TubeOhm Jeannie Firmware V 3.01.xxx
What is new?

Extended manual 1.01 / 29.02.24

https://www.tubeohm.com/jeannie-main.html

Here is an overview of what has changed in firmware 3.

- Jeannie now has a vowel oscillator, several different wavetable oscillators and various shruthi oscillators.

- Furthermore, there is now a **patch volume**.

- A **mono mode** with assignable number of voices has been implemented.

- The **modulation matrix** has been expanded to include modulation entries for the new oscillator functions

- there is now a **random panorama function.**

What is a Vowel Oscillator? Wavebank P, Wave 1

- A vowel oscillator is an important component of speech synthesis and is used to generate vowel or vowel-like sounds.
The vowels a, e, i, o and u (Parameter_A) and the formant (Parameter_B) can be changed dynamically using 2 parameters.
- Both parameters can also be modulated by LFO 2 (mono), LFO 3 (mono) and the ADSR 1 (poly) can also be modulated. The setting is made in the modulation matrix.

What is a wavetable oscillator? Bank P, Wave 18,19, 20, 21

- In contrast to a normal oscillator which can only play one waveform, a wavetable oscillator, as the name suggests, has a table with different waveforms. These can be selected and cycled through. It is also possible to interpolate between the individual waveforms to create a smooth transition.

- **Example:** In a table, there are 10 waveforms in a row. The first wave is a sine wave, the tenth wave is a sawtooth. The remaining waves are something in between. The oscillator should cycle through the individual waves from sine to sawtooth in five seconds.
Without interpolation, it will click every time the oscillator moves to the next wave.
With interpolation, intermediate values are calculated and the waveforms can be travelled through from sine to sawtooth without background noise.
The result is a sound as if a filter is slowly letting the high frequencies through - only without a filter.

- Depending on the complexity of the wave table, dramatic changes in the sound are possible which cannot be realised with a filter alone.

- Jeannie has 4 different wavetable oscillators with different waveforms and modulation options.

What is a Shruthi oscillator? Bank P, Wave 2, 3, 4, 5, 6, 7

- **Shruthi** is an 8-bit DIY synthesiser with digital sound generation but analogue filters. It is still sold today as a kit by TubeOhm.

- We have tried to capture the 8-bit charm in these oscillator models.

- These oscillators have only one dynamically controllable parameter.

- The 8-bit resolution makes the oscillators sound a little dirtier, with some digital artefacts.

**** The Braids oscillators sound cleaner because they have a 16 bit resolution.

What is the PATCH volume? VCA submenu AMP

In the Jeannie we have four types of volume control.
Oscillator volume, oscillator MIX, patch volume and analogue volume

- **Oscillator Mix** controls the volume ratio of OSC 1 to OSC 2.
   *** Oscillator menu 1 and 2

- **Oscillator volume** controls the volume of both oscillators after the mix.
  Here's what you get: Behind the filter are our soft distortion curves. The sound changes depending on the volume of the oscillators and the resonance of the filter. If the volume is too high, the soft distortion goes into saturation.
  *** Oscillator menu 1 and 2

- This can result in a great sound but also a very high volume, which is already close to digital distortion. Accordingly, the FX module can also overdrive! If the **oscillator volume** is reduced, the sound becomes quieter, but it also changes. The operating point in the soft distortion curve has been shifted by reducing the oscillator volume.

- Now the **patch volume** comes into play. This changes the volume behind the VCA without changing the operating point in the soft distortion curve.
  ***VCA submenu AMP

- The **analogue volume** is controlled by the volume potentiometer at the top right

What does the mono mode do and how do I set it?

- A **mono mode** has also been added. This allows Jeannie to be played in monophonic mode.
- **Mono mode** also allows up to **6 voices** to be assigned to one key and **detuned**. Jeannie is then still monophonic, but can have up to 12 oscillators on one voice.
- The **mono mode** setting is located on the system page and **can only be set** when the **Unison button is pressed.**
- Now you can choose between mono 1 to mono 6 and a chord mode.
- the voices can be **detuned against each other** with DETUNE in the Oscillator 2 menu. *** may be changed again in the following firmware versions.

What is a random panorama function?

- **Random panorama** creates a randomised position of the voices in the stereo field. With smaller values, all voices are close to the centre position; with larger values, one voice can be heard on the far left and on the far right when the key is pressed again. When playing polyphonically, all voices are distributed in the stereo field; when playing monophonically, one voice jumps randomly from left to right.

- The random panorama function can be found in the VCA subpage under PAN.

Wavebank P ,Wave 1, the Vovel Oscillator
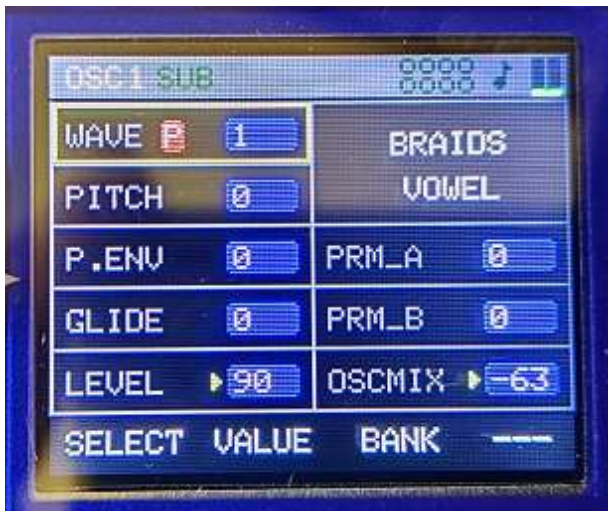
If Bank P is selected, the new oscillator models can be edited.
The new parameters on the right are **PRM_A** and **PRM_B**

PRM_A sets the vowels a, e, i, o, u.

PRM_B sets the formants and the fundamental frequency of the voice.

Wavebank P, Wave 3, Shruthi ZSAW

The new parameter on the right-hand side is **PRM_A**. This regulates from a sine wave to a sawtooth.

The sound has 8-bit resolution and is grainier.

Wavebank P, Wave 3, Shruthi ZSYNC

The new parameter on the right-hand side is **PRM_A**

PRM_A is used to emulate oscillator synchronisation.

It sounds as if one oscillator is synchronising a second oscillator.

Wavebank P, Wave 4, Shruthi ZTRI

The new parameter on the right-hand side is **PRM_A.**

PRM_A modulates a sine wave on the triangular signal.

Wavebank P, Wave 5, Shruthi ZRESO

The new parameter on the right-hand side is **PRM_A.**

PRM_A modulates a sine wave to the signal so that it sounds like a resonant oscillation of a filter

Wavebank P, Wave 6, Shruthi ZPULSE

The new parameter on the right-hand side is **PRM_A**.

PRM_A modulates a sine wave on the square wave signal so that it sounds like a resonant oscillation of a filter

Wavebank P, Wave 7, Shruthi CHRUS_SINE

The new parameter on the right-hand side is **PRM_A**.

PRM_A modulates a sine wave on the signal. This does not change the frequency. Suitable for atonal sounds.
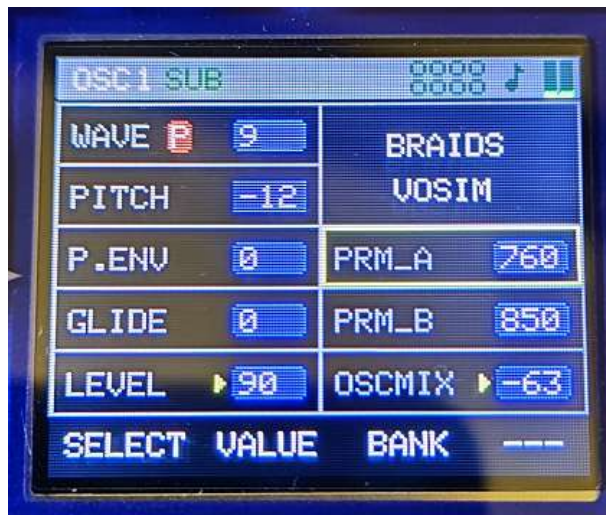
Wavebank P, Wave 8, BRAIDS CSAW

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

PRM_A and **PRM_B** add more harmonics to the sawtooth oscillation.
If **PRM_B** has the **value 999** and **PRM_A** is controlled or modulated, phasing-like sounds are created.

Wavebank P, Wave 9, BRAIDS VOSIM

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

PRM_A and **PRM_B** generate voice-like waveforms, which can be strongly modified via both parameters.

Wavebank P, Wave 10, BRAIDS TOY

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

TOY is an experimental waveform.
To play tonally, **PRM_A** must be set to **999**.

If both parameters are modulated, the result is ring modulation-like or digital sounds.

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Wavebank P, Wave 11, BRAIDS SAWSWARM

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

SAWSWARM is a type of **superwave**.
PRM_A sets the detuning of the individual waveforms.
PRM_B is a high-pass filter and can thin out the bass if required.

Wavebank P, Wave 12, BRAIDS ZLPF

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

ZLPF emulates a low-pass filter and waveform.
PRM_A emulates cutoff.
PRM_B emulates various waveforms.

Wavebank P, Wave 13, BRAIDS ZPKF

The new parameters on the right-hand side are **PRM_A** and **PRM_B.**

Works similar to ZLPF
However, the waveforms have more bite.

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Wavebank P, Wave 14, BRAIDS ZBPF

New parameters on the right-hand side are **PRM_A** and **PRM_B**

This oscillator simulates an OSC with bandpass filter.

PRM_A = Cutoff
PRM_B = Resonance

Wavebank P, Wave 15, BRAIDS ZHPF

The new parameters on the right-hand side are **PRM_A** and **PRM_B.**

This oscillator simulates an OSC with a high-pass filter.

PRM_A = Cutoff
PRM_B = Resonance

Wavebank P, Wave 16, BRAIDS RING

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

This oscillator simulates an OSC with a high-pass filter.

PRM_A = Cutoff
PRM_B = Resonance

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Wavebank P, Wave 17, BRAIDS FM

The new parameters on the right-hand side are **PRM_A** and **PRM_B**.

FM consists of 2 oscillators, a carrier and a modulator.

PRM_A determines the modulation depth of the modulation oscillator.
PRM_B determines the frequency of the modulation oscillator.

Now we come to the highlights: the Wavetalbe oscillators

Wavebank P, Wavetable 18, BRAIDS WTBL

New parameters on the right-hand side are **POS** and **WTBL**.

WTBL consists of a two-dimensional array.
With **WTBL**, 20 different basic waveforms can be selected.

These basic waveforms in turn contain wavetables, which are scrolled through with the **POS** control.

Basic waveforms are :

male, female, choir, space-voice, tampura, shamus, swept-string, bowed, chello, vibes, slap, piano, organ, waves, digital, drone1, dron2, metallic, fantasy, bell,

The Pos control can be used to cycle through various male, female or other desired waveforms.

Wavebank P, Wavetable 19, BRAIDS WMAP

The new parameters on the right-hand side are **X-POS** and **Y-POS.**

WMAP is a 16x16 wave wavetable array.

X-POS selects the waves in the X direction.
Y-POS selects the waves in the Y direction.

Wavebank P, Wavetable 20, BRAIDS WLIN

New parameters on the right-hand side are **POS** and **SMOOTH**.
WLIN is a linear wavetable. Via **POS** is used to select the waveform. **SMOOTH** smoothes the transitions between the individual waveforms.

If **SMOOTH**=0, you can clearly hear how individual waveforms switch.
SMOOTH=999 interpolates between the different waveforms and we get smooth transitions.

Wavebank P , Wavetable 21 BRAIDS WTX4

Here is perhaps the most beautiful wavetable.
The new parameters on the right-hand side are **POS** and **CHORD**.
POS selects a waveform.

CHORD has two different functions
The selected waveform is detuned slightly from 0...94. It sounds as if 2 oscillators are detuned against each other. The value 94 is used to set polophonic chords.

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Up to this point in the manual, the static settings of the new oscillators have been described.

'Static' means simply adjusting the pots to generate a waveform from the wavetables or shruthi oscillators.

And now movement comes into play.
Of course, you can also dynamically control the new parameters using **LFO 2, LFO 3** and the **ADSR 1** filter envelope.

While an LP filter basically only lowers the treble of the signal, a wavetable oscillator, for example, can be driven from one wave to another with a totally different spectrum.

In the Jeannie, for example, **LFO 2, LFO 3** and the filter **ADSR 1** can take over this control.

An example: The wavetable oscillator **21 Braids WTX4 (OSZ 1)** is to be run through completely with all waves. **LFO 2** with an ascending sawtooth is used as the modulator. The **PHS** phase of **LFO 2** is **set to 0** for this purpose. Each time the button is pressed, the monophonic **LFO 2** starts again with phase=0.

In the **modulation matrix**, we set position **25 " LFO2 " value 127 " Osz1 PRM_A**

This means that **LFO 2** should control parameter A of oscillator 1 with the maximum modulation depth of 127.

The following settings must be made:

OSZ-1-Menü

Wave P 21 , Braids WTX4
Pitch   =   -12
P.ENV =   0
Glide   =   0
Level   =   90

POS   =   0
CHORD =   0
OSZMIX=   -63

LFO-2-Menü

SHAPE=   3
RATE =   8
AMT   =   0
PHS =   0

MODULATIONS-MATRIX

Position 25 » LFO2 » Wert 127 » Osz1 PRM_A

What happens with these settings?

A button is played. LFO2 starts with an ascending sawtooth wave.
The sawtooth modulates OSZ1P, WTX4 modulates the POS (position) parameter.
The entire wave bank is run through at the speed of LFO 2.
It's almost as if you were turning the potentiometer for the wave position - only automated by LFO 2.

Limitations of this method:

LFO 2 and the other LFOs on the Jeannie are monophonic. This means that there are only three monophonic LFOs for the eight voices. If you now play a second key, the LFO resets and the wavetable oscillator starts running through the waveforms again from the beginning with both voices. Of course, it is only a monophonic LFO, which is also retriggered each time a key is pressed.
This can be remedied by setting the phase of the LFO to "OFF". But then the starting point of the wavetable is no longer defined because the LFO is somewhere and continues to run.

But of course, we also have the polyphonic VCF ADSR 1 envelope!
With this, it is possible to have a defined starting point for the wavetable and to cycle through the entire wavetable with a slow attack.

To do this, go to position 25 in the MOD matrix and set the value for LFO 2 to 0.
LFO 2 as the modulator of the wavetable is switched off.

Now we go to position 33 in the modulation matrix and set the value to 127.

33 ENV1 127 OSZ1 PRM_A

The ADSR 1 (VCF) now modulates parameter A of oscillator 1 P21, XTX4 with a modulation depth of 127.

In ADSR1 (VCF) the ATTACK time is changed to 127.

Now the wavetable should slowly pass from the set POS=0 in the oscillator menu through the slow attack of the ADSR 1 (VCF).

At the same time, LFO 2 or LFO 3 can also affect parameter A or parameter B or both parameters.

Now a few words about the "POS" position in the OSCILLATOR menu.
This is a kind of offset and shifts the start position.

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A short repetition:

LFO 1 and LFO 2 as well as ADSR 1 (VCF) can modulate Parameter_A and Parameter_B of the new oscillators P1 to P21 simultaneously. All other functions, e.g. soft distortion, ring, And, X-OR, filter, etc. work as before, of course.

Any oscillator models can also be loaded and modulated in OSC 1 and OSC 2 menue. A real playground for new sounds.

Here are the new functions of the modulation matrix.

SLOT	SOURCE	AMOUNT	DESTINATION
25	LFO 2	0..127	OSZ1 PRM_A
26	LFO 2	0..127	OSZ1 PRM_B
27	LFO 2	0..127	OSZ2 PRM_A
28	LFO 2	0..127	OSZ2 PRM_B
29	LFO 3	0..127	OSZ1 PRM_A
30	LFO 3	0..127	OSZ1 PRM_B
31	LFO 3	0..127	OSZ2 PRM_A
32	LFO 3	0..127	OSZ2 PRM_B
33	ENV 1	0..127	OSZ1 PRM_A
34	ENV 1	0..127	OSZ1 PRM_B
35	ENV 1	0..127	OSZ2 PRM_A
36	ENV 1	0..127	OSZ2 PRM_B

It is read like this:

Slot 25:

LFO2 modulates with the modulation depth AMT‚0..127' the Parameter A from *Oszillator 1*

Slot 32:

LFO3 modulates with the modulation depth AMT‚0..127' the Parameter B from *Oszillator 2*

Slot 36:

ENV 1 modulates with the modulation depth AMT‚0..127' the Parameter B from *Oszillator 2*

Here are a few tips and tricks.

Extremely important! Case 1: When you programme a sound, make sure that no unwanted distortions are created by excessive volume.
The procedure is as follows:
Create a sound and play it with eight voices. If distortion occurs or the distortion LED lights up, first reduce the patch volume until the sound has no audible distortion. The distortion LED should not light up or flicker.
This serves to prevent the FX from being overdriven. Alternatively, it is also possible that the sound is too quiet. Of course, the patch volume should then be raised slightly.
Also pay attention to the oscilloscope. Are the waveforms clipping? If so, turn down the oscillator volume.
It is important for a clean sound that no distortion occurs when 8 voices are played simultaneously. Neither in the signal nor in the FX.

Second case: distortion is cool, let's have it.
Yes, we have built in the soft distortion curves for this, but these distortions should not hit the FX module. So if the distortion LED lights up bright red, then it's time to adjust the patch volume so that the FX module is not overdriven, regardless of what happens before it.

Here is the explanation: The FX module is a separate module with an FX chip and analogue inputs. It doesn't matter what signals go into the inputs of the FX module, the FX module should not be overdriven in terms of voltage. The distortion LED indicates whether the input level is in the green range. If the FX module is overdriven, the distortion LED lights up.
The distortion LED is therefore only an indicator for the FX module, not for the entire signal that Jeannie produces.

Clicks in the sound with a new note ?

Osc 1 and 2 have a switchable sync function in the Osc sub menu.
This resets the phase of the osc waveform to 0 each time a key is pressed and is used to achieve a defined attack for percussion sounds.

However, with a long release of the VCA ADSR and simultaneous playing of many keys, the oscillators are repeatedly set to phase 0. We get phase jumps that are perceptible as attack clicks.
If oscillator synchronisation is set to OFF, the oscillators simply continue to run and the clicks are eliminated.
Please note that the Jeannie's envelopes are also very fast: 0.5 ms. It is therefore sufficient to set the attack time to 1..3 for fast attack times. For a very fast punch, you can also use the 0 setting.

Have fun with the new firmware 3.xx.xxx

Rolf
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