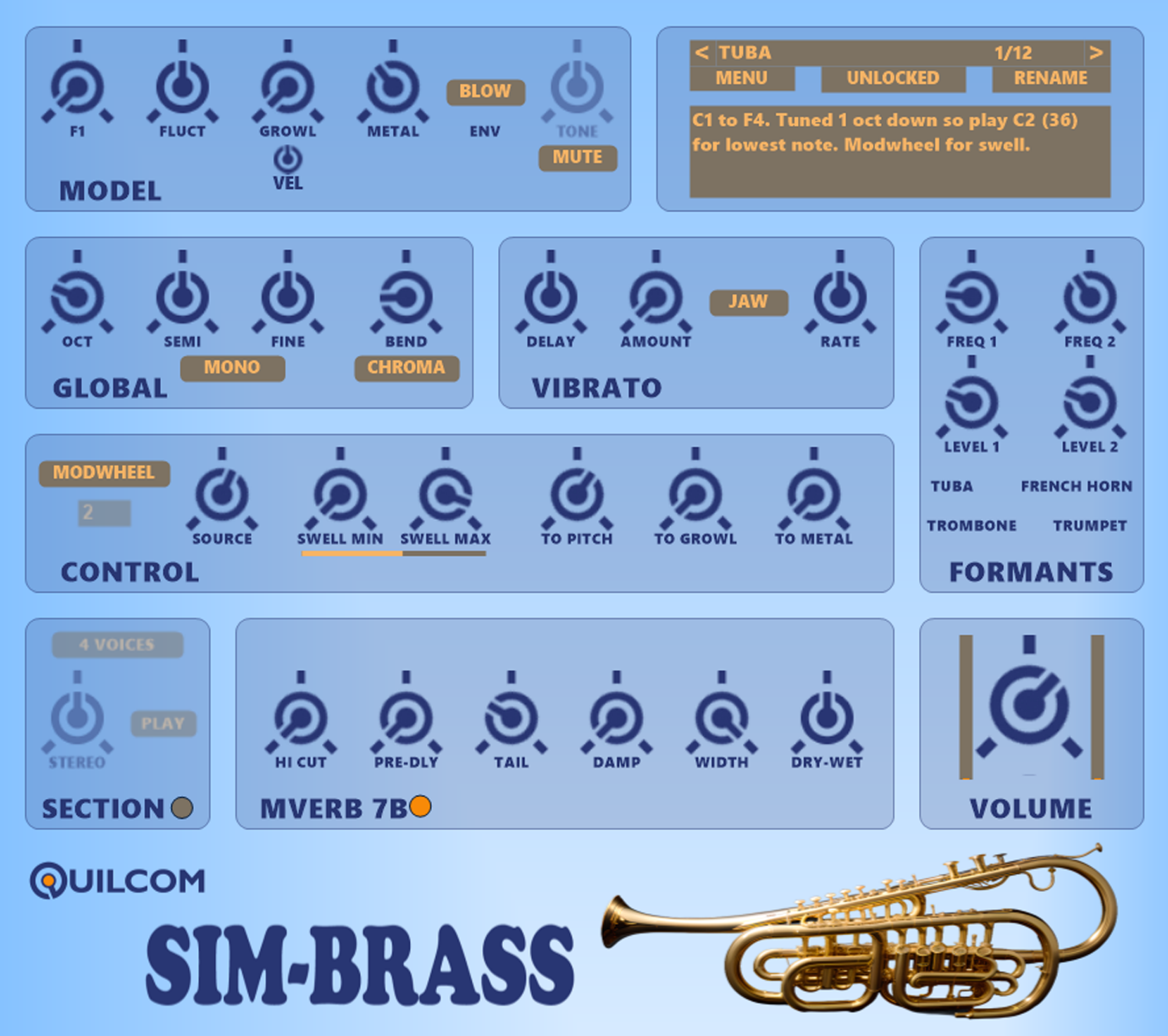
**Quilcom SIM-BRASS**



**Design**

Someone suggested I make a generic brass synth, along the lines of my Quilcom SIM-REED for reed instruments. Not only is the sound difficult to synthesise, but also skilled players, especially jazz musicians, can create a huge range of expressive sounds. So, the SIM-BRASS is my attempt at creating more limited expression possibilities, with as authentic a sound as my capabilities allow. Sample libraries give more authentic sounds, but with less control over the timbre.

Rather surprisingly, the term “brass” doesn’t refer to the metal used, but rather the excitation method, which is lip vibration or “lip reed”. You can get wooden “brass” instruments which may be harmonic or chromatic. There’s more info in the *Background info* folder.

**In use**

I’ve supplied a few basic presets which are intended only as starting points.

To keep things simple, there’s only one control source for expression, but the effect of this source, e.g. modwheel, can be directed to 4 different targets. Velocity *doesn’t* affect volume but can affect attack time and initial growl.

Brass instruments typically have a range of about 3 octaves (indicated in the presets). Outside of this range notes can still be played on the plugin, but will sound less convincing.

**MODEL**



This panel interacts with the DSP used for the sound generator.

**F1** sets the level of the fundamental frequency. Instruments with a larger bore may generate a higher fundamental level.

**FLUCT** adjusts the amount of random fluctuation of several parameters which is often heard on more sustained notes due to pressure variations of the performer’s breath and turbulence effects.

**GROWL** adjusts the level of the sound sometimes heard when a loud note is first played. The small **VEL** knob sets the velocity threshold above which the growl will be heard at the start of the note. So, by hitting a note harder you can create that initial sound. Note that velocity does NOT affect volume. As you *increase* the **VEL** adjustment, the growl will start at lower velocities.

**METAL** adjusts the more metallic components of the instrument. When set to minimum, the sounds tend towards being more wooden than metallic.

**ENV**: The main envelope has 2 options: **BLOW** and **TONGUE**.

**BLOW** gives a slower attack and is affected by velocity, such that lower velocities will give a slower attack. **TONGUE** simulates when a player creates a plosive impulse at the start, which gives a faster attack (useful for rapid playing and more accurate timing). Velocity is still used but only makes a small difference across the whole velocity range.

When **MUTE** is turned ON, the **TONE** knob becomes active. This allows for static adjustment of a mute’s effect and can also be automated to create the classic Brass wah-wah sound.

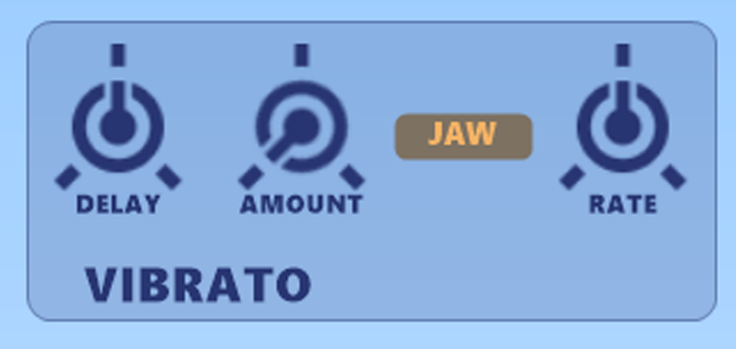
**GLOBAL**



On this panel you can use the **OCT**, **SEMI** and **FINE** knobs to tune the whole plugin. Some MIDI files will probably be tuned correctly for an instrument. If not, you can use the **OCT** knob, or transpose the track in your DAW. **MONO** is one note at a time. This can be switched to **POLY**, for chords and overlapping/legato notes in a MIDI file track. **MONO** mode is useful for making rapid trills between 2 notes by holding a note and rapidly playing an additional one. The pitch will then jump between the 2 notes.

**BEND** sets the range of the pitch bend wheel in semitones. **CHROMA** means the steps will be in chromatic semitone intervals. This can be switched to **SMOOTH**.

**VIBRATO**



Vibrato, in a *musical* sense, can modulate pitch *and* amplitude. The **DELAY** knob adjusts the time between playing a note and vibrato starting. The **AMOUNT** knob adjusts the depth of modulation that comes in after the **DELAY** time. For automation, you can set the **DELAY** to zero and operate the **AMOUNT** knob to suit. The **RATE** knob adjusts the speed over a useful range.

A brass player will typically use their **JAW** to modulate the air flow. In this case the pitch will drop then return to normal, not going high. Since the air flow is varied, the amplitude will also change during this type of vibrato. Trombone players can also do this, but they have the luxury of using the **SLIDE** for pitch modulation only (not amplitude). When **SLIDE** is selected the modulation is bipolar and the amplitude is not modulated.

**FORMANTS**



I was surprised to learn that brass instruments actually have formants (static peaks in their spectrum). It’s not just acoustic instrument’s soundboxes! Typically, they have 1 formant each but trumpets have two. So, this panel provides two different frequency (**FREQ**) adjustments, each with their own **LEVEL** setting. These settings can make a big difference to the timbre, but please be aware that the pitch range you play will interact with these formants within fairly narrow ranges. That means you should match the formants for the pitch range of instrument you wish to simulate.

To simplify things, the *labels* **TUBA** etc can be clicked to preset the frequencies to match instrument type. These are provided as starting points for you. If you are layering several instances of the plugin, setting the formants slightly offset for each instant can create a more convincing ensemble sound with better separation.

**CONTROL**



The single expression control signal source can be chosen with the selector showing **MODWHEEL**. This has the following sources available:

**MODWHEEL**

**BREATH**

**FOOT PEDAL**

**VOLUME**

**EXPRESSION**

**RIBBON**

**SUSTAIN**

**FREE**

If you select **FREE** the edit box will become available and you can enter your preferred CC number.

Whatever source you choose, the **SOURCE** knob will respond. Alternatively, you can just operate and automate this knob. Whichever you use, the last one touched (knob or wheel etc) will take over the value.

There are 4 possible targets for the control value.

**SWELL** is a macro that affects volume *and* timbre. **SWELL MIN** adjusts the minimum control effect and **SWELL MAX** adjusts the upper limit. To adjust these, I recommend setting the modwheel etc to minimum then adjust the minimum swell you want. Then set the modwheel etc to maximum and adjust the maximum swell you want. The full range may be unsuitable for some sounds and be trickier to control.

**TO PITCH** adjusts the maximum pitch deviation created from the control signal. Only the best players can maintain accurate pitch over a wide dynamic range. This knob adjusts the pitch increase or decrease at higher control values. This parameter is not affected by the **SWELL** knob settings.

**TO GROWL** can be used to increase the growl sound at higher control values, assuming the **GROWL** knob on the **MODEL** panel is not set high.

**TO METAL** can be used to increase the metallic sound at higher control values, assuming the **METAL** knob on the **MODEL** panel is not set high.

**SECTION**



The **SECTION** is a multi-voice chorus based on the DSP in my Quilcom Vocoral 2. This chorus effect is quite complex and uses multiple micro pitch-shifters and randomised mixing of multiple static delays, thus avoiding the pitch “wobble” of more conventional chorus effects. Inter-voice flanging is also reduced considerably. I’ve provided an on-off LED switch because the DSP is quite heavy on CPU. To turn the *effect* on and off (click-free) use the **PLAY** button, once the DSP module itself has been turned ON.

The selector at the top has 4 options for the number of voices: **4, 8, 12 and 16 VOICES.**

The **STEREO** knob sets the width of the chorus voices generated. At zero the sound is mono, half way is stereo and increasing it further goes to a widened stereo field.

**MVERB 7B**



Once again, I used Martin Vicanek’s reverb because I really like the sound and behaviour. To turn it off, and use your own favourite, use the orange LED-switch. If layering with multiple instances and panning them, it’s best to turn off all these reverbs and just put a reverb on the master channel.

**PRE-DLY** provides a short delay before the reverb DSP. This can create the impression of being closer to the instrument in a reverberant space.

**TAIL** sets the length of the reverb tail.

**DAMP** reduces the higher frequencies as the tail decays, to simulate a more absorbent space.

**WIDTH** is the stereo width of the reverb tail only.

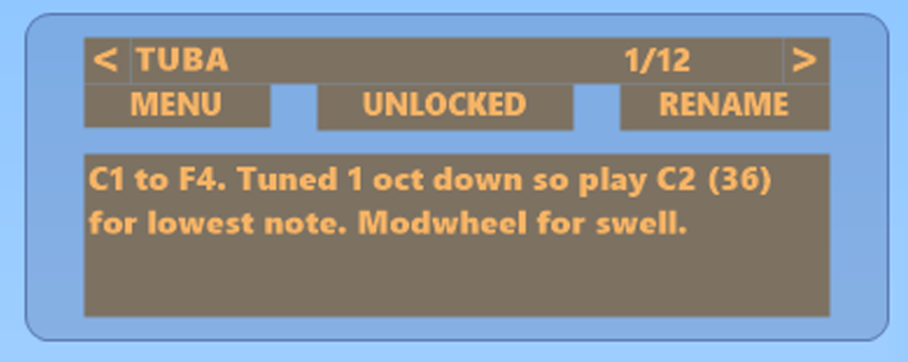
**DRY-WET** is the mix between the original sound and the reverb sound.

**Output volume**



The output **VOLUME** knob features a stereo bar meter which indicates the average peak signal level. The centre circle turns red for 1 second if the peak goes out of -1 to1 range even briefly. If you need accuracy or a different indication, please use the DAW’s meter.

**Preset Manager**



The presets I’ve provided are intended as starting points only.

At the top of the preset manager is the section where you select the preset by clicking on the preset name or paging though them using the arrow buttons. The synth is silenced and reset when a preset is changed.

The **MENU** selector is where you operate on presets and banks. You can save, load, copy or paste presets, or save and load a bank from this menu.

All changes made to any settings will be stored with the DAW song file unless the switch **UNLOCKED** is changed to **LOCKED**. This locking feature is to avoid losing settings if you just want to mess with editing but want to keep the original default parameters.

The **RENAME** button allows you to name or rename a preset, providing the preset manager is **UNLOCKED**. Otherwise, the **RENAME** button is dimmed.

At the bottom is a free text area for adding comments to the preset. These comments are saved with the song, and the preset if you save it, providing the preset manager is **UNLOCKED**. Please be aware that you shouldn’t use a carriage return (Enter) in this text because the system won’t store any text after that. Also please be aware that when you **RENAME** a preset this text will clear, so if you want to keep it and just rename the preset, highlight the text, copy it then paste back in after you’ve renamed.