

“buz fox” fuzz guitar pedal by Michael Duane

Fuzz can be an obsession with guitar players and recently catching up with an old school friend was the latest episode of my journey into sound.

Invented around 1962 and transforming the pop world since The Rolling Stones’ “Satisfaction” in 1965, fuzz is still going strong. My friend, Michael, is entirely obsessed and during our conversation he revealed that he had become a guitar pedal builder and offered to make me a custom pedal.

There is a huge range of variation on a theme when it comes to fuzz pedals. The original circuits have spawned many offspring. The Fuzz Face was the most popular pedal in the mid-late 1960’s, followed by the Tonebender and the Big Muff.



Michael told me about an expanded Fuzz Face type pedal he made for Wata, the guitarist in legendary Japanese band “Boris”. This seemed like an ideal choice and I quickly agreed.

The talk turned to octave fuzz, another hugely popular creation made immortal by Jimi Hendrix on “Purple Haze” in 1967. The Octavia effect modifies the guitar signal with a note overtone an octave higher than the original.



Michael suggested a circuit based on a Green Ringer pedal made in 1969. It operates like a ring-modulator, the device used to create the voices of the Daleks in Doctor Who, by combining and subtracting frequencies in an audio signal to create new musical or discordant frequencies.

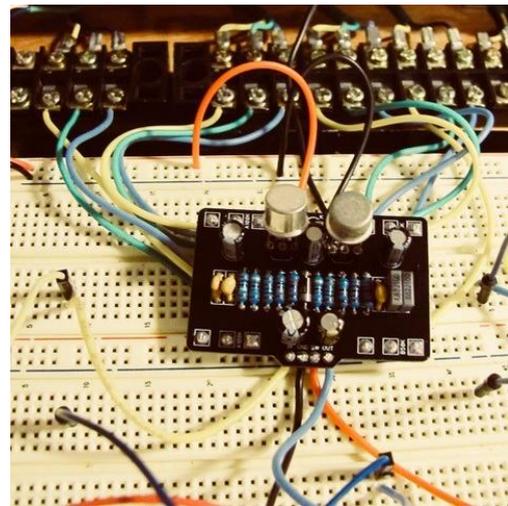
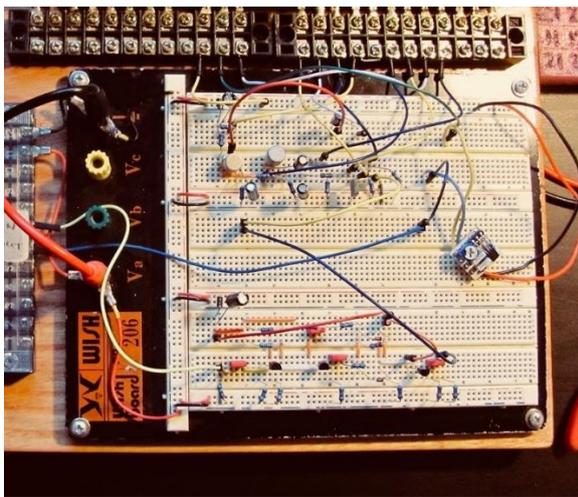
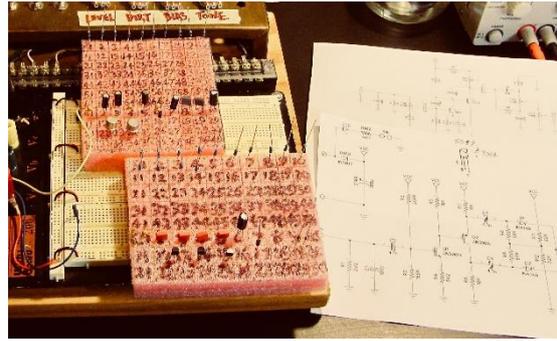


We decided that the two circuits could be combined into a double pedal and my new fuzz box was conceived.

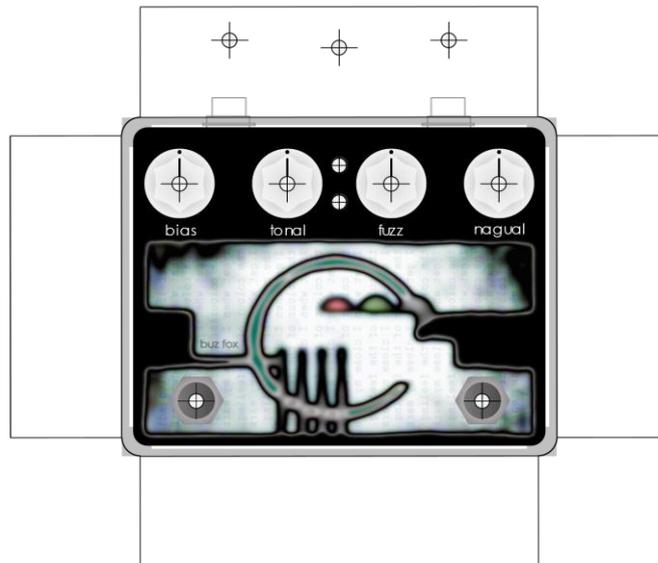
The next step in the process is to consult a circuit schematic and gather the parts needed. Once the components have been chosen, Michael moves onto breadboarding. A breadboard is an electronic board used to prototype circuits.

A variety of components, both NOS (New Old Stock) and current production, were used for my pedal. This fuzz circuit is based around a pair of carefully tested and matched 2N1711 silicon transistors from the 1970's. A pair of precisely matched Russian Д9Б (D9B) germanium diodes in conjunction with a trio of silicon transistors (2 x 2N5089 and 1x 2N3906) were used for the Green Ringer circuit.

The original fuzz circuits used germanium transistors. They are temperature sensitive and can operate erratically, so manufacturers switched to silicon transistors by the end of the 1960's. There is a difference in sound, but a good design can reproduce the sound of the vintage circuits.



While Michael was busy with the circuitry, I set to work designing the graphic for the top of the enclosure. I used an example of my art to make it truly personal. Michael sent me a drill template, so it was easy to fit my design to the physical layout of the pedal.

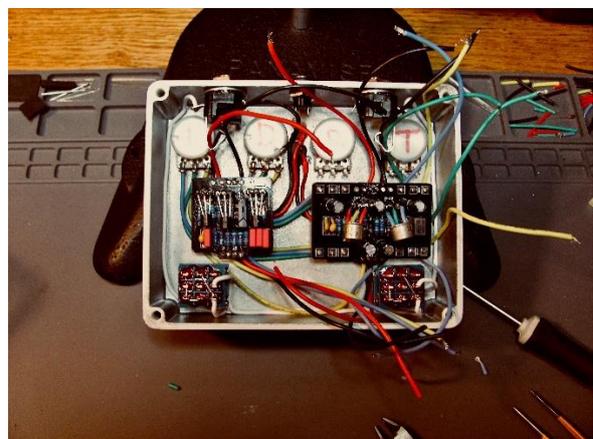
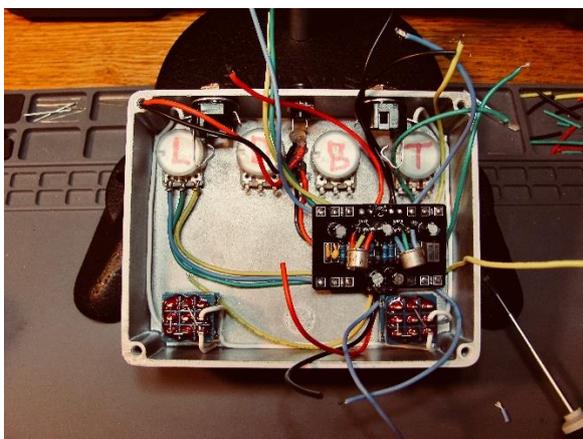


Effects pedal manufacturing is a complicated process needing many different skills. Firstly, there are the electronics; circuit design, component selection and testing, breadboarding, propagating the circuit board, soldering, and wiring.

Then the enclosure needs to be drilled and painted, the design is applied, and several coats of lacquer are applied. Once it has dried, the parts can be assembled.



Jack sockets, potentiometers, LEDs and footswitches are all connected together. Best practice dictates that you test at each stage and Michael kept me updated through each step.





Once the pedal was finished, Michael tested it one last time and put it in the post. The parcel arrived safely after a journey across the globe from Seattle to Aberystwyth in only 11 days.



What's it like?

The construction of the pedal is first class. Extra attention has been paid to the layout in the enclosure, to avoid interference with the power wires and the audio signal wires. The layout is very tidy, and the soldering is exemplary. Overall, it is a superbly built pedal constructed in the traditional manner.

The octave circuit has no controls, but the Fuzz Face has the normal output level and fuzz level controls, along with the addition of extra tone and bias controls. The Baxandall style tone control adjusts the bass & treble in the signal. The bias control enables you to starve the transistors of current to give some extremely broken sounds at its minimum setting. Either effect can be selected individually, or both can be used together.

I found the octave circuit to be a lot of fun, it delivers some authentic old school tones and can easily be used to create sonic mayhem. I found it easy to get sitar-like textures and ring-modulator style frequency doubling. It can be brash and discordant or used to slightly thicken your tone by backing off your guitar volume control.

Switching to the fuzz on its own reveals a very classic sound, which is further adjustable using the extra controls to go from silky smooth with a slight amount of distortion colour to over-the-top destruction. It can be synth-like & gated when the voltage is starved using the bias control and full of sustain when the voltage is increased.

Using both effects at the same time yields a multitude of sounds from subtle textures to full-blown noise. The octave effect can add an edgy clarity to the fuzz with some settings. I had a lot of fun investigating the huge range of sounds this pedal is capable of, from Jimi Hendrix to Robert Fripp (think "Heroes" by David Bowie), from the Rolling Stones to the White Stripes & the Black Keys, you can find it all in there.

The unit runs on an external 9v DC power supply with centre negative polarity and the current draw is only 3mA. It uses the standard Hammond 1590BB case, measuring 119.5 x 94 x 34 mm. Top mounted jacks are a standard inclusion and it works with other pedals better than the original Fuzz Face.

I'm very happy with this pedal. It's a real hand-wired gem with attention given to every detail. The process was a lot of fun and I now have a great fuzz box to explore.

Further information:

<https://www.electrosmash.com/fuzz-face>

http://www.geofex.com/article_folders/fuzzface/fftech.htm

http://www.bigmuffpage.com/The_Tonebender_Timeline.html

http://www.kitrae.net/music/big_muff_history1A.html

<https://www.roger-mayer.co.uk/octavia.htm>

<https://reverb.com/news/the-most-influential-pedal-builder-youve-never-heard-of>

<https://www.sciencebuddies.org/science-fair-projects/references/how-to-use-a-breadboard>