

**Bass Station II v2.5**  
**New Features User Guide**

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## Adjustable Filter Tracking

Filter tracking can now be adjusted by holding the function key and pressing the ModWheel-Filter Freq key twice. The display will change to:

F-0

This means that filter tracking is fully on. Use the patch value buttons to change this value in the range 0:7, where 0 is full filter tracking and 7 is no filter tracking.

The filter tracking setting can be saved per-patch. By default it is always fully on.

## Paraphonic Mode

Paraphonic mode can be enabled by holding the function key and pressing Osc1-2 Sync twice. The display will change to:

P-0.

Use the patch value buttons to enable (P-1) or disable (P-0) paraphonic mode.

The paraphonic mode can be saved per-patch. By default paraphonic mode is always off.

## Micro-Tuning

New micro-tuning support gives you complete control of the frequency triggered by each keypress.

Re-tuning is performed at the very front of the signal chain, so all modulation will behave exactly as it did before, and all patches will behave the same.

There are 9 tuning tables on the device. All can be modified, but only the last 8 can be saved. On startup, the first table is always initialised to be the standard midi keyboard. Select the currently active tuning table by holding Function, and pressing the Tune key twice. The screen will change to:

t-0.

Use the patch value buttons to choose between 9 tuning tables. The active tuning table can be saved with the patch. The default tuning table will always be 0.

## Tuning Tables

Included with the 2.5 firmware update are 8 tuning tables:

### 1. Prime (5 Notes per octave)

The prime pentatonic mode with no semitones. It uses both the “large” and “small” whole-tone (204¢ and 182¢, respectively).

9/8 5/4 3/2 5/3 2/1

### 2. Harmonic Series (6 Notes per octave) (432Hz)

Harmonics 6 to 12 of the harmonic series.

9/8 5/4 11/8 3/2 7/4 2/1

### 3. Indian (22 Notes per octave)

Traditional Indian Shruti scale.

256/243 16/15 10/9 9/8 32/27 6/5 5/4 81/64 4/3 27/20 45/32 729/512 3/2 128/81 8/5 5/3 27/16 16/9 9/5 15/8 243/128 2/1

### 4. Ptolemy (7 Notes per octave)

Ptolemy's Intense Diatonic Syntonon. Also known as Zarlino's scale.

9/8 5/4 4/3 3/2 5/3 15/8 2/1

### 5. Chinese Bianzhong (12 Notes per octave)

Pitches of Bianzhong bells (Xinyang)

104 308 624 820 1012 1144 1329 1515 1857 2039 2231 2674

### 6. Turkish (7 Notes per octave)

Turkish scale with 5 limit tone system, harmonic minor inverse.

16/15 5/4 4/3 3/2 5/3 16/9 2/1

### 7. Dan Schmidt's Slendro Pelog (7 Notes per octave) (pelog/white slendro/black)

Heptatonic Pelog on white keys, pentatonic Slendro on black keys.

### 8. Carlos Super (12 Notes per octave)

Wendy Carlos' super just intonation scale

17/16 9/8 6/5 5/4 4/3 11/8 3/2 13/8 5/3 7/4 15/8 2/1

Tuning tables map each of the 128 MIDI notes to different frequencies. The tables can be modified using sysex, using the real-time MIDI tuning message:

**F0 7F id 08 02 tt ll [kk xx yy zz] F7**

Where:

- F0 7F = universal realtime SysEx header
- id = target device ID, which for us is 0x00.
- 08 = sub-id #1 (MIDI tuning standard)
- 02 = sub-id #2 (note change)
- tt = tuning program number from 0 to 127
- ll = number of notes to be changed (sets of [kk xx yy zz])
- [kk xx yy zz] = MIDI note number, followed by frequency data for note
- F7 = end of SysEx message

The frequency data is described by:

- kk = MIDI note number
- xx = New MIDI note number
- yy = detune in 100 cents / 128 steps.
- Zz = detune in 100 cents / 16384 steps.

For example, to detune A4 (note number 0x45) to B4 (note number 0x47), in the first tuning table, send:

```
F0 7F 00 08 02 00 01 45 47 00 00 F7
```

To shift the note A4 sharp by 50 cents, in the second tuning table, send:

```
F0 7F 00 08 02 01 01 45 45 40 00 F7
```

When notes are retuned, the effect is immediate, so holding a note and changing the tuning will result in an audible change in pitch.

Multiple tunings can be sent in a single message by changing the entry for the number of notes to be changed. For example, to shift A4 to B4 and B4 to C5 send:

```
F0 7F 00 08 02 00 02 45 47 00 00 47 48 00 00 F7
```

It should be possible to play Scala tuning dumps to your BSII.

**Don't forget to save your tuning tables.** Do this by pressing save when you're on the tuning table-select page (function + Tune twice). Otherwise any modifications made to the tables will be lost.

An absolute lower limit on our tuning accuracy is a semitone/256. This means only the top bit of the detune in 16384 steps value will be observed. In practical terms we can achieve sub-cent accuracy.

## Tuning Morphing

It's possible to morph in real-time between different tuning tables. Hold function and press the Tune key twice. This parameter screen will not time out, to allow it to be used for performance reasons.

Turn up the glide time, hold some notes (try paraphonic mode) and switch between the tuning tables to hear the effect of morphing between tunings.

## Table Selection

It's possible to select the current tuning table using the MIDI tuning program change RPN.

To do this send:

```
B0 64 03 65 00 06 tt 64 7F 65 7F
```

where:

B0 64 03 65 00 : select the MIDI tuning program change RPN  
06 tt : select the tuning table number, where tt is [0:9] for us.  
Rest of the message disables the RPN controller selection.

## Table Save

The tuning tables can be saved using a single sysex message:

```
F0 00 20 29 00 33 00 48 F7
```

## Envelope Retriggering

It's now possible to configure both your mod and/or amplitude envelopes to retrigger once the decay stage has ended. This can be turned on and off by holding the Function key and pressing the Velocity-AmpEnv (for amplitude envelope looping) or Velocity-ModEnv (for modulation envelope looping) keys twice. The screen will change to:

r-0

Use the patch value keys to switch between r-1 (envelope retriggers) or r-0 (envelope does not retrigger). The settings can be stored in the patch. The default value is always to not retrigger.

## Greeting Message

BSII can now support a custom message display at startup. This can be easily configured in Components, or sent to the unit over sysex using the message:

```
F0 00 20 29 (novation preamble)
```

```
00 33 (bass station II –specific)
```

```
00 (message protocol version)
```

```
47 (message type = greeting message)
```

```
01 (splash screen enabled or disabled)
```

```
[numbers corresponding to ascii characters]
```

```
F7
```

For example, to change the message to “turn it up”, send:

```
F0 00 20 29 00 33 00 47 01 74 75 72 6e 20 49 74 20 75 50 F7
```

To disable the greeting message send the same message without the characters, and with the enable section changed to 0:

```
F0 00 20 29 00 33 00 47 00 F7.
```

The message will forever appear on start up until you either disable it, change it, or downgrade your firmware.

## Character Support

There are some limitations to displaying letters on a 7-segment display. Some of them appear unusual, though all of the standard ascii letters are mapped to something that's supposed to look a bit similar. Sometimes the letters might come out capitalised, or de-capitalised.

We can support the characters [0:9][a:z][A:Z], space (0x23) and the hyphen (0x20).

## Oscillator Error

To create a bit more carnage it's now possible to introduce random detune on each note-on event. To set this up hold the function key and press Oscillator-Pitch Bend Range twice. The screen will change to:

E-0

Use the patch value keys to change this value from 0:7 where 0 is no error, and 7 represents an error of maximum approximately 1 semitone. The error follows a pseudo-random function, so it should be different every time you press.

The oscillator error can be saved in the patch. By default it will be 0 (no error).

When in paraphonic mode the error will be different for each part.

## MIDI Implementation

All of these new features can be controlled by MIDI using NRPNs.

MIDI NRPNs (MSB:LSB)

**Paraphonic Mode** 0:107

**Filter Tracking** 0:108

**Amp Env Retrigger** 0:109

**Mod Env Retrigger** 0:110

**Osc Tuning Error** 0:111