Pattern Editor

December 3, 2017

```
 |TRACK 00  <) ||TRACK 01  <) ||TRACK 02  <) ||TRACK 03  <) ||_._.____.|
00|             ||E-6 01 3F    ||             ||E-2 02 30    || ..
01|             ||A-6 01 30    ||             ||             || ..
02|             ||B-6 01 3F B60||             ||             || ..
03|             ||E-6 01 30    ||             ||             || ..
04|             ||B-6 01 30    ||             ||             || ..
05|             ||C#7 01 30 BA0||             ||             || ..
06|             ||A-6 01 3F    ||             ||B-3 02 30    || ..
07|        0A   ||        4A4||               ||             || ..
08|F#4 00 3F    ||        4A4||               ||             || ..
09|F#4 00 12    ||        4A4||               ||             || ..
0A|             ||        4A4||               ||             || ..
0B|F#4 00 3F    ||G-6 01 3F    ||             ||             || ..
0C|             ||             ||             ||             || ..
0D|             ||             ||             ||             || ..
0E|F#4 00 3F    ||F#6 01 3F    ||             ||G-3 02 30    || ..
0F|             ||             ||             ||             || ..
10|D-5 00 15    ||G-6 01 3F 380||            ||E-3 02 30 350|| ..
11|             ||        380||               ||        350|| ..
12|             ||F#6 01 2F    ||             ||G-3 02 30    || ..
13|             ||        B07||               ||             || ..
14|             ||        B07||               ||        B20|| ..
15|             ||        B07||               ||        B60|| ..
16|             ||G-6 01 2F    ||             ||G-3 02 30    || ..
17|             ||        B07||               ||             || ..
18|F#4 00 3F    ||        B07||               ||             || ..
19|F#4 00 12    ||        B07||               ||             || ..
```

Introduction

The pattern editor is the window in the center of the terminal when you start PLEBTracker. This window displays one pattern of song data. Tracks are the vertical columns. When a pattern is played, it is played from top to bottom. Within a track in the pattern editor, there are 4 fields to edit.

```
||C-4 00 3F 204||
```

Note [C-4] A musical note, and its octave.

Instrument [00] Which instrument to play from the instrument list.

Volume [3F] How loud this note should be.

Effect [204] Function changes between different effects. See the section titled Effects.

Notes

The first field in a track is the note and octave. ||C-2 00 3F 444||

To change octaves within the pattern editor press SHIFT and the number key of which octave to change to. When you press SHIFT + 2 the interface will say OCT: 1, this is correct. The bottom two rows of your keyboard (beginning with 'a' and 'z') will play notes in octave 1. The number row and row beginning with 'q' will play notes in octave 2.

The default key signature of the tracker is Chromatic C, which means when the tracker populates the keyboard bindings to the notes they represent. 'q' and 'z' will be C (because the key is C,) and each key as you go along the keyboard will increase by a halfstep (because the scale is Chromatic.) It is possible to change the key and scale in the meta window (TAB + q.) When changing Key, press the key that represents the key you want in the default chromatic C bindings (q sets the key to C, 2 sets the key to C#, etc.)

There are two options when choosing a scale, if you choose to use one (you can still just use the Chromatic C bindings and just choose the notes of that key yourself if you want.) There are two options when changing scale. One is to use one of the scales provided by pressing the up and down buttons by the scale display. However if you want to create your own scale and populate the key bindings to keys of any arbitrary scale you can edit the *scale construction* by hovering over the scale display. Observe what happens to the scale display when you change the scale using the up and down arrows (then hover over the scale.) The numbers that you see represent the difference in semi-tones (half-steps) between notes in a scale. You can change this scale to any scale (that stays within one octave.)

Instrument

The second field in a track is the Instrument. ||C-2 00 3F 444||

The instrument can not be set to an instrument that does not yet exist, so when you begin the tracker for the first time, this can't be anything but 00 until a new instrument is made.

When the instrument for an entry within a track is set, the instrument is played. This means that the volume envelope begins again at the first index, and the wave and pulse indicies are (re)set according to this instrument's fields.

If the pulse index for an instrument is set to [_ _ _ _], (by pressing Space or Del when editing an instrument's pulse index) then the iteration of the pulse table will continue uninterrupted when this instrument played. Therefore if you have an instrument that starts a loop in the pulse table, then you want to use this instrument, the previous instrument's pulse iteration will continue unaffected, which may have desired or undesired effects. It's common to have:

$$
\begin{array}{c|c}
00 & 0000 \\
01 & FF00
\end{array}
$$

at the top of the pulse table for instruments that don't change the pulse parameter.

If the FA function in the wave table is used for an instrument, and then another instrument is played, the Wave Repeat parameter is unset before processing the next instrument's parameters. This is to avoid having to annoyingly unset the repeat parameter every time you have an instrument that doesn't need it. The FA function in the pulse table does the same thing, but it *doesn't* reset if the new instrument's pulse parameter is set to [_ _ _ _].

Volume

The third field in a track is the Volume. ||C-2 00 3F 444||

This volume specifies the volume of individual notes in a pattern. The range of volume within a pattern is 00 to 3F in hexadecimal. 3F is full volume and 00 is silent.

If a sound must be louder, consider increasing the volume of the instrument in the instrument's Volume Table (TAB + a) or lowering the volume within the song's patterns where appropriate. Another solution is to create a copy of that instrument at a higher volume and use that instrument when you need a louder version of the original.

Effects

The fourth field in a track is the Effect. `||C-2 00 ``3F`` ``444``||`

Effects modify how sounds are produced in that track. There are two types of effects.

On-row effects [R] perform an action once as soon as the tracker reaches that row.

Per-segment effects [S] continue to be applied throughout the row that it is applied (and subsequent rows if the effect continues to be applied).

0XY [S]	Arpeggio up (0,X,Y,0,X,...)
1XX [S]	Portamento up by factor of XX
2XX [S]	Portamento down by factor of XX
3XX [S]	Portamento to note by a factor of XX
4XY [S]	Vibrato (X=Speed, Y=Depth)
5XX [R]	Set wave parameter 1 to XX
6XX [R]	Set wave parameter 2 to XX
7XX [R]	Set wave index of track to XX
8XX [R]	Set pulse parameter to XX00
9XX [R]	Set pulse index of track to XX
AXX [S]	Volume slide up by rate (XX+FF) / FF
BXX [S]	Volume slide down by rate (XX+FF)/FF
CXX [R]	Set filter index of track to XX
DXY [R]	Set filter X to Y000
EXX [R]	Set volume index of track to XX
F_ _ [_]	Undefined

Feel free to ignore the paragraphs marked [Technical].

0XY Arpeggio up

This effect affects the frequency of the waveform currently playing in its track. The effect rapidly alternates 3 different frequencies within one row. The three frequencies are: the ones it's currently playing (base frequency), X semi-tones (half-steps) above the base, then Y semi-tones above the base.

[Technical] The sound of 0XY can sound differently based on whether the value you set for the amount of segments within a row (SEG) is less than the value of ARPEGGIO_SPEED (default 6.) However for all SEG values above or equal to 6 this effect should sound equivalent.

1xx Portamento up

This effect increases the frequency of the sound in this track upwards. Every increase of 6 will have an increase of 1 semitone by the end of that row. For instance 106 will modulate the frequency up one semitone, where 10C will modulate the frequency by two semitones.

[Technical] If you want to know precisely how the sound changes, every segment it performs $frq = frq/(\sqrt[12]{2})^{(6.0 \cdot XX/SEG)}$. The 6 is just to give some extra fineness.

2xx Portamento down

This effect decreases the frequency of the sound in this track downwards. This works in the same way as 1xx Portamento up.

[Technical] Same as 1xx, but multiplies $frq = frq \cdot (\sqrt[12]{2})^{(6.0 \cdot XX/SEG)}$

3xx Portamento to note

This effect modulates the frequency that the track was already at to the frequency of the last note specified in this track. The parameters on this effect are very fine and 300 *does not perform no portamento*. When using this, play around with the parameters until it sounds right, try large and small values like 310, 350, 380, until you find a speed that sounds good.

[Technical] My implementation of this I dont feel confident of, and that is why I can't provide quantitative information on its use. The frequency is exponentially interpolated between frq and nextfrq. This is done as follows:

$$note = log_{\sqrt[12]{2}} frq$$
$$nextnote = log_{\sqrt[12]{2}} nextfrq$$
$$dif = 12.0 \cdot (nextnote - note)/(256 - XX)$$
$$frq = (\sqrt[12]{2})^{note+dif}$$

4xy Vibrato

This effect vibrates a track's frequency upward and downward rapidly within the range of one semitone. The X parameter defines the speed and Y parameter defines the depth. A lower speed is slower, and a higher speed is faster. A depth of F is an entire semitone in one direction (half-step), but since vibrato decreases then increases, the full range of F is two semitones (whole-step, from a half-step below.)

5xx Set Wave Parameter

This sets the Wave parameter utilized by some certain waveforms in the wave table. Sets the wave parameter to XX.

6xx Set Wave Parameter 2

This sets the second Wave parameter utilized by some certain waveforms in the wave table to XX.

7xx Set Wave Index

Sets the operating position for this track in the wave table to XX.

Caveat: Notice that not all possible indicies of the wave table (0-FFFF) can be reached with this effect. If this actually becomes a problem, you could insert some jumps within the wavetable and point to those jumps. Not ideal, but 7xx is more or less a convenience function.

8xx Set Pulse Parameter

Sets the pulse parameter to XX00. This is helpful for using an instrument whose pulse effect does not set (only adds) to the pulse parameter.

9xx Set Pulse Index

Sets the operating position for this track in the pulse table to XX. Same caveat as 7xx.

Axx Volume slide up

Gradually increases the volume of the instrument playing in this track. In actuality, this increases the volume of the track in the *pattern*, opposed to the volume of the Instrument in the volume table. Because of this, Axx will never make an instrument louder than 3F in the pattern window. By the end of the row, the volume will be increased by $3F * \frac{XX}{255}$.

Bxx Volume slide down

Gradually decreases the volume of the instrument playing in this track. By the end of the row, the volume will be decreased by $3F * \frac{XX}{255}$

Cxx Set Filter index

Sets the operating position for this track in the filter table to XX. Same caveat as 7xx.

Dxy Set Filter Parameter

Sets the filter parameter of the X'th filter to Y000.

Exx Set Volume Index

Sets the current volume index of the track to xx. The Volume index is the index that points to an entry in the volume table of the selected instrument. If the index provided exceeds the length of the volume table of this instrument, the index is set to the last index of the table.

F_ _ Undefined