FamiTracker

A Tutorial by Interrobang Pie

It was requested that I do a tutorial for FamiTracker. So here I am, doing just that.

I will begin by covering the basics of a tracker in general before moving on to FamiTracker and chiptuning specifics, so if you already know how to use a tracker, go ahead and skip to page X.

If you find it too dull and boring, I will include yellow tl;dr sections at the end of each chapter for you to read.

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Chapter 1: Tracking Basics

Section 1: What's a tracker?

Before we begin, you should know the basic premise of a tracker. I'm going to quote Wikipedia here:

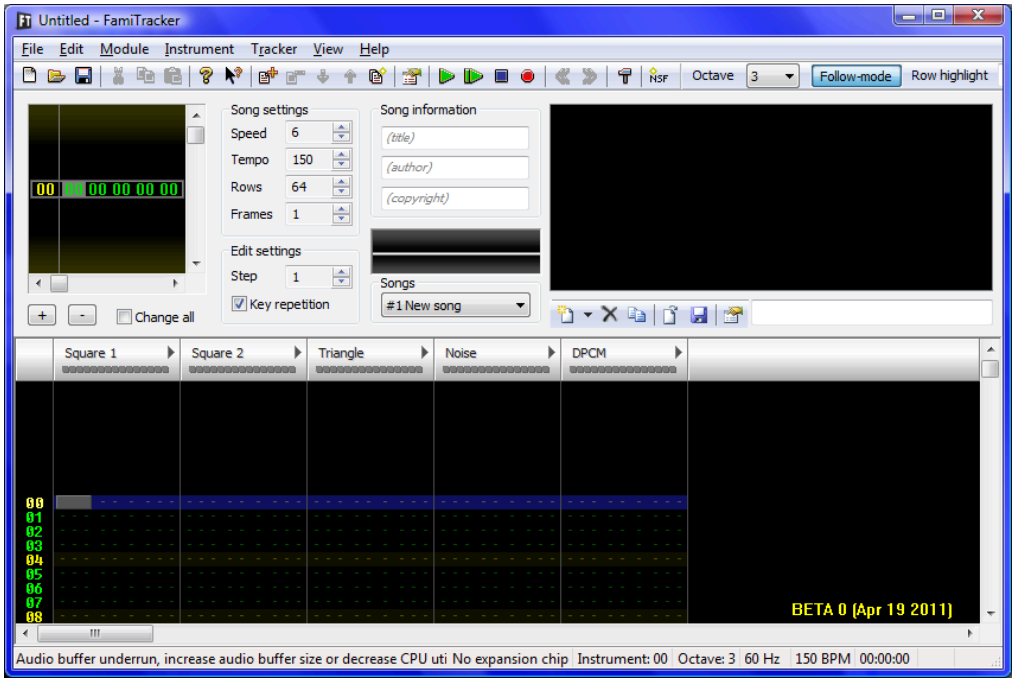
> *"Trackers are a class of music sequencer software used to create and edit module files; they allow the user to arrange notes (pitch-shifted sound samples from the module) stepwise on a timeline across several monophonic channels."*

That's pretty much all there is to it - the tracker runs down the page playing any notes and effects it finds (so very similar to a piano roll, although trackers work from top to bottom instead). Whilst most trackers allow you to import your own samples for use, FamiTracker restricts you to playing around with various NES-generated shapes. You can still define your own envelopes for such things as volume and pitch, though.

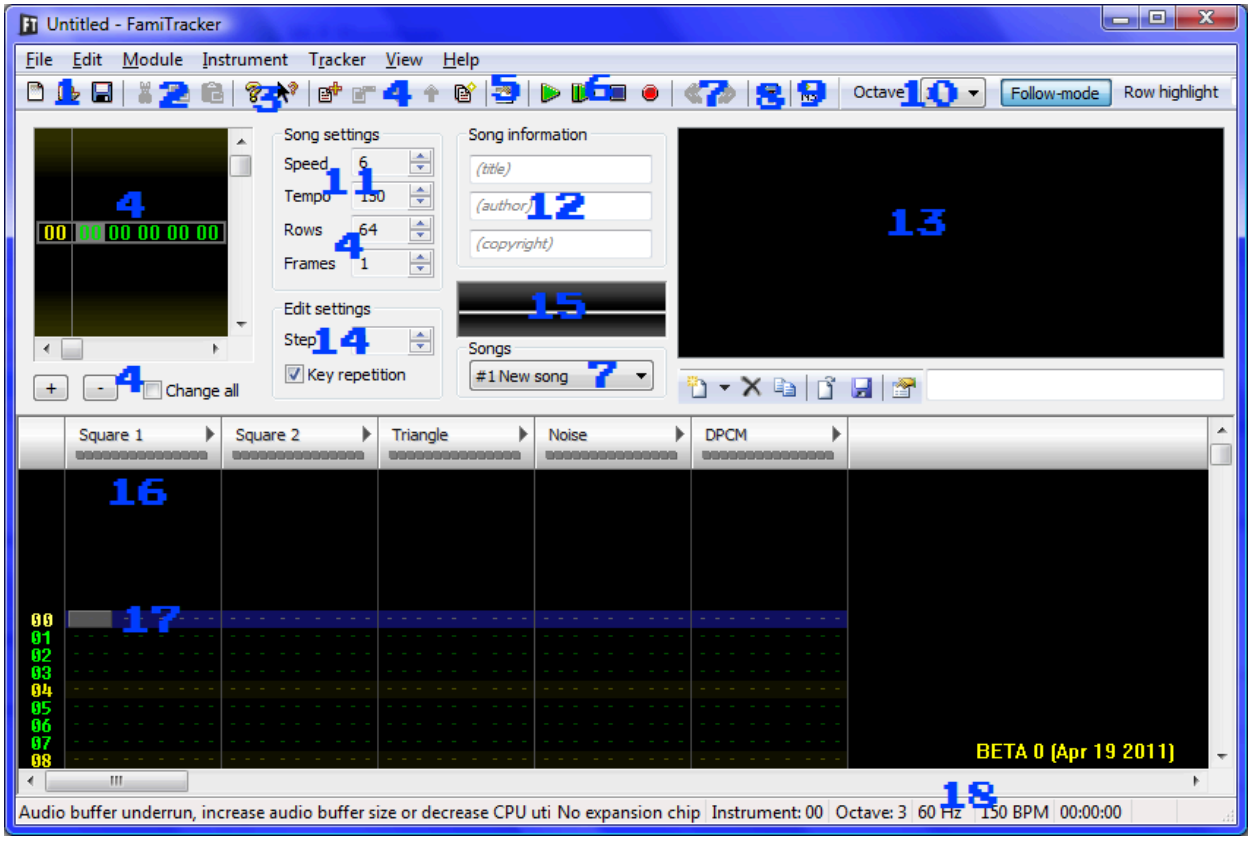
tl;dr trackers are piano rolls except vertical.

Section 2: Shiny Buttons

Okay, firstly you will need to download FamiTracker. You can download Famitracker 0.3.7b here. Once you've downloaded and unzipped it, run the .exe. You should see this:



Okay, now let's cover the GUI. Whilst it may look rather complicated at first, there's only a few areas you need to pay attention to. I'm going to label and briefly explain them all anyway.



Here we go:

1. New/Load/Save buttons. I think you can guess what these do.
2. Cut/Copy/Paste buttons. You should know what these do also.
3. Help functions. Use if I fail to help.
4. Frame/pattern functions. Frames and patterns play a massive role in tracking, so much so I'll need to explain them later in their own section.
5. A shortcut to the module properties menu. Here you can add new songs to the module (more on that later), or change which expansion chip is used, if any (again, more on that later).
6. Play, Stop and Record buttons. The first play arrow will play the song from the beginning of the currently selected pattern. The second one will loop the current pattern. The record button allows you input notes (the bar at 17 changes to red when you are recording).
7. Song functions. More on these later.
8. A shortcut to the configurations menu. Here you can change the tracker's colour scheme, audio settings and key shortcuts.
9. Export NSF button. This exports the current module as an .nsf (NES Sound Format) file. NSFs are (technically) uneditable files with a very small filesize, but you'll need a NSF player to play them. Some NES emulators also have a built in NSF player.
10. Changes the current octave. More on this and inputting notes in a short while.
11. Speed and tempo values. Tempo is measured in BPM. Speed, however, is a little different. Speed refers to the amount of ticks (the delay) the tracker spends on each row

before moving to the next one. As such, speed is a rather contrary term, as reducing the speed of a module will reduce the time the tracker spends on each row, thus increasing the speed of the final result. It's really hard to write that without using speed twice.

12. Here you can name your song. Whatever is placed here gets bundled with your .nsf, should you choose to make one.
13. The instrument editor. More on this later.
14. The step value. This refers to the amount of rows the tracker jumps after you input a note. I guess it could be useful for long, regular sections like percussion, but I hate this function.
15. Waveform graphs. You can change this between a waveform, a waveform with a cool glowy effect, a spectrum analyzer and the FamiTracker logo.
16. A channel. A channel is split up into a number of columns - note, instrument, volume and a variable number of effect columns. This is where you place all your stuff.
17. The cursor. You can move this around by clicking the mouse or with the arrow keys. It also shows the current position in the song. A blue bar means that you are not recording (you can't punch in notes), and red bar means you are. A grey bar means that you are not focused on the pattern editor.
18. Miscellaneous things, like the current BPM or the amount of time it's been playing.

A few of these terms are tracking terms, such as module, frame, pattern, speed, tempo, channel, column and row.

Also, a lot of things are done in hexadecimal. You can convert between decimal and hex using Windows calculator - go into scientific mode, type in your decimal number and press the hex radio button (or vice versa).

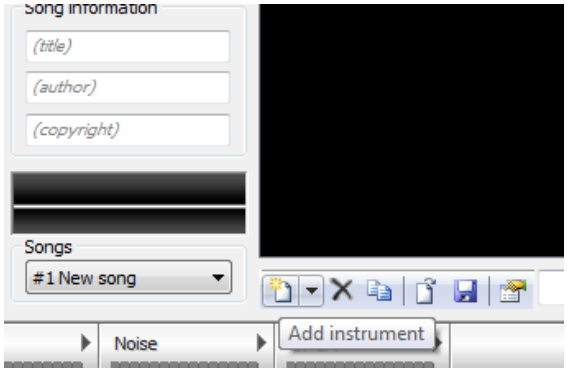
tl;dr the shortcut for the Play button is Enter. Also there's a box for editing BPM.

Now that we got all the boring stuff out the way, it's time to make some chiptunes!

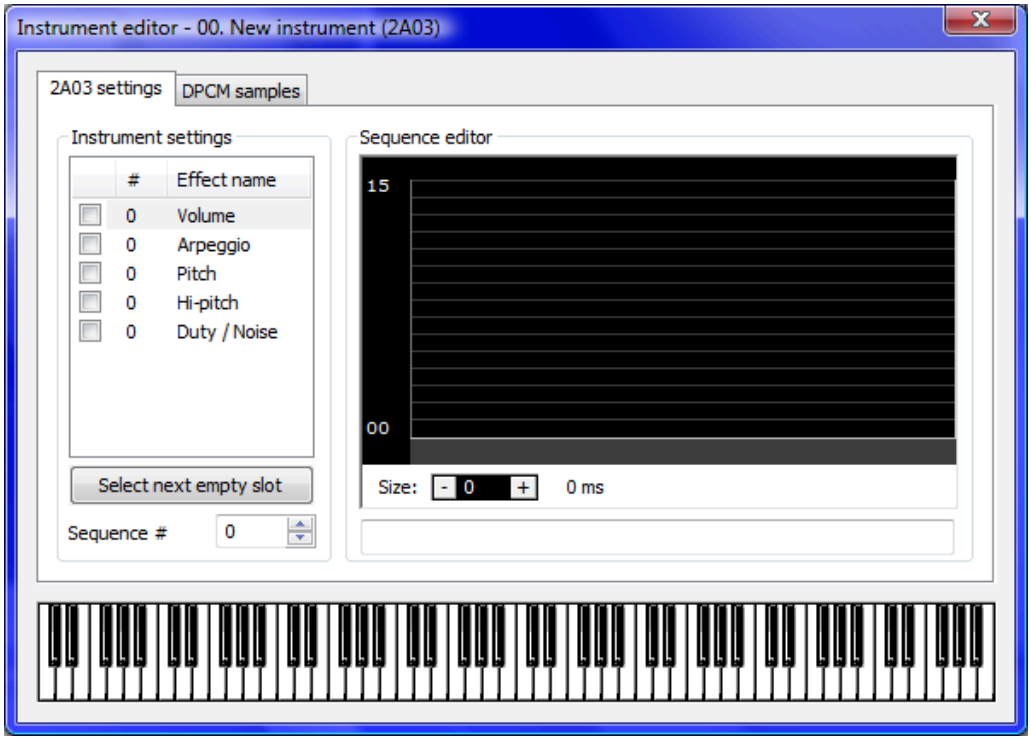
Chapter 2: Simple Chiptunes

Section 1: The Instrument Editor

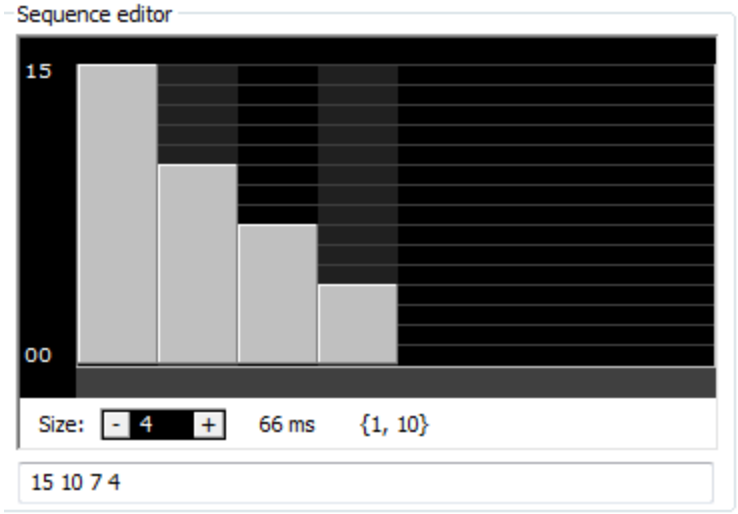
Now, before we start punching in notes, we need to do one vital thing - create an instrument. An instrument serves as the basis for any sound that will be produced. Each instrument allows you to define a separate envelope for volume and pitch, amongst others. You could have a one instrument that defines the lead, one that defines a kick, a hihat, a snare, a crash... Anyway, it's time to click the Add Instrument button.



Once you've done that '00 - New instrument' should appear in the instrument list (that was completely empty before). Go ahead and double click this to bring up the Instrument Editor. This window should appear:



Before we get into what the other envelopes (arpeggio, pitch, hi-pitch and duty) do, let's mess around with the most obvious one - volume. Now, click the small plus sign next to 'size' a few times. You should now see some thin lines at the bottom of the Sequence Editor. Now try clicking above these thin lines. You should get something like this:



As you can see, you now have a nice (or maybe not nice) volume envelope. Each position in the sequence can hold a value from 0 (silence) to 15 (loudest). You can type in values in the box below the envelope - each value is separated by a space.

See that piano at the bottom of the Instrument Editor? Try clicking it. Sound! Now try playing around with the volume envelope. Make it as crazy as you like! (You should take note that the note does not cut when it reaches the end of the envelope (to do this, just stick a 0 at the end)).

You should also see that the '0 Volume' checkbox now has a tick in it - this simply means that the instrument is using envelope 0. To change the number of the envelope the instrument is using, change the value in the 'Sequence #' box. Instrument envelopes are shared between every instrument - if two instruments are using the same value in the 'Sequence #' box and you change the envelope in one instrument, it will change the envelope in the other. Be careful not to overwrite your envelopes!

Also, you can create looping envelopes by putting a bar ('|') in the envelope. Try using this envelope, for example: | 8 10 12 14 12 10

Now that you know the basic premise of how envelopes work in FamiTracker, you can try playing around with the other envelopes:

- The arpeggio envelope is useful for creating pseudo-chords. A value of 0 in the sequencer means that the note will play at the root note (or whatever note is placed into the tracker). A value of 1 will play at one semitone higher than the root note, a value of 2 tow notes higher, and so on. A value of -1 will play at one semitone lower than the root note. Using this knowledge, you can create a major chord by using the following sequence: '| 0 4 7'. Remember that the bar will make the sequence loop - the fast

succession of notes will give the illusion of a chord.
    - There is a way to create arpeggios like this by using an effect. We'll come on to that later, though.
- The pitch envelope is used to finely tune pitch. You can use it to create vibrato effects - try the sequence '| 1 2 1 0 -1 -2 -1 0'. Remember, the bar makes the sequence loop. You can create a faster or slower vibrato by changing the amount of numbers after the loop. If you want a delay before the vibrato, stick a bunch of zeroes before the bar.
    - The pitch envelope is backwards - a value above zero will *reduce* the pitch.
    - Unlike the arpeggio envelope, pitch is relative - this means that if the numbers in the envelope don't total to 0, the pitch of the note will go up or down. Keeping the sum of the numbers in the sequence zero means that the note won't change.
    - Again, there is a way to create vibratos and other pitch bends using effects. More on that later.
- The hi-pitch envelope is used to coarsely tune pitch. Other than for creating extreme triangle kicks (try an envelope of '| 6'), it has no real uses.
    - And yes, there's an effect that does this.
- The duty cycle envelope is used for changing the shape - and thus the sound - of your square wave (it does not effect triangle). The values of 0, 1, 2 and 3 refer to the duty cycles of 12.5%, 25%, 50% and 75% respectively. Whilst 25% and 75% sound the same, the 75% wave is actually the inverse of the 25% wave (this means if you play them at the same frequency, the waves will superpose and cancel out due to destructive interference, and you'll get silence).
    - The duty cycle of a square wave refers to how much of it is 'peak'.
    - And guess what?! There's an effect that does this!

Have a play around with some of the various envelopes before we continue. When you're ready, untick all of the envelope boxes (or clear all of the sequences) except for volume, since that's the only one you'll be needing. You can use any volume envelope you like, but for this example I'll be using '15 12 11 10'.

Now let's start placing notes!!

tl;dr if you want sound, you need instruments.

Section 2: Basic Notation

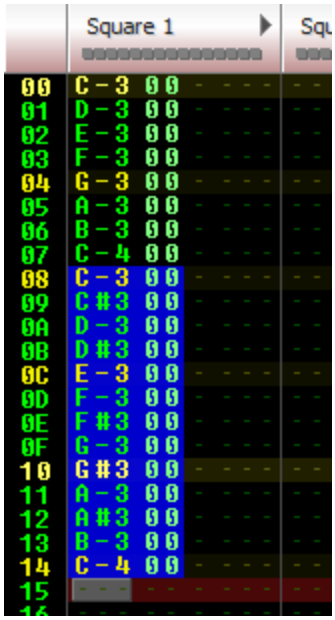
Now let's start placing some notes! Once you have your instrument ready, click the record button (or press Space), and the blue bar should turn red (if the bar is grey that means you're not focused on the pattern editor). This means that when you press a key on your keyboard, a note will be added. Let's do that now - **position the leftmost space on row 00 and press Z once (or if you're using a QWERTZ keyboard, press Y)**. As long as you didn't edit the octave or step value, you should now see this:

What do these numbers mean? The 'C-3' means that the note to be played is a C on octave 3. The '00' means that the instrument to be used is instrument 0 - ie. that instrument you created earlier.

Now press the play button (or Enter). The tracker jumps to row 00, plays your note, and continues. Forever. This is because instead of defining the length of the note (like in a piano roll), a tracker keeps playing a note until it reaches the next one, or the note gets cut. Even if the volume is set to 0, the note is still playing.

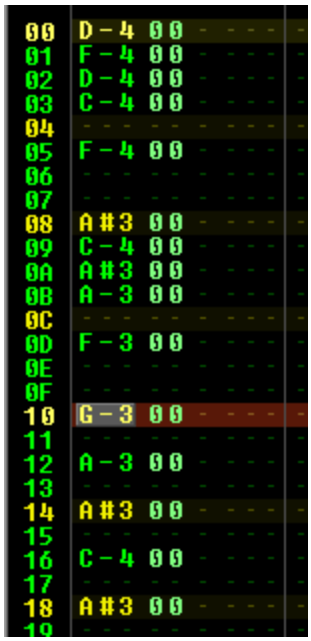
Now let's add some more notes in. Stop the module by clicking the stop button, or by pressing Enter again. Now position the cursor under your first note and press the following combination: **X C V B N M ,**. You should now have a nice, completed scale!

Let's continue. Try **Z S X D C V G B H N J M ,**. You should now have something like this (I highlighted the newest section for you.



Okay, now let's try this: **Q 2 W 3 E R 5 T 6 Y 7 U I**. It's repeated what you just did, but an octave higher! You should now be able to see that your keyboard layout mirrors that of a piano (or a keyboard, ahah).

Now let's make a little song. Delete all the notes you have so far by highlighting them with the mouse, or pressing Ctrl+A, and then Del. Now let's create a really quick demo song for us bronies. Recreate the following:



Hit Play. You should all recognise this instantly (I probably got the starting note wrong but whatever).

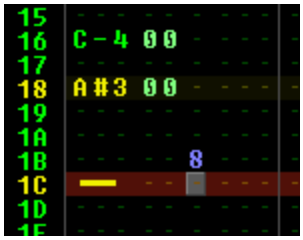
Well, the most obvious issue is that it sounds too fast. I decided to reduce the tempo down to 75 (you could alternatively increase the speed to 12). Now it's at a more suitable tempo, but wouldn't it be good to cut that ugly held note at the end? Let's add a note cut in right now.

For some reason, the note cut button is not assigned to a key by default. Let's do that now. Go into File > Configuration. In the General tab, look for the Note cut field and assign it to a key. I recommend using ` (the key to the left of '1'), as that key isn't used by anything else.

Now let's add in our cut. Row 1C seems like an acceptable place to put it. Move the cursor to the note column (where you've been putting all your notes) of row 1C and hit whatever key you set to note cut. This should appear:

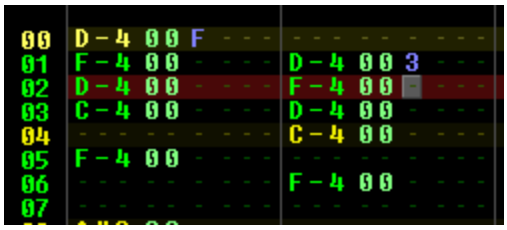
Now try playing it. The sound goes dead as soon as it reaches the note cut. At least we don't have a held note assaulting our ears, but couldn't we make that a little bit smoother? Of course we can. Let's play around with the volume column! What's the volume column? It's this column here:

Now go to row 1B, and in the volume channel type '8'. If you did it right, you should see a lilac number appear, like so:



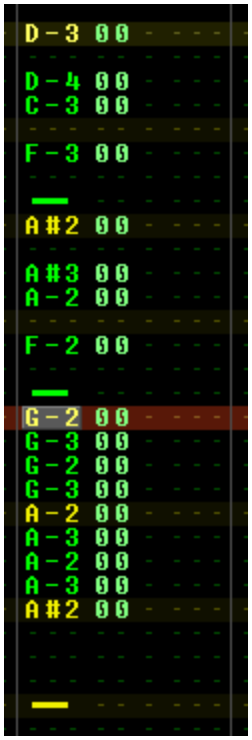
Now press play. It sounds a little better at least, but don't stop there - let it play the whole way through - that is, let it loop. You'll notice that your lead is now quieter. This is because the tracker has not read another number in the volume channel, and so it keeps playing at volume 8 (notes and most effects are also continuous in this manner). Let's rectify this by putting an F at the beginning of the song (remember everything works in hex!). Now when the module loops, it'll start playing back at the correct volume. Hooray!

Okay, now let's use our Square 2 channel. I'm going to be using a very simple technique - a double channel echo (more on these and other useful techniques later). Okay, let's start by selecting the entirety of the Square 1 channel (ctrl+A) and copying it. Move the cursor onto row 01 of the Square 2 channel and hit paste. Now, let's turn that F in the volume channel into a 3, and the 8 at the end into a 1. You should have something like this:



Go ahead and play it. The delay may be quiet, but it's definitely audible.

Now let's mess around with the triangle channel, which is the channel commonly used for bass. Now, the triangle channel only has two volume settings - on or off. This means that we won't be using the volume channel, and the instrument volume envelope won't affect it (unless it has a 0 in it). Over the page you'll find my quick triangle doodle, but you can use your own doodle too!



ONE DAY I'LL FINISH THIS