



Public Beta 1 (09/28/2008)

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What is GrooveStep?

GrooveStep is a portable sample based step sequencer and that allows people to write music anywhere with the Nintendo DS. GrooveStep is not a game, but it is an application for writing music.

To get the most out of GrooveStep, you should be familiar and understand the following concepts: Nintendo DS homebrew hardware, step sequencing, sample editing, LFOs, ADSR envelopes.

This manual assumes you have the proper hardware and know how to get GrooveStep up and running. Please consult the internet if you need help. If your hardware doesn't support DLDI auto-patching, you will have to do it manually.

GrooveStep Features

16 tracks - 2 sounds per track, 2 LFOs per track, ADSR envelope for each sound
16 patterns - 1-64 steps per pattern, 1x/2x/4x playspeed
255 pattern length arrangement with 16 track mutemap, play speed override, last step override per arrangement step
Up to 2MB of ram available for sounds. Future versions will expand this to 3MB or more.

PLEASE NOTE:

Real tempo is actually just slightly less than the reported tempo. This is due to the interrupt system on the DS.

Terminology

Sound Bank – this means a sub-directory within the Banks directory which contains sounds.

About the Beta

This is a beta release so there is still some work to be done, mainly in the area of the user interface. It is still a very usable application. If you have suggestions on how to improve GrooveStep please join the GrooveStep google group.

Support

There is a private google group set up for GrooveStep during the beta. To join please visit <http://groups.google.com/group/groovestep>

Installing GrooveStep

Copy the GrooveStep.nds (or .sc.nds for SuperCard users) file and GrooveStep directory (from the DS folder in the archive) to the root of your flash card.

The file structure should look like this:

```
GrooveStep.nds <- application
GrooveStep\ <- main GrooveStep directory
    |-Banks\ <- holds sub dirs containing sounds (.raw and .ton)
    |     |-Demo\ <- demo bank for demo song
    |- Songs\ <- where all songs are stored (.grv)
```

GrooveStep File Types

.grv - GrooveStep song file format

.raw - RAW sample file format

.ton - tone file format (generated by the tonegen application)

FILE SYSTEM LIMITATIONS

ALL DIRECTORY AND FILES NAMES SHOULD BE NO LONGER THAN 30 CHARACTERS (not including the file extension). There should be no more than 256 files of any one type in a directory. So max 256 songs in the song dir, 256 sound banks sub directories, 256 .ton and 256 .raw files in a single sound bank directory.

Sound File Format Technical Details

There are currently 2 types of audio files supported in GrooveStep: **Samples** and **Tones**. All audio is 16 bit. If you want to get a lo-fi sound like 8 bit, just render your samples as 8 bit, and resample them back up to 16 bit before exporting to RAW format.

SAMPLES

Samples are just regular RAW format sound samples. You can use a freeware application like Audacity to convert your sound files to the proper format.

SAMPLE FORMAT:

RAW file format, 44,100 kHz, 16-bit signed, little endian (intel) byte order

TONES

Tones are specially generated sample files created with the ToneGen program. ToneGen takes a RAW sound file of a very high resolution single cycle oscillation and outputs a proper formatted file that can be used by GrooveStep.

TONE FORMAT:

RAW file format, variable kHz, 16 bit signed, little endian (intel) byte order, 12793 samples = 25586 bytes

ToneGen

GrooveStep comes with a Windows C# command line application called ToneGen which is used to generate .ton files that can be used with GrooveStep. You will need to install the Microsoft .NET framework if you don't have it. Also, the source is included so anyone can mess with the code and make their own version or port to other platforms.

There is a sample batch file called *buildtones.bat* which generates .ton files from some sample tones. If you open up the .raw and generated .ton files in a sound editor, you can get an idea of how the tone file is built from the original raw sound.

Tones are intended to be single cycle oscillations, but there is nothing stopping you from trying different types of files to get different results. You can even reverse the data in a tone file to get some glitchy sounding results, but that has to be done outside of GrooveStep.

Getting Started

Checking Out The Demo Song

1. If you are not at the Song screen then go there. (L-Button to bring up screen selection)
2. Click the LOAD button and select DemoSong from the list and hit the SELECT button.
3. Go to the Arranger screen.
4. Click on the SONG button.
5. Click on the PLAY button.

Tracks 1-3 use samples while tracks 4 and 5 use tones.

Adding Your Own Sounds

The process to get your own sounds into GrooveStep is fairly simple.

1. Gather your .raw and .ton sound files.
2. Create a sound bank sound directory inside the “Banks” directory.
3. Copy your sound files inside your new directory.

Creating A New Song

The first step of creating a new song, is selecting the sound bank for that song. All sounds for a song must be loaded from the same sound bank.

1. Go to the Song screen.
2. Click on the grey bar under “BANK NAME:”, select a sound bank from the list and click the SELECT button.
3. Go to the Track Editor screen.
4. Go to the SOUNDS->SND1(or SND2)->SOURCE tab and click on the LOAD button.
5. Select a sound from the list and click the SELECT button.

Now you can play the sound from the keyboard at the bottom of the screen and tweak the sound parameters. When you are happy with the results, go to the Pattern screen and start inputting a pattern for the track.

MAIN CONTROLS

L TRIGGER - bring up pop-up screen (screen navigation, pattern/song options, copy/paste, options screen)

START - start/stop playback

DPAD - change/edit selected slider control when a control is highlighted, left/right change current pattern on PATTERN SCREEN if no control is highlighted

TOUCHSCREEN - everything else QUICKSTART

At the top of the bottom screen (pattern editor screen), there is a row of circles. Those represent the tracks. The first 5 circles have sounds assigned to them. Tap them to hear the sound playback. If there are 2 sounds mapped to that track, playback will toggle between the sounds. The top screen (overview screen) displays the names of the sounds and highlights the current selected sound.

Start playing with the sliders to change the volume (unless you select a different Groove Slider Tab). If you want to change patterns, first make sure no slider is selected. When a slider is selected, it will be highlighted with a yellow box. To deselect it, just tap the L TRIGGER to make the POP-UP SCREEN appear momentarily.

The GrooveStep Screens

OVERVIEW SCREEN (top screen)

01: 909 Kick	09: (none)
(none)	(none)
02: 909 Clap	10: (none)
(none)	(none)
03: 909 C-Hat	11: (none)
909 O-Hat	(none)
04: saw	12: (none)
sine mul	(none)
05: sine	13: (none)
sine tri	(none)
06: (none)	14: (none)
(none)	(none)
07: (none)	15: (none)
(none)	(none)
08: (none)	16: (none)
(none)	(none)
CURRENT TRACK: 1 SOUND: 1	
SOUND NAME: 909 Kick	
PATTERN: 1/16	
TEMPO: 120	
PLAY SPEED: 0x LAST STEP: 16	

SONG SCREEN

The image shows a black rectangular interface with three horizontal gray bars. The first bar is labeled "SONG NAME:" in white text. The second bar is labeled "ARTIST NAME:" in white text. The third bar is labeled "BANK NAME:" in white text. Below these bars, there are three white rectangular buttons labeled "NEW", "LOAD", and "SAVE" in black text, arranged horizontally.

This screen contains the song info in addition being to the place where you load, save and initialize new songs.

SONG NAME – click on the gray bar below “SONG NAME:” to enter the text entry screen for this value

ARTIST NAME – click on the gray bar below “ARTIST NAME:” to enter the text entry screen for this value

BANK NAME – click on the gray bar below “BANK NAME:” to enter the sound bank directory selection screen.

NEW – clears out the current song in memory and initialized everything to a default state.

LOAD – open the file selection screen to select a song to load

SAVE – open the text entry screen to edit the song file name to save.

POP-UP SCREEN (screen navigation)



Holding down the L TRIGGER will bring up the POP-UP screen which has 4 tabs:

SCREEN - allows for quick screen navigation

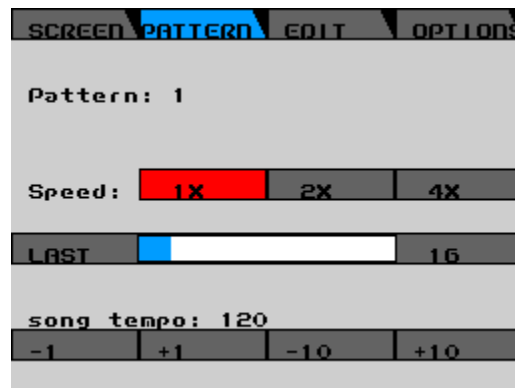
PATTERN - pattern/song settings

EDIT - copy/paste options

OPTION - not currently used

The FILE, SONG and JAMMER screens are disabled for this version.

POP-UP SCREEN (pattern settings / song tempo)



This screen gives quick access to pattern settings and the song tempo

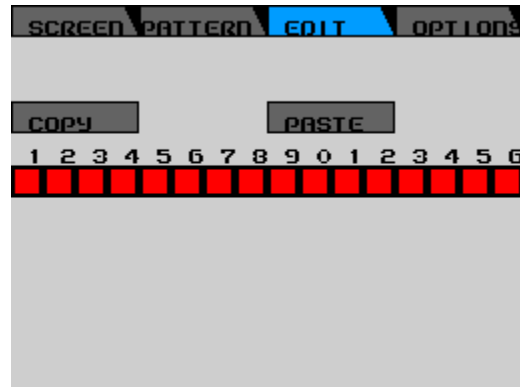
PATTERN - displays the current pattern number (1-16)

SPEED - controls the speed playback for the pattern (1x, 2x, 4x)

LAST - controls the last step for the pattern (1-64)

SONG TEMPO - controls the song tempo

POP-UP SCREEN (edit - pattern copy/paste)



This screen gives quick access to pattern copy/paste controls

COPY - will set the current pattern as the source for a copy/paste function

PASTE - will perform the paste into the current pattern

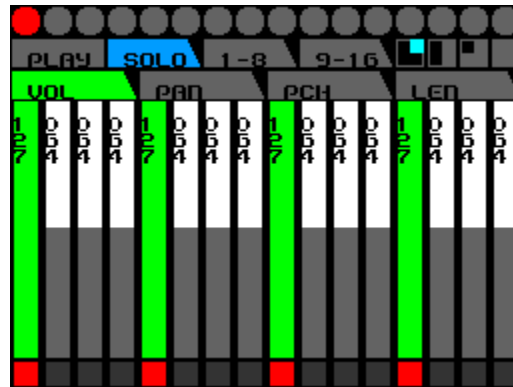
TRACK NUMBERS - can be used to filter which tracks are copied from the source

POP-UP SCREEN (options)

This inappropriately labeled screen actually reports the memory usage of all samples loaded in memory. You can also get a summary of total memory usage and how much is still available at the bottom.

SCREEN		PATTERN	EDIT	OPTIONS
01:	0:0		09:	0:0
02:	0:0		10:	0:0
03:	0:0		11:	0:0
04:	0:0		12:	0:0
05:	0:0		13:	0:0
06:	0:0		14:	0:0
07:	0:0		15:	0:0
08:	0:0		16:	0:0
	0:0			0:0
SAMP RAM:		2097152		
USED RAM:		0		
FREE RAM:		2097152		
SongSize:		77604		

PATTERN SCREEN (solo track view)



This is the main pattern editing screen

TRACK BUTTONS - top row selects the track/sound to edit - red = sound one, blue = sound two

PLAY BUTTON - starts/stop playback

SOLO BUTTON - sets the edit mode to solo track view with slider editor

1-8/9-16 BUTTONS - sets the edit mode to multi track view with step buttons (see next screen)

PAGE BUTTONS - sets the page for the pattern (1-4)

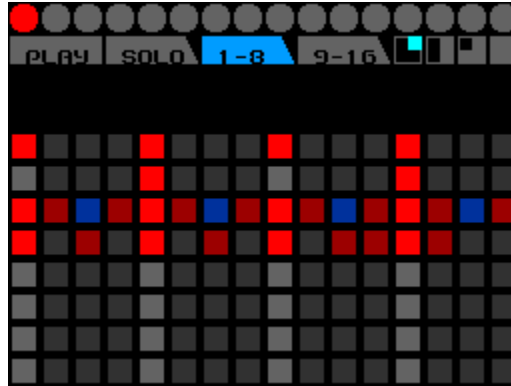
GROOVE SLIDER TABS - selects which of the 4 sliders to currently view/edit

GROOVE SLIDERS - actual step sliders

GROOVE STEP BUTTONS - selects which sound (red, blue) to play at any given step

***The GrooveStep concept: each step in the sequencer can have up to 4 "groove" sliders associated with it. The groove sliders are selected on the TRACK SCREEN. This allows for varied step sequences which can have different volume, pan, etc., settings for each step.

PATTERN SCREEN (8 track view)



This is the multi track view of the pattern screen

TRACK BUTTONS - top row selects the track/sound to edit - red = sound one, blue = sound two

PLAY BUTTON - starts/stop playback

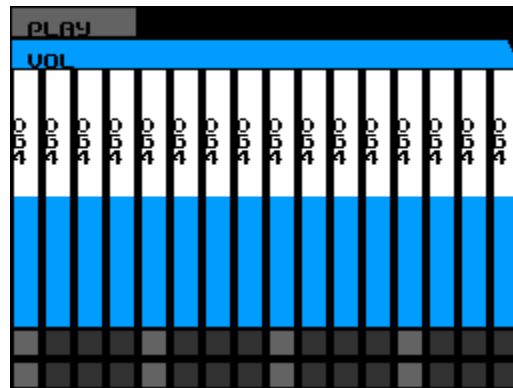
SOLO BUTTON - sets the edit mode to solo track view with slider editor

1-8/9-16 BUTTONS - sets the edit mode to multi track view with step buttons)

PAGE BUTTONS - sets the page for the pattern (1-4)

GROOVE STEP BUTTONS - selects which sound (red, blue) to play at any given step

MIXER SCREEN



This screen allows for fine tuning of the volume settings for the tracks

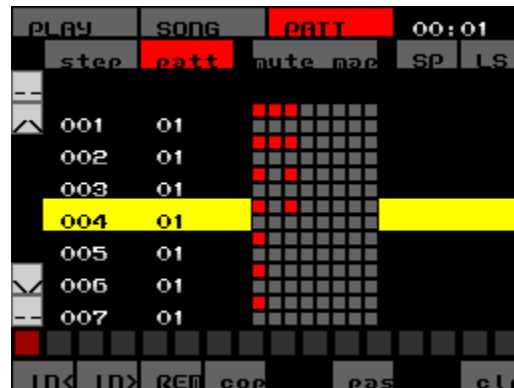
PLAY BUTTON - starts/stop playback

VOLUME SLIDERS - sets the volume for the track

MUTE BUTTONS - mutes the current track

SOLO BUTTONS - solos the current track

ARRANGER SCREEN



This is the screen where patterns can be arranged into a song

PLAY BUTTON - starts/stop playback

SONG BUTTON - sets the playback mode to song

PATT BUTTON - sets the playback mode to pattern

TIME DISPLAY - displays the current play time

PATT EDIT BUTTON - sets the edit mode to PATTERN

MUTE MAP BUTTON - sets the edit mode to MUTE MAP

SP BUTTON - sets the edit mode to SPEED OVERRIDE

LS BUTTON - sets the edit mode to LAST STEP OVERRIDE

TOP ARRANGEMENT BUTTON - jumps to the top of the ARRANGEMENT

UP ARROW BUTTON - moves one step up in the ARRANGEMENT

SCRUB BAR - scrub through the ARRANGEMENT

DOWN ARROW BUTTON - moves one step down in the ARRANGEMENT

BOTTOM ARRANGEMENT BUTTON - jumps to the bottom fo the ARRANGEMENT

EDITOR ROW [4 modes]:

PATTERN - sets the pattern for the current arrangmennt step

MUTE MAP - edits the mute map for the current arrangement step

SPEED OVERRIDE - sets the play back speed for the current arrangement step

LAST STEP OVERRIDE - sets the pattern last step of the current arrangement step

INSERT BEFORE BUTTON - inserts a new arrangment step before the current position

INSERT AFTER BUTTON - inserts a new arrangement step after the current position

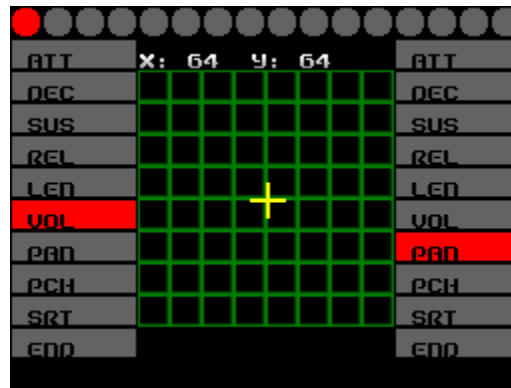
REMOVE - remove the current selected arrangement step

COPY - copy the current step settings

PASTE - paste the current step settings

CLEAR - clear the current step setting

XY PAD SCREEN - live performance screen



This screen allows for realtime parameter override during playback

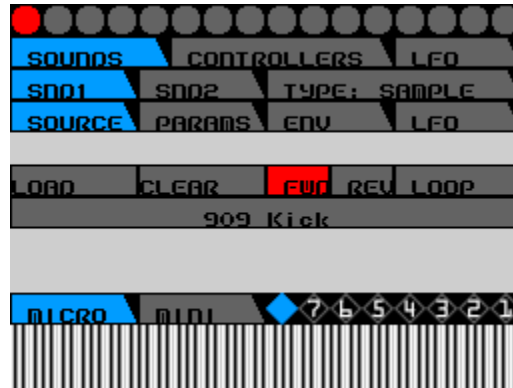
TRACK BUTTONS - top row selects the track/sound to edit - red = sound one, blue = sound two

LEFT SIDE PARAM SELECTION (X COORD) - select which param the X coord represents

RIGHT SIDE PARAM SELECTION (Y COORD) - select which param the Y coord represents

XY PAD - move the stylus on this pad to change the value in realtime

TRACK SCREEN OVERVIEW



This is the screen where sounds are selected/loaded and their parameters are set
TRACK BUTTONS - top row selects the track/sound to edit - red = sound one, blue = sound two

The 3 main tabs are:

SOUNDS - this tab has all the parameters for the sounds for each track

CONTROLLERS - this is where you set which parameters the GrooveSliders are mapped to in the pattern editor LFOS - each TRACK HAS 2 LFOS and each SOUND can use both LFOS as modulation sources

There is also a dual mode keyboard at the bottom for auditioning sounds.

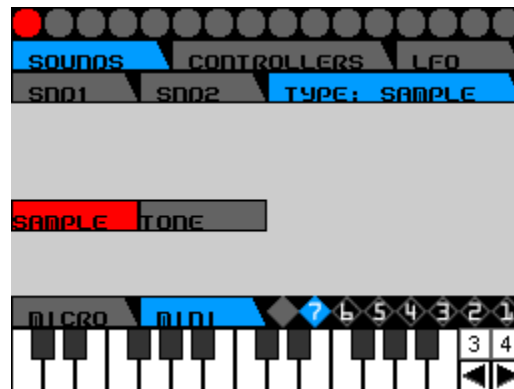
MICRO MODE - each 2 pixels represent 1 note so you get access to the full 128 notes (just like MIDI!)

MINI MODE - a 2 octave keyboard with octave UP/DOWN buttons

RANGE BUTTONS (*, 7, 6, 5... 1) - These buttons select how many octaves are mapped across the 128 KEYS - ONLY AVAILABLE FOR SAMPLES (and NOT TONES).

* is the standard mapping (10.666667 octaves), the 1-7 values are useful for sounds where you need more pitch control

TRACK SOUND TYPE



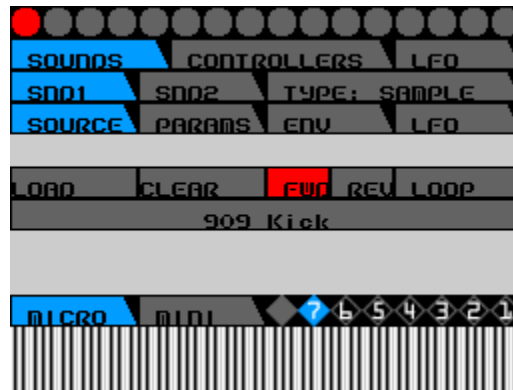
There are currently 2 types of sounds supported: SAMPLES and TONES

SAMPLES are normal samples and will be in a 44100kHz 16bit RAW format

TONES are specially processed single cycle oscillator samples. The converter application and source code will be provided later so people can make their own TONES

Switching modes will clear out any sounds previously loaded in the track and reset parameters

TRACK SOUND SOURCE



LOAD - load a sound

CLEAR - clear the sound

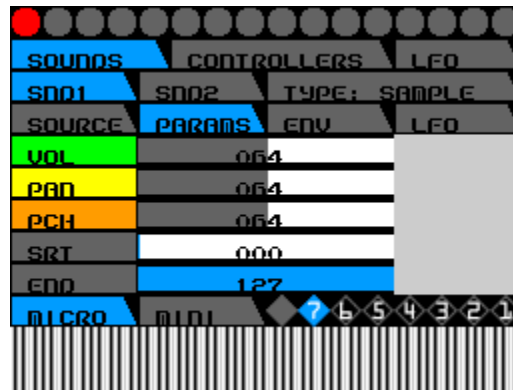
SAMPLE ONLY CONTROLS:

FWD - set the play direction to forward

REV - set the play direction to reverse

LOOP - toggle loop mode for the sample

TRACK SOUND PARAMS



VOL - controls the sound volume

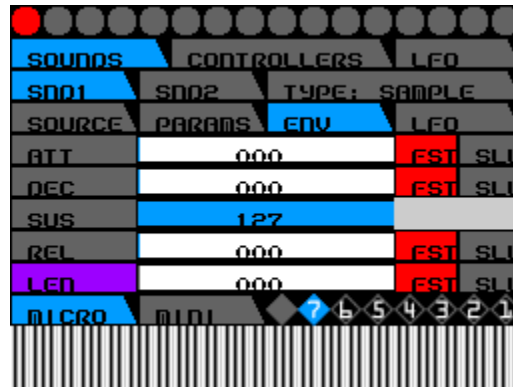
PAN - controls the sound pan (stereo)

PCH - controls the sound pitch

SRT - trims the sound length from the start of the sample (SAMPLE ONLY)

END - trims the sound length from the end of the sample (SAMPLE ONLY)

TRACK SOUND ENV (ENVELOPE)



ATT - attack time

DEC - decay time

SUS - sustain level

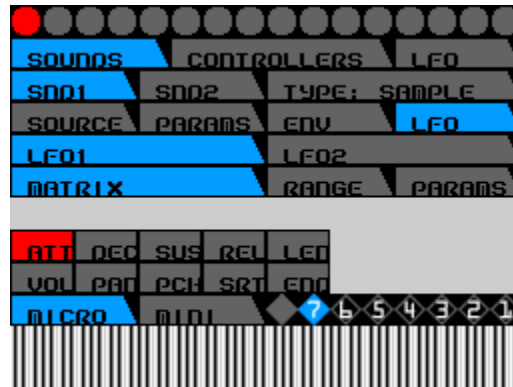
REL - release time

LEN - note len (leave at 0 to play entire SAMPLE)

FST - set the time mode to FAST (10x the slow speed)

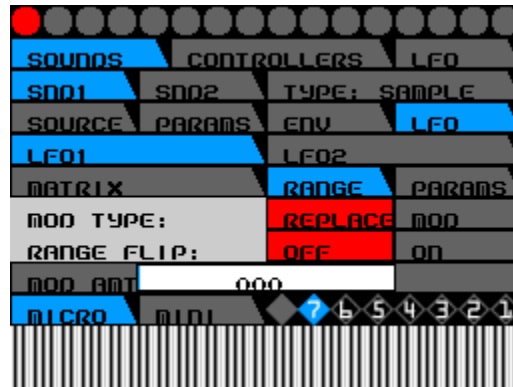
SLW - set the time mode to SLOW (1/10th the fast speed)

TRACK SOUND LFO MATRIX



Select which parameter the LFO is mapped to

TRACK SOUND LFO RANGE



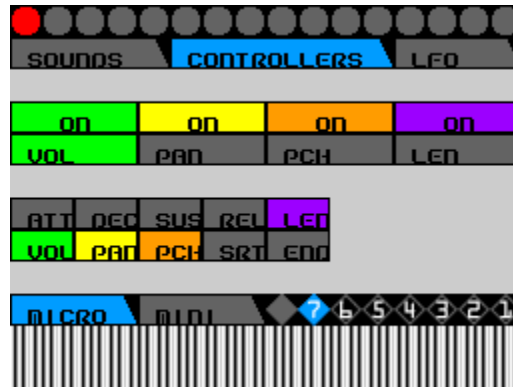
MOD TYPE - REPLACE overwrites the parameter value, MOD modulates the parameter
 RANGE FLIP - inverts the LFO value MOD AMOUNT - how much will the LFO affect
 the parameter (0-127)

TRACK SOUND LFO PARAMS

SOUNDS	CONTROLLERS	LFO
SND1	SND2	TYPE: SAMPLE
SOURCE	PARAMS	ENV
VOL	064	
PAD	064	
PCH	064	
SRT	000	
ENV	127	
MICRO	MIDI	7 6 5 4 3 2 1

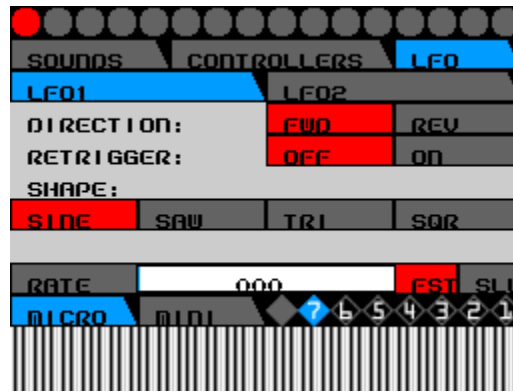
FREQ DROPOUT - only works for the PCH modulation, but it will create a "broken" LFO that will allow the frequency to drop to 0. Originally a coding error, but it created a nice low-fi sound.

TRACK CONTROLLERS



You can configure what parameter the 4 GrooveSliders are mapped to and even turn them on/off

TRACK LFO



Each track has 2 LFOs that can be used to modulate sound parameters to give them more life.

DIRECTION - which direction the LFO plays (same behavior as inverting)

RETRIGGER - retrigger the LFO with every note on

SHAPE - select the shape of the LFO

RATE - 0-127 where 0 is off. **FST/SLW** - select FAST or SLOW rates. - I will provide more exact details (Hz at a later time)