zoom. Clicking successively on the "+" magnifier will achieve that, while clicking on the "-" magnifier will reduce the zoom. You will certainly need to do a horizontal zoom if you wish to adjust the positions of the loop markers.

Having positioned the markers, you may wish to check if you have got it quite right. If you click on "Loop overlay", you will be given a clever display which will put the matter beyond question. It is usual to have to do a number of levels of zoom to get the display right. For the next screenshot, I have purposely set the Start Marker a few steps "off", to show you what it looks like.



To correct this, it is a simple matter to click on the Start Marker arrow boxes, as explained above, until the two images on the left of the red line co-incide.

There is a display of the Harmonic Spectrum which you may find of interest. After clicking on the button to bring it up, you will probably need to click on the "Log Y-scale" box to make the display meaningful. Unfortunately it does not show actual harmonic amplitude levels.

## MAKING A SOUNDFONT

I shall take you through the steps I use to make a soundfont, and shall confine my information to those aspects of Viena with which I am familiar.

1. Run Viena and click on "New file".
2. Give it a name. (For the purposes of this demonstration, I am calling it "Example".
3. Click on "Add Smpl". Navigate to where you have your looped sample(s), select it/them, and click on "Open". (I have added two: C#3Lpr.wav and C#5Lpr.wav).
4. In turn, check each sample for correct looping. (Click on "Loop overlay", zoom until the display is clear, click on the marker arrow boxes if needed, use the Play function, having clicked on the

red/blue icon for playing the loop, and if satisfied after adjusting the markers, click on “Update Soundfont with changes”. Do all this for each sample). At this point it may be sensible to Save the file. (Click on File”, “Save”).

5. Click on “New Instr”.
6. In the New Instrument dialog box, give the Instrument a name. (I called it “New\_Principal” – note the underscore instead of a space).
7. Select “Samples or Splits?”. Because no splits yet exist, you will be offered only “Create new Splits (from Samples)”.

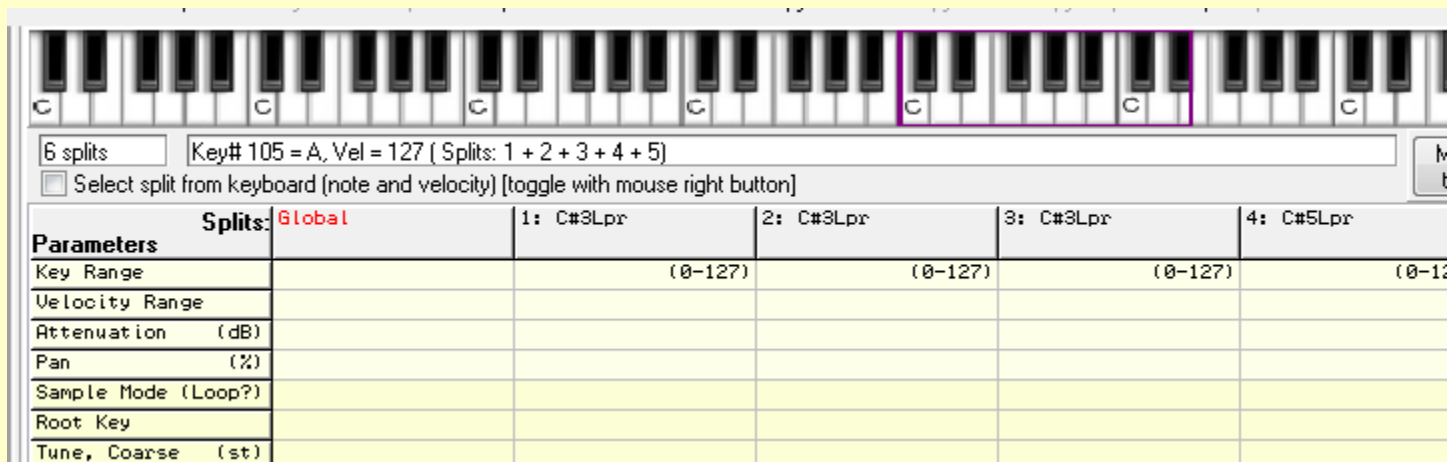
It is my intention to use sample C#3Lpr for the first three splits, and C#5Lpr for the last two. Although the list offers me both samples, I shall select C#3Lpr only, for the first three splits. After selecting it, click on “OK”. This process has to be repeated, as I make the next two splits. Click on “New Split”. This time, however, I shall be offered “Use existing splits”, and I choose that. The list of existing splits is shown, and I make sure I select only C#3Lpr before clicking “OK”. This has to be done again, for the third split, and the list offers me two C#3Lpr splits, but because I want only one additional C#3Lp split, I select only one.

This whole process is repeated until I have made two C#5Lpr splits.

In the Management Window we now have “New\_Principal”, along with the list of its splits. If at any stage you want to change the name, double-click on the entry, do a right-click, click on “Edit name”, and make the change. Then do a click somewhere in the Management Window (but not in the entry rectangle).

8. Click on “Global” in order to bring up the Instrument Cells View. You will notice that the screenshot shows the five splits with their samples, and in correct order. (In some of the soundfonts I have made – perhaps all of them – the 30 splits are not in consistent order. This can be a little confusing when working on the soundfont, but it doesn’t seem to affect its operation).

From the screenshot, clearly the key ranges of the splits need some work!



If you click anywhere on one of the split “columns” and click on “Arr Splitz” (at the top of the screen) you will be given a dialog window for editing that split. I don’t altogether understand its features, so instead I prefer to edit the splits directly.

The next screenshot shows the results of my editing, which includes inserting some Volume Envelope Release values. Regrettably, not all the information has got into the screenshot. For Split 4, the Key Range is 72-83. Split 5 is missing. Its Key Range is 84-96, Pan 50, Root Key 85, Vol Env Release 0.2.

Parameters	Splits: Global	1: C#3Lpr	2: C#3Lpr	3: C#3Lpr	4: C#5Lpr
Key Range		36-47	48-59	60-71	72-
Velocity Range					
Attenuation (dB)					
Pan (%)		-50.0	-25.0		25
Sample Mode (Loop?)	1				
Root Key		61	61	61	
Tune, Coarse (st)					
Tune, Fine (c)					
Scale Tuning (c)					
Filter Freq (Hz)					
Filter Reson (dB)					
Vol Env Delay (s)					
Vol Env Attack (s)					
Vol Env Hold (s)					
Vol Env Decay (s)					
Vol Env Sustain(dB)					
Vol Env Release (s)		0.300	0.200	0.200	0.2
Key->Vol E Hold (x)					
Key->Vol E Decay(x)					

When playing this by means of the Viena keyboard, I found that the top two splits were one octave low. Apparently I had forgotten that when making the C#5Lpr sample, I had halved the pitch. So to get this instrument correct in pitch, it was necessary to edit once more, changing the Root Key for Splits 4 and 5, from “85”to “73”.

Always remember to Save the soundfont after making any changes. With Saves other than the first one, you will be asked whether you want to make a back up of the previous file. I usually click on “NO”, but there is a certain security in knowing that you can return to what you had before you made the changes.

- The final task is to make the Preset. Click on “New Prst”, give it a new Preset Number if the one offered you is unsatisfactory (“0” is usual for the first Preset in a soundfont), and give the Preset a name. (Again use underscores instead of spaces). Select the Instrument(s) you wish to use in this Preset, and click “OK”. Double-click on the Preset entry to bring up its list, and click on any one entry in the list to bring up the Preset Cells View. Viena has probably inserted the Key Range, in brackets. You may wish to type in some Attenuation Setting if you wish to balance the volume of this Preset with some other. There is really nothing else you have to do except type in “100” in the Reverb Send Global Cell, if you are following my normal practice. Save the soundfont. You should be able to play the Preset using the Viena keyboard.

## SPECIAL FUNCTIONS

In this section I shall mention some functions which I have found useful.

### ADD SAMPLE

This function has already been mentioned, as it is basic to even beginning to make a soundfont. However, there may be times when you have found it necessary to make changes to a sample, and you wish to use it in the soundfont without changing its name. Viena will allow you to do this, and will ask you if you wish to replace the sample of the same name with the new version. What I have found, however, is that you should not have selected (highlighted) the sample in question, in the sample list. Simply select some other sample, and all should be well.

## REASSIGN SAMPLE

I have found the “Reassign” function very useful, in those cases where I wished to replace a sample in a split by one of a different name altogether. For example, I have a standard format of 30 splits in respect of the Key Ranges and Pan values involved. Rather than repeat all the work needed to enter those values each time I make a new Instrument, I prefer to use an existing Instrument as a template, having renamed it appropriately, and to re-assign the samples for those 30 splits. To do this, bring up the Instrument Cells View, click on “Wave data” (found just below the View Window), click on the split you wish to change, and click on the top of the two “Reassign” buttons near the bottom of the screen. You will be presented with a list of samples. Select the one you wish to use, and click on “OK”. If for some reason the new sample has a different Root Key to that of the sample being replaced, you will need to type in the correct value.

## COPY PRESET

“Copy Prsts” at the top of the screen is normally greyed out. If you look at the second screenshot above, showing the Management Window, you will see at the top the name of the soundfont I had opened, along with three instances of the word, “Empty”. Viena allows you to have four soundfonts open at the same time, although only one will be in full use. If you click on the first “Empty” (assuming you already have a soundfont file open), then you can open a second soundfont. “Copy Prsts” will no longer be greyed out, and you can copy Presets from the second soundfont into the first (or the other way around, depending on which soundfont you have recently clicked on).

I have used this extensively in treating an existing Instrument as a template for some new Instrument. I copy a Preset containing the existing Instrument (having firstly renamed it if there is already, for some reason, an Instrument of the same name in the soundfont I am working on). Note that if the Preset being copied has a Preset Number which already belongs to a Preset in the soundfont I am working on, I may firstly “manufacture” a new small soundfont in one of the other instances of “Empty”, copy the Preset into it, and in the process give it a suitable Preset Number. I can then copy THAT version of the Preset into the desired soundfont (Viena will allow me to select it, if I answer the dialog questions correctly). The copy process will import the Instrument I wish to use as a template, and I can then delete the copied Preset. That imported Instrument will still be there, and once fully edited, will be used in some “legitimate” Preset in the soundfont I am working on.

## DELETE

To delete elements (Samples, Instruments, Presets), click on the element in one of the Management Window lists, click “Edit”, and click “Delete”. However Viena will allow you to do this only if the Sample or Instrument is not allocated to an Instrument or Preset. If you follow the sequence Preset, Instrument, Sample in deleting elements, then there should be little problem. For example, there is no difficulty in deleting an Instrument from a Preset List. The Purge command can deal with unnecessary elements when appropriate (see below).

## NEW INSTRUMENT

This function is dealt with above in “Making a Soundfont”.

## NEW LAYER

It is possible at any time to add further Instruments to an existing Preset. Click on the Preset entry, and then on “New Layer” at the top of the screen. You will be offered a list of the existing Instruments, from which you can select one or more.

## PURGE

When you have completed your work in making a new soundfont or in editing an existing one, there may well be some samples in the soundfont that are no longer required. If you click on “Edit” and then on “Purge”, Viena will remove those unnecessary samples. It is probably good practice to leave this operation until the very last.

John Reimer, Sydney, January 2012