

Pocket Jam Help ©2003 SiliconMachines

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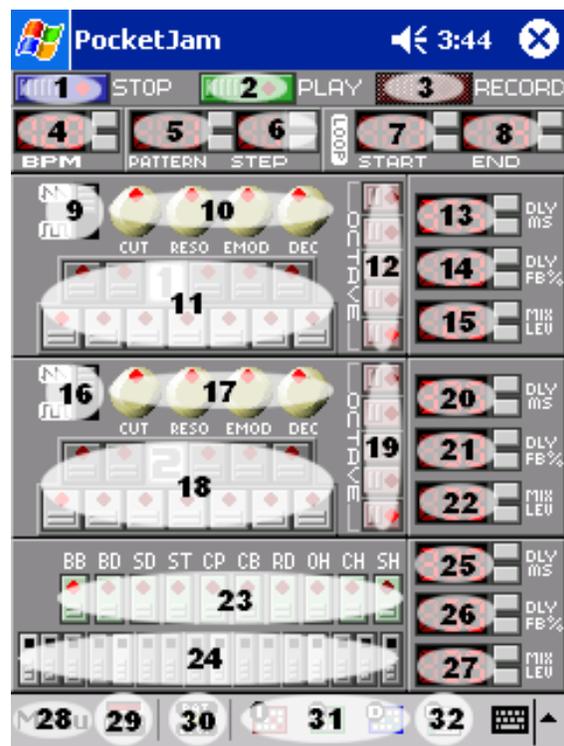
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Labelled diagram of main synth screen

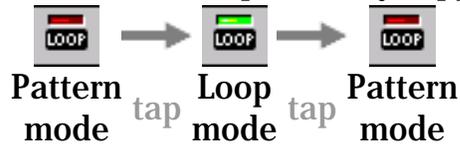


#	Function
1	Stop button, ceases playing/recording of pattern/loop.
2	Play button, when pressed the current pattern/loop is played repeatedly.
3	Record button , (only active in loop mode), when lit any recordable controls are recorded.

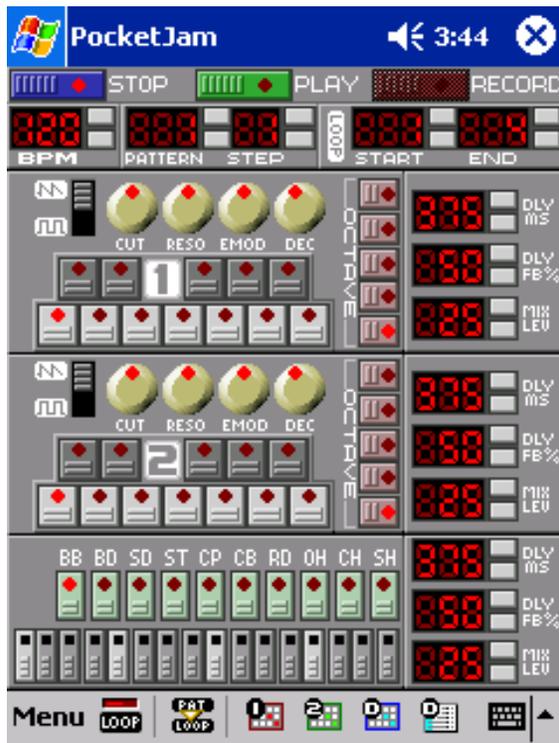
4	BPM LED display, sets the beats per minute of the displayed pattern. (there are 4 beats in one pattern)
5	Pattern number, in pattern mode this is used to select the current pattern.
6	Step number, in pattern mode this allows you to select current step. In loop mode it displays the currently playing step.
7	Loop start, specifies the start position of the loop
8	Loop end, specifies the end position of the loop
9	Synth 1 signal source, allows for the selection of either a saw wave or square wave generator.
10	Synth 1 analog knobs, enable various filter parameters to be tweaked realtime.
11	Synth 1 keyboard, in pattern mode it enables synth 1 melodies to be created in conjunction with the step number [6]. This is an alternative to the synth matrix input method.
12	Synth 1 octave select, used in conjunction with synth 1 keyboard [11] to give a 5 octave range.
13	Synth 1 delay in milliseconds.
14	Synth 1 delay feedback percent.
15	Synth 1 mix level, used to adjust the contribution of synth 1 into the final mix.
16	Synth 2 signal source, allows for the selection of either a saw wave or square wave generator.
17	Synth 2 analog knobs, enable various filter parameters to be tweaked realtime.
18	Synth 2 keyboard, in pattern mode it enables synth 2 melodies to be created in conjunction with the step number [6]
19	Synth 2 octave select, used in conjunction with synth 2 keyboard [18] to give a 5 octave range.
20	Synth 2 delay in milliseconds.
21	Synth 2 delay feedback percent.
22	Synth 2 mix level, used to adjust the contribution of synth 2 into the final mix.
23	Drum type selector buttons, pressing one causes the sequence for the particular drum to be displayed by the rhythm sequence buttons [24]. This is an alternative input method to the Rhythm Matrix .
24	Rhythm sequence buttons, display the sequence for the currently selected [23] drum type. In pattern mode these can be used to edit the sequence (with tristate behaviour).. This is an alternative input method to the Rhythm Matrix .
25	Drum delay in milliseconds.
26	Drum delay feedback percent.
27	Drum mix level, used to adjust the contribution of the drums into the final mix.
28	Main menu, used to access many menu items.
29	LOOP/PATTERN mode selection toolbutton , pressing it toggles the mode.
30	Pattern to loop toolbutton, pressing it causes the currently selected loop [7,8] to be initialised from the currently selected pattern [5]. Only available in pattern mode.
31	Synth 1, Synth 2 matrix and drum matrix toolbuttons, pressing them takes you to the particular pattern editing matrix. Only available in pattern mode.

Pattern & Loop mode

PocketJam has TWO distinct modes of operation, Pattern & Loop. Switching between pattern and loop mode is accomplished by tapping the Loop icon shown below, try it:



The two screenshots below show how the main synthesizer screen appears in both pattern and loop mode:



Pattern Mode:

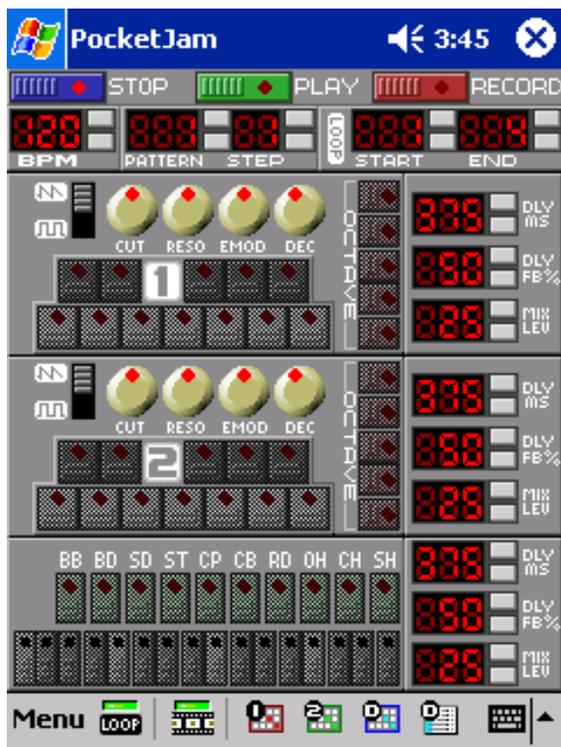
Upon first starting PocketJam, the interface is in Pattern Mode. When in pattern mode you can play with PocketJam as if it were a standalone instrument. There are 256 different patterns, you select each one by using the 'Pattern' LED display.

The concept of sequence does not exist in pattern mode. When you press play, the currently selected pattern is played over and over again.

Pattern mode patterns can be used as a kind of 'sketch pad' for your musical ideas. For example you could have 5 different variations of the same rhythm in 5 different pattern slots.

When in pattern mode you're able to edit the melody and rhythm for each pattern by using the [synth](#) and [drum](#) matrices.

303 fans may want to use the to use the synth buttons to edit the melody; you select which step position you wish to change the note for and then select the note you require by means of the keyboard and octave buttons.



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Loop Mode:

In loop mode, PocketJam will play the loop (START...END) in a cyclic manner so if loop START is 1 and loop END is 4 then pressing play will cause the loop patterns to be played thus:

1,2,3,4,1,2,3,4,1,2,3,4.....

It is important to realise that the patterns that make up a loop are NOT THE SAME patterns that you can play and edit when in pattern mode. See this [worked example](#) in order to clarify things.

Notice that in loop mode, the **red** record button is enabled. Pressing record will cause the loop to play and any user input on the knobs or LED displays will be recorded into the loop data.

The 'control animation' toolbar icon  allows you to disable/enable the animation of the synths controls. It is recommended to have this enabled (green) unless you experience dropout. On slower CPUs or when there are many controls moving at once you may experience audio dropout, in which case you can disable animation.

Note that even with animation disabled, you can still record the control movements, you just can't see the controls movements playing back.

Writing melodies and rhythms in pattern mode

Make sure you're in [pattern](#) mode and press play:



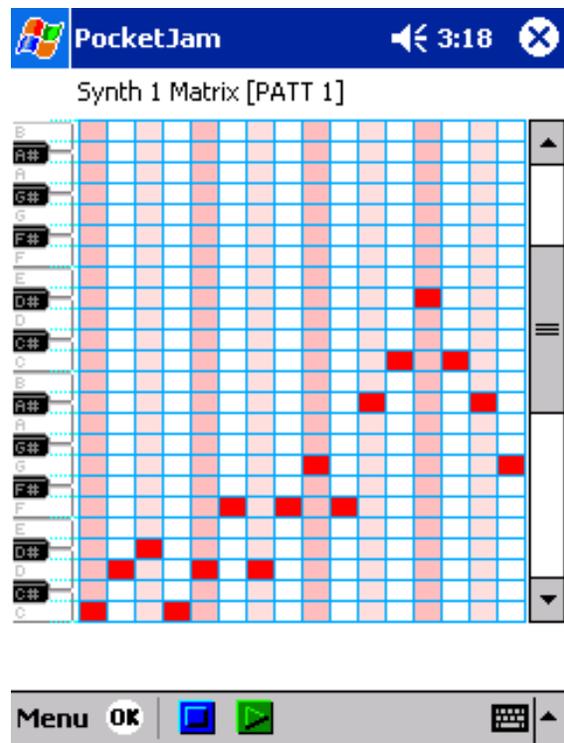
You should now hear sound, that's the sound of the selected pattern playing. The selected pattern number is displayed in the pattern [LED display](#):



O.K. set the pattern number to 1 and let's begin editing the pattern. Make sure that pattern 1 is playing and press the 'synth 1 pattern [matrix](#) icon' as shown:



You should now be presented with the pattern [matrix](#) for synth 1:



The pattern matrix allows you to edit the melody by simply tapping the matrix. If you tap on a note that's already in place then that note will be deleted, in effect this will produce a rest. The matrix resolution is in steps, there are 16 steps per pattern. Try and recreate the melody shown in the matrix above, note the position of the octave scroll bar. When your done, press the 'OK' icon in the bottom left of the screen.

You should now be back at the main synthesizer screen.

Let's make the signal generator of synth 1 produce a square wave, you do this by using the switch as shown:

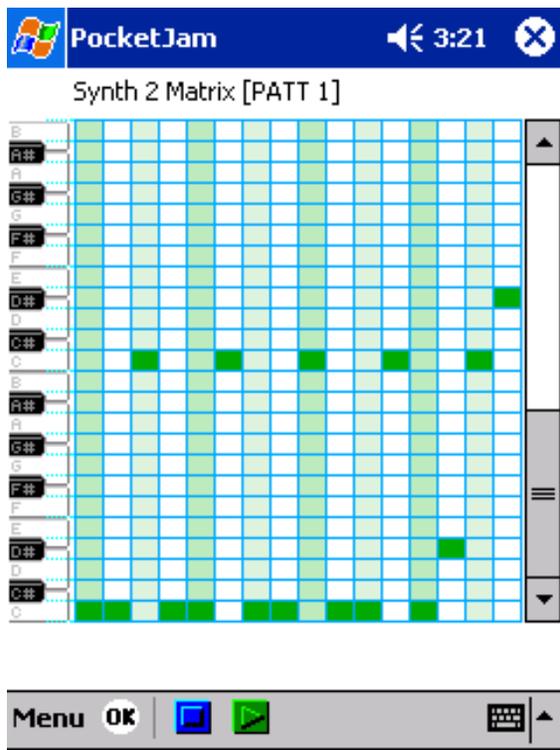
Make sure that you're using the upper switch corresponding to synth 1.



Now it's time to edit the melody for synth 2. Tap the 'synth 2 pattern [matrix](#) icon' as shown:



You should now be presented with the pattern [matrix](#) for synth 2:

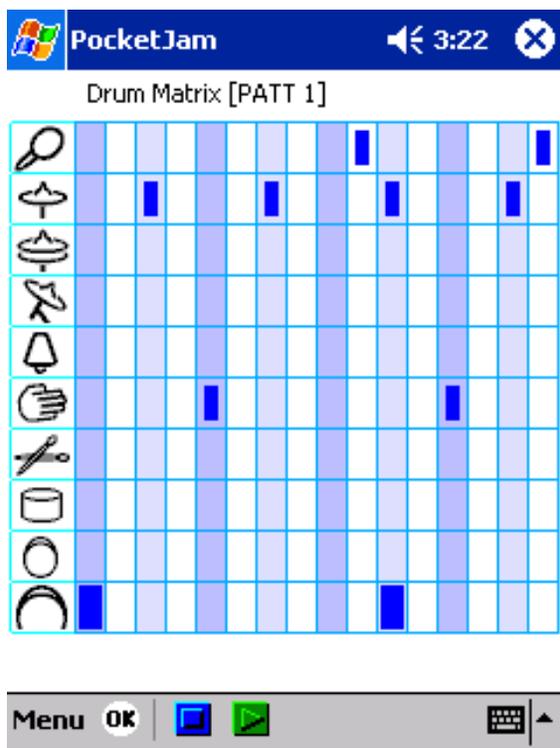


Try and recreate the melody shown in the matrix above. When your done, press the 'OK' icon in the bottom left of the screen.

You should now be back at the main synthesizer screen. OK, let's add some percussion, tap the drum matrix icon as shown:



You should now be presented with the pattern [matrix](#) for the drumkit:



Try and recreate the rhythm shown in the matrix above. When your done, press the 'OK' icon in the bottom left of the screen.

Congratulations, you've succesfully created a new pattern, why not have some fun with it by tweaking the synthesizer knobs whilst it's playing, we recommend tweaking the 'CUT' [knob](#) on synth 1!

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Making loops from patterns

In this example we'll make a 4 pattern loop where positions 1,2 & 3 have the same melody and 4 has a different melody.

First of all set PocketJam to pattern mode, now select pattern 1 and [create a new melody/rhythm](#).

Now select pattern 2 and make a different melody/rhythm.

Now you've got two different patterns, let's make that 4 pattern loop that we mentioned earlier:

Keeping PocketJam in pattern mode select pattern 1.

Now set the loop START and END points:

START=1

END=3

Now tap the Pattern to loop icon:



Tapping this icon causes the selected loop range, in this case 1...3, to be filled with the currently selected pattern, in this case pattern 1. Note that not only the melody and rhythm gets copied but also all of the analog knob positions and the LED numbers for each instrument.

Staying in pattern mode, select pattern 2.

Now set the loop start and end points:

START=4

END=4

Again tap the Pattern to loop icon:



Now let's listen to the new 4 pattern loop that you've created. Set the loop start and end points:

START=1

END=4

Select loop mode, press play, that's it! You should now be hearing the 4 pattern loop being played over and over.

Using these techniques it is possible to build complex loops of any combination of patterns.

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Recording in loop mode

Once you've [created a loop](#) you're able to record the movements of the controls in the [main synth screen](#).

Set the loop start and end points so that the loop you wish to record to is selected.

Put PocketJam into loop mode and press the red record button. You should now hear the selected loop playing repeatedly. Now any movements that you make on the [LED numbers](#) or [knobs](#) will be recorded into the loop.

A control will be recorded for the duration that it is held after a tap, so if you wanted to say set the mix level for the drums at 50 for the whole loop then you'd have to drag the drums mix level to 50 and hold it at that level until you cycle back to the point where you first tapped the mix level.

Note that although the movements are recorded, the knobs do NOT reflect the loop as it is played back, the knobs stay in the position they were in when they were last tweaked, this is because there's simply not enough CPU power on most devices to play the synthesizers whilst moving many controls at once.

There's more than one way to skin a cat, and the same can be said when it comes to composing music with PocketJam.

One method that's easy for beginners follows. In this example we'll create a piece that's 32 patterns long.

[1]

In pattern mode, select pattern 1 and create some melody riffs and a rhythm in it, see [this page](#) if you're unsure about how to do this.

[2]

Now whilst still in pattern mode on pattern 1, set all three mix levels to 0. It's all gone quiet! Don't worry, bear with me!

[3]

Now, again staying in pattern mode, set the loop start and end points to be 1 and 32 respectively and tap the Pattern to loop icon:



[4]

Now, press the blue stop button and switch to loop mode. Adjust the loop end point to 36. This 4 pattern overhang at the end allows us to stop recording before we loop back to the beginning.

[5]

Adjust the pattern and step LED numbers to be both 1.

[6]

Now press record and slowly turn up synth 1 mix lev, aim to have the level at 50 by pattern 4, keep at level 50 until you've reached pattern 33. Now press stop and reset the pattern and step controls to both be 1.

[7]

Now press record and after pattern 4 slowly turn up synth 2 mix lev, aim to have the level at 50 by pattern 8, keep at level 50 until you've reached pattern 33. Now press stop and reset the pattern and step controls to both be 1.

[8]

Now press record and as soon as you hit the beginning of pattern 9, crank the rhythm mix level up to 50 and hold it there until you've reached pattern 33. Now press stop and reset the pattern and step controls to both be 1.

[9]

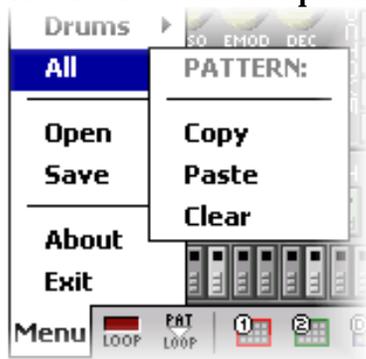
Set the loop start and end points to be 1 and 32 respectively and press play, you should hear your 32 pattern tune playing repeatedly. The slow rise of synth 1, followed by the rise of synth 2, followed by the rhythm kicking in.

Using the techniques described above you can embellish this 32 pattern loop and record some knob movements of your own, try it!

Cutting and Pasting

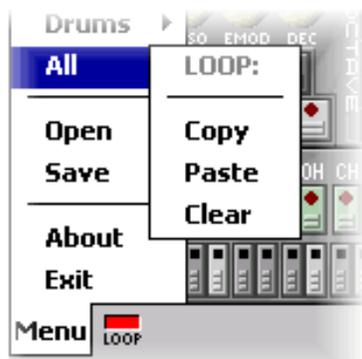
The cut'n'paste functions for PocketJam have been designed with flexibility in mind and are [Pattern/Loop](#) based.

If you're in PATTERN mode then the functions available are pattern based, if you're in LOOP mode then functions are loop based. The menu items are headed to remind you what mode you're in:



PATTERN Mode

All menu items under the PATTERN heading are pattern based.



LOOP Mode

All menu items under the LOOP heading are loop based. This PATTERN/LOOP functionality allows you to do lots of things, for example. you could copy the rhythm out of pattern 2 into loop positions 1 through 16:

Whilst in pattern mode select pattern 2, tap menu item **Menu\Drums\Copy**. Now select loop mode and set Loop START to 1 and loop END to 16. Now tap menu item **Menu\Drums\Paste**.

One should note that the cut and paste functions will also operate across different .JAM files. So, for instance, you're able to copy something out of one .JAM file, and then paste it into another .JAM file. This enables you to create a 'library' of riffs and rhythms in a particular .JAM file and then use a particular riff or rhythm in a new .JAM file by copying it over.

Saving and Loading

Save as .JAM:

PocketJam has it's own compact file type (.JAM) for saving and opening compositions.

When you save a composition in .JAM format, everything gets saved, all 256 bars of loop data, all 256 bars of pattern data and any [imported drum samples](#). The loop start and end points are also saved.

When you open a composition from a .JAM file, you retrieve all that was saved.

Save as .SND:

When you export as a .SND file the tune is rendered to a raw .SND file. Only the tune between the loop start and end points is exported. The .snd file format is:

PCM, 16bit, Mono, Signed, 22050Hz.

Save as .WAV:

When you export as a .SND file the tune is rendered to a .WAV file. Only the tune between the loop start and end points is exported. The wav file format is:

PCM, 16bit, Mono, Signed, 22050Hz.

Note:

The size of both .WAV and .SND files is fairly large and can be calculated by the following formulae:

Size in bytes = Loop Length * (10,813,440 / BPM)

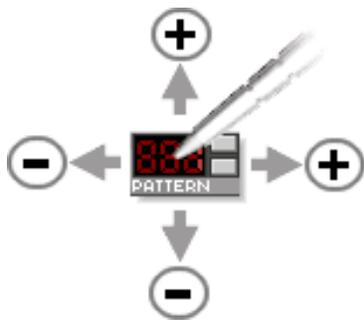
Here's a handy table containing file sizes (in bytes) for different tunes saved as a .SND file:

TUNE MAKEUP	1 bar	64 bars	256 bars
60 BPM	180,224	11,534,336	46,137,344
80 BPM	135,168	8,650,752	34,603,008
100 BPM	108,134	6,920,601	27,682,406
120 BPM	90,112	5,767,168	23,068,672
140 BPM	77,239	4,943,287	19,773,147
160 BPM	67,584	4,325,376	17,301,504
180 BPM	60,075	3,844,778	15,379,114
200 BPM	54,067	3,460,300	13,841,203

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Using LED numerical displays

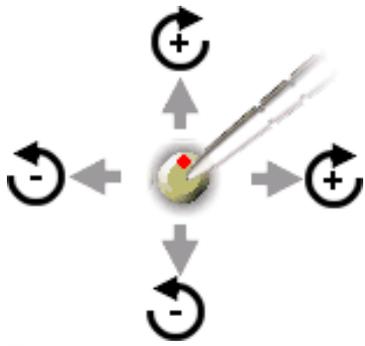
you can change the value of an LED display by either tapping the gray up/down buttons or by tapping the red LED area and dragging. Dragging up or to the right will increase the number, dragging down or to the left will decrease the number, try it:



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Using analog knobs

you can change the value of an analog knob by tapping, holding and dragging it. Dragging up or to the right causes the knob to rotate clockwise and thus increase in value. Dragging down or to the left causes the knob to rotate anticlockwise and decrease in value. Try it for yourself:

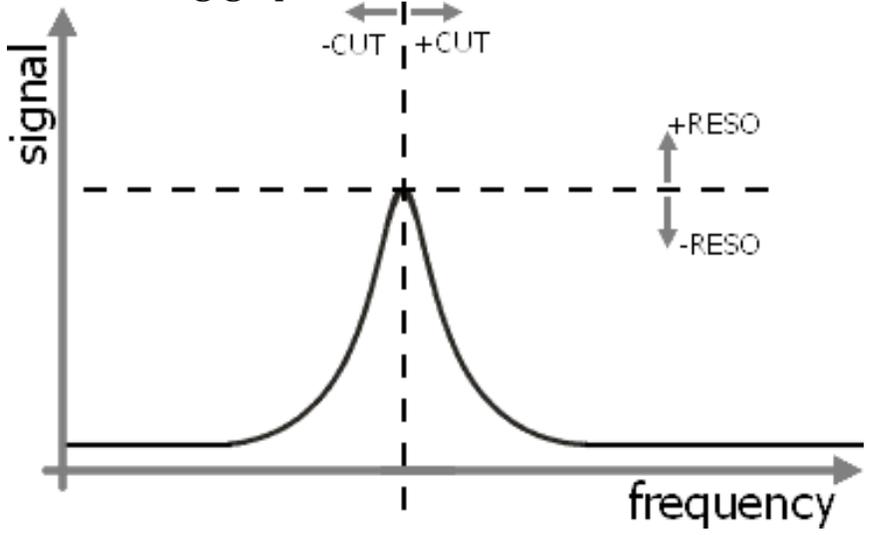


Each knob adjusts a different variable for the relevant synthesizer filter:

CUT:
This knob adjusts the cutoff frequency of the filter.

RESO:
This knob adjusts the resonance of the filter, a filter with higher resonance is more noticeable than a filter with low resonance. The filter 'resonates' at the cutoff frequency.

The following graph shows how CUT & RESO effects the filter in the frequency domain:



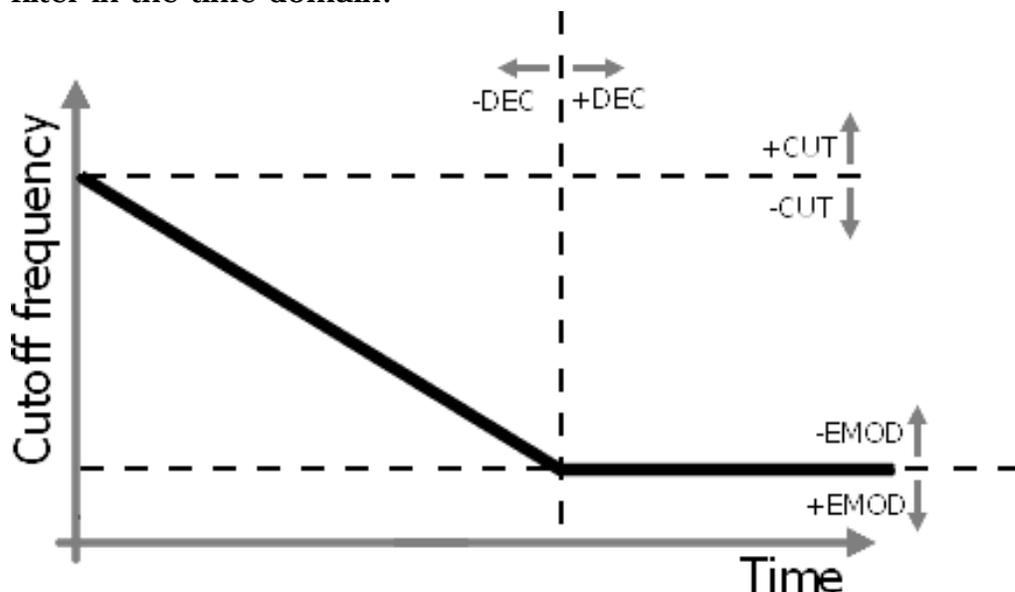
EMOD:

The filter is equipped with a linear decay envelope routed to the internal cutoff frequency variable, the EMOD knob determines how much the envelope should effect the filter. A higher EMOD will make the envelope effect more noticable on the filter.

DEC:

This knob determines the time period that the filters envelope takes to decay.

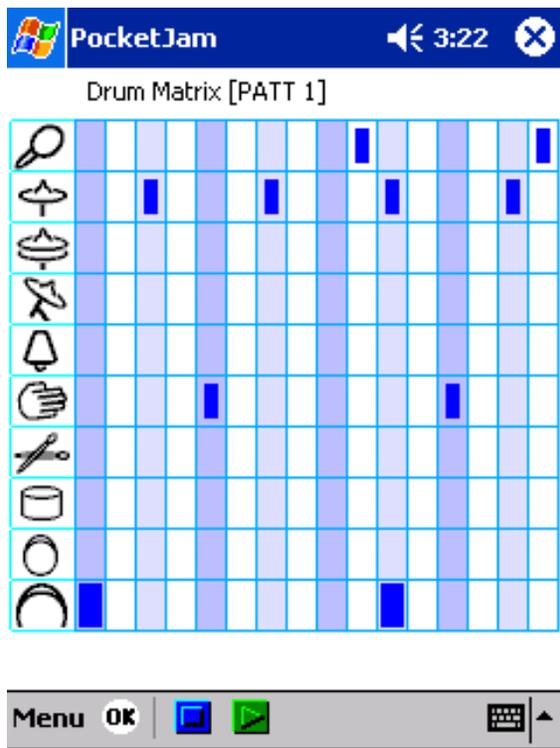
The following graph shows how changing CUT, EMOD & DEC effect the frequency response of the filter in the time domain:



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The rhythm matrix in detail

Below is a screenshot of the drum pattern (rhythm) editing matrix, time progresses from left to right in the matrix:

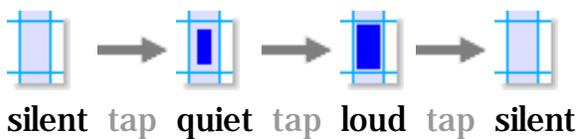


The drum icons in the left column (from top to bottom) represent:

- [1] Shaker
- [2] Closed HiHat
- [3] Open HiHat
- [4] Ride Cymbal
- [5] Cowbell
- [6] Hand Clap
- [7] Stick on Stick
- [8] Snare Drum
- [9] Power Bass
- [10] Deep Bass

In the above screenshot you can see that drum pattern 1 is being displayed, to change the pattern number you use the pattern [LED display](#) in the [synthesizer screen](#).

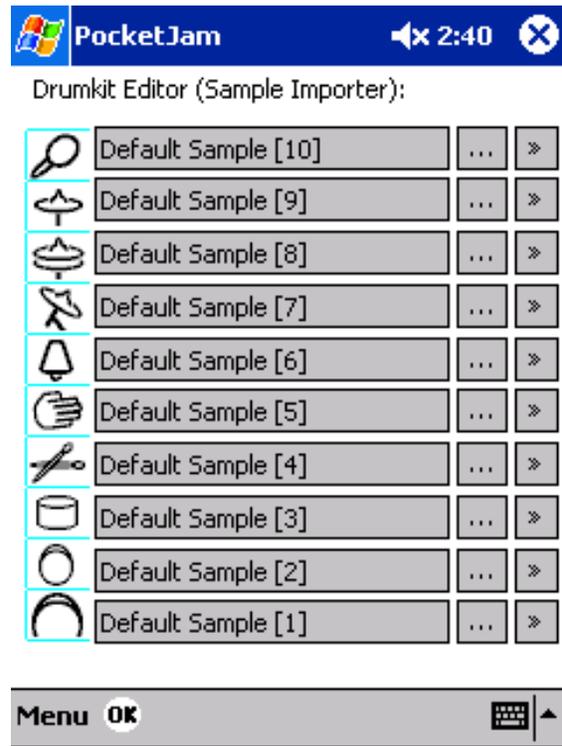
To add a beat to the rhythm you simply tap inside the matrix. Tapping an empty cell once causes a quiet beat to be added, denoted by a small blue rectangle, tapping again causes the beat to be made loud, denoted by a large blue rectangle, tapping again causes the beat to be cleared. Try it:



It is recommended that when creating a rhythm you have the pattern playing so that you can hear the effects of your editing in real time. The pattern is played by pressing the green play button.

Drumkit Editor / Sample Importer

Below is a screenshot of the drum kit editor (sample importer):



To audition a drum sample simply press the corresponding [>>] button. Each drum sample can be changed by pressing the corresponding [...] button to import a new sample. New samples can be imported provided that they are in one of the following formats:

.SND file:

RAW data 22050 Hz signed 16bit mono

.WAV files:

Mono 8 bit unsigned 8000 Hz
 Mono 8 bit unsigned 11025 Hz
 Mono 8 bit unsigned 22050 Hz
 Mono 8 bit unsigned 44100 Hz
 Stereo 8 bit unsigned 8000 Hz
 Stereo 8 bit unsigned 11025 Hz
 Stereo 8 bit unsigned 22050 Hz
 Stereo 8 bit unsigned 44100 Hz
 Mono 16 bit signed 8000 Hz
 Mono 16 bit signed 11025 Hz
 Mono 16 bit signed 22050 Hz
 Mono 16 bit signed 44100 Hz
 Stereo 16 bit signed 8000 Hz
 Stereo 16 bit signed 11025 Hz
 Stereo 16 bit signed 22050 Hz

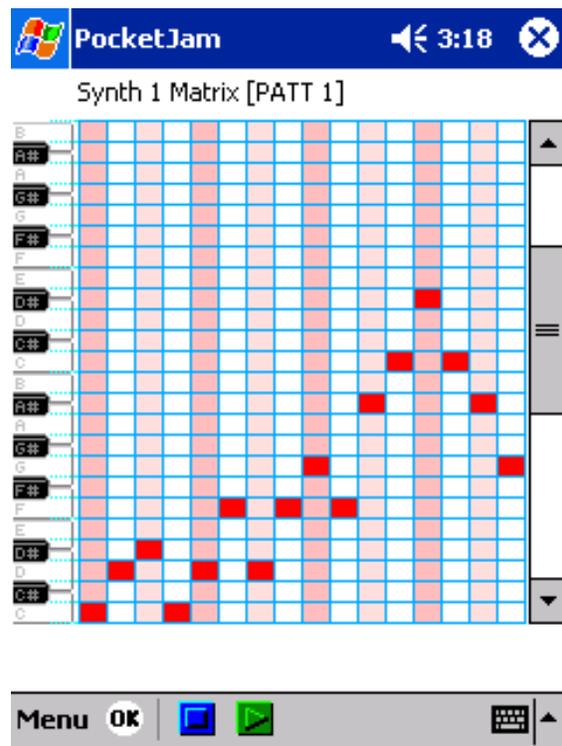
Stereo 16 bit signed 44100 Hz

After a drum sample has been changed by importing a new one then that new sample will be [saved](#) with the JAM file. The only limit to the size of the sample that you can load depends on your devices available program memory.

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The synth matrices [1&2] in detail

Below is a screenshot of the synth pattern editing matrix, time progresses from left to right in the matrix. Here we see the matrix for synth 1:



The icons in the bottom toolbar have the following functions, from left to right:

OK

This takes you back to the main synthesizer screen.

Left arrow

This shifts the melody pattern one step to the left. If a note should drop off the left hand side then it is wrapped to the right.

Right arrow

This shifts the melody pattern one step to the right. If a note should drop off the right hand side then it is wrapped to the left.

Up arrow

This transposes the melody pattern up by one semitone, if a note in the pattern reaches the ceiling then it does not transpose any higher.

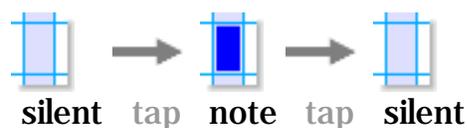
Down arrow

This transposes the melody pattern down by one semitone, if a note in the pattern reaches the floor then it does not transpose any lower.

Clear

Tapping this will cause all beats in the rhythm to be deleted, in effect it clears the melody.

To add a note to the melody you simply tap inside the matrix. Tapping an empty cell once causes a note to be added, denoted by a red/green rectangle, tapping again causes the note to be cleared. Try it:



It is recommended that when creating a melody you have the pattern playing so that you can hear the effects of your editing in real time. The pattern is played by pressing the play button in the [synthesizer screen](#).

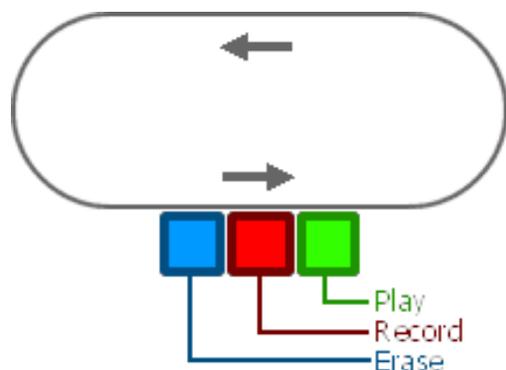
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The delay units explained

The delay units can be seen on the right hand side of the main [synth screen](#). Each of the three instruments has its own delay unit as described in the [signal flow schematic](#).

The delays parameters, consisting of delay time and delay feedback, are adjusted by means of [LED displays](#).

To better understand the operation of a digital delay, you can think of it as being similar to the wonderful old tape delay units as used by ambient pioneers like Brian Eno and Robert Fripp. These tape delays consist of a length of audio tape made into a loop. Within the unit are three heads; one to **R**ecord, one to **P**lay back and one to partially **E**rase what's there, study the diagram below:



The erase head on the tape delay is variable which means that as the tape goes past, the recorded audio is diminished by a certain amount. Now let's imagine that a piano note is recorded onto the loop, the original note is almost instantly played as it passes the play head, the note then travels round the loop until it reaches the erase head, at which point it is diminished in volume by say 50%. The note continues round the loop, past the play head again, it plays at 50% volume and continues.... We hear the piano note 'echoe' as it travels round the loop, and over time the piano note become just a ghostly presence on the tape as it's volume tends toward zero.

The digital delay units in PocketJam work in the same way as the tape loop described above. Changing the **DLY ms** variable is like changing the length of the loop of tape. Changing the **DLY FB%** variable is like changing the strength of the erase head, turning the feedback up is the same as lowering the strength of the erase head.

Tricks with delays:

To make a cool 3/4 time delay then set the **DLY ms** variable according to this formula:

$$\mathbf{DLY\ ms} = 45000 / \mathbf{BPM}$$

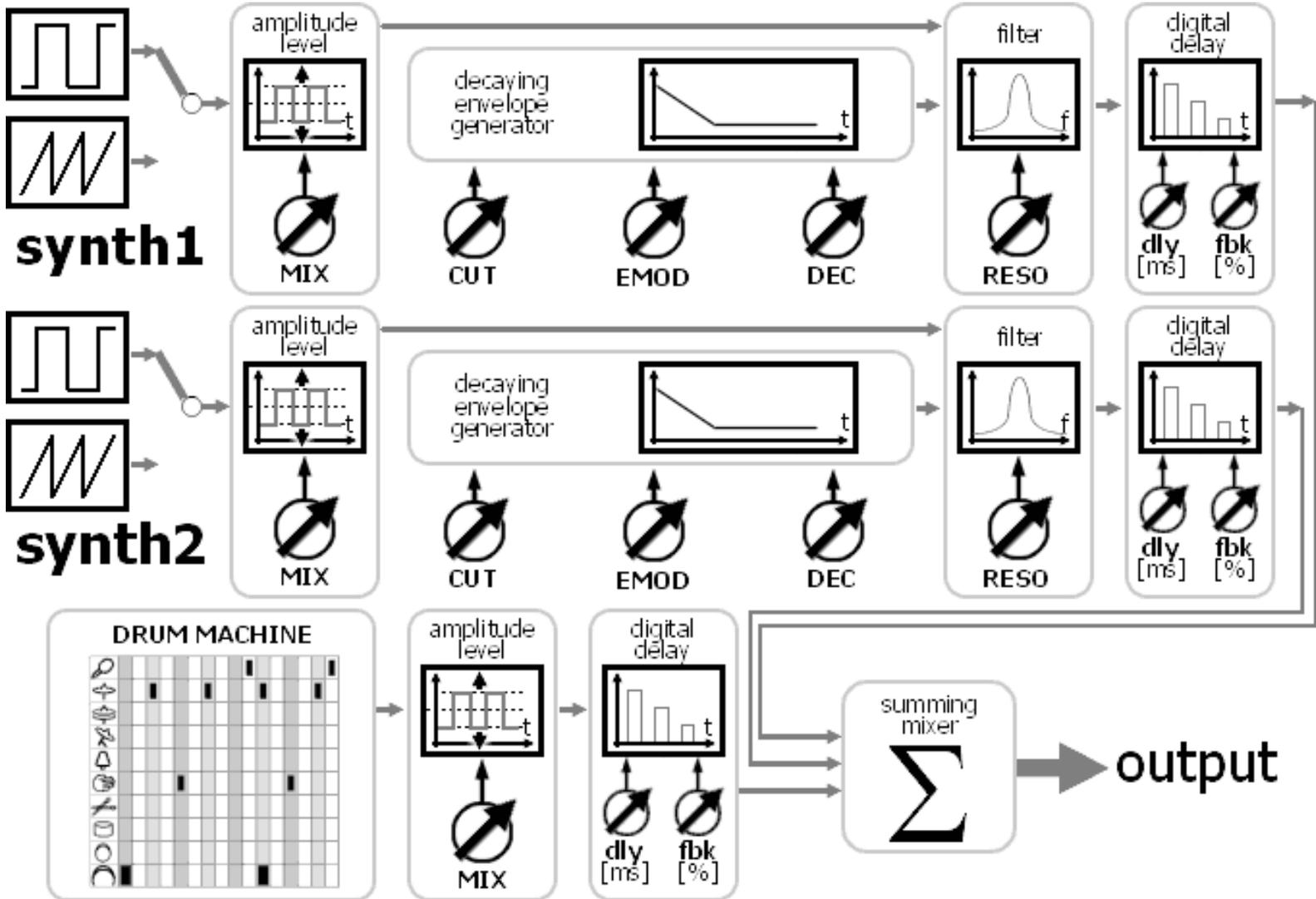
This is great for use on repetitive riffs that have a 4:4 time signature.

Try setting the **DLY ms** variable to a low level like 15ms and turning the **DLY FB** up to a high level like 97%, you should hear the delay 'ringing' at a frequency determined by DLY ms. By tuning the DLY ms you can make it harmonise with the root of the riff playing through the delay.

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Signal flow schematic diagram

Below you can see signal flow diagram for PocketJam. every variable control, denoted by a circle with a diagonal arrow, is under full control of the sequencing engine. The internal signals are 32bit, the output is mono 16bit at 22050Hz.



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