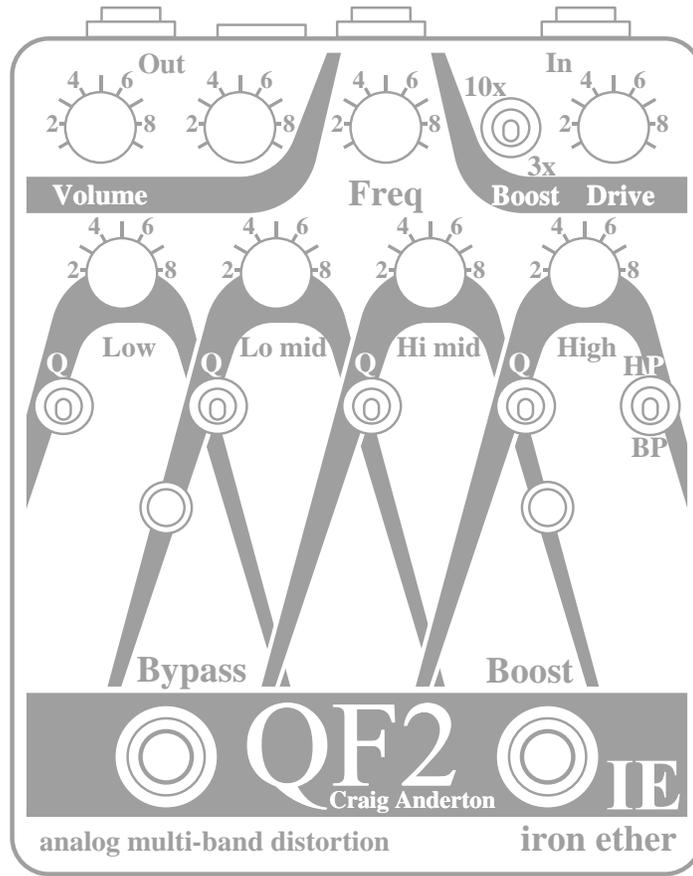


# QF2

## Analog Multiband Distortion Pedal



## Iron Ether



## INTRODUCTION:

*“Don't Miss Out on the Next Big Thing in Guitar Distortion. If you're a guitarist and you're not into multiband distortion...well, you should be. Multiband distortion delivers a "dirty" sound like no other. Not only does it give a smoother effect with guitar, it's a useful tool for drums, bass, and believe it or not, program material to add a distinctive, unique edge.”* – Craig Anderton, musician, author, and music electronics guru

Congratulations on your purchase of the QF2 Multiband Distortion Pedal, perhaps the most unique and versatile distortion pedal on the market.

The QF2 is based on the original “Quadrafuzz” rack-mount effect invented by Craig Anderton circa 1980. Unlike any other distortion pedal, it splits an instrument signal into four frequency channels and distorts each channel separately for the smoother, cleaner sustaining sound with minimum harshness.

You will discover a full palette of truly distinctive sounds. Here are a few things that it does well that you can't do with a standard overdrive-distortion-fuzz pedal:

1. It lets you to play complex chords without them turning into crap at relatively high drive levels.
2. You can get very focused voicing in a live band or studio setting by using a subset of the four filters and adjusting them to put the tone exactly where you want it in the mix.
3. You can get very cool vocal, "wah-like” sounds if you crank up the Q's and levels of the filters. But it has a lot richer and more sophisticated sound than a wah pedal.
4. It supports an expression pedal input for controlling the most interesting and unique parameter of the effect – frequency. More on this later...

## **CONTROLS DESCRIPTION:**

**Band knobs:** Separate mix level controls for each of four distorted frequency channels.

- Low band covers fundamental frequencies of lower notes on the instrument
- Low Mid and High Mid bands cover higher notes and harmonics of lower notes
- High Band covers higher harmonics

**Resonance (Q) switches:** Boosts and sharpens each frequency band, intensifying the effects of the filters.

**BP/HP switch:** Changes High frequency band from a bandpass filter to a highpass filter, to let through the brighter harmonics.

**Frequency knob:** This control allows all four channels to be shifted simultaneously over a pitch range of three octaves. This is perhaps the most important control to understand.

**Drive knob:** Controls the gain going into the effect. Highest drive levels actually distort before the filters as well as after for maximum crunch.

**Boost switches:** Boost footswitch further increases front-end drive. The gain is increased by a factor of either 3 times or 10 times, depending on the Boost toggle switch. Find a great rhythm tone, and then hit the Boost footswitch for a hotter lead sound.

**Tone knob (QF2 Gold only):** Overall tone shaping, from treble cut to mild boost. Adds or takes off the sharp upper “edge” for guitar and other instruments.

**Mix knob (QF2 Copper only):** Wet/dry mix control. Adds clean (dry) signal along with the filtered, distorted channels (wet). Highly desired by bass, keyboards, drums, etc.

**Volume knob:** Sets the output volume level. Used to match the level of the QF2 signal to the bypassed signal.

**Expression jack:** This proto unit has a jack to control the frequency knob for wah-type effects. Accepts a ¼” stereo to dual mono (“Y” or “insert effect” cable), and a standard passive volume pedal.

**Bypass switch:** True bypass using click-free relay technology.

**Power jack:** Runs on industry-standard 9 volt DC center negative power supply.

**Size:** Measures 5.7” x 4.7” (14.5cm x 12cm).

## GETTING STARTED:

With so many controls it is difficult to explore to full potential of the QF2 without understanding what each one does and how they interact. Here is the quickest and easiest way to figure out what is going on:

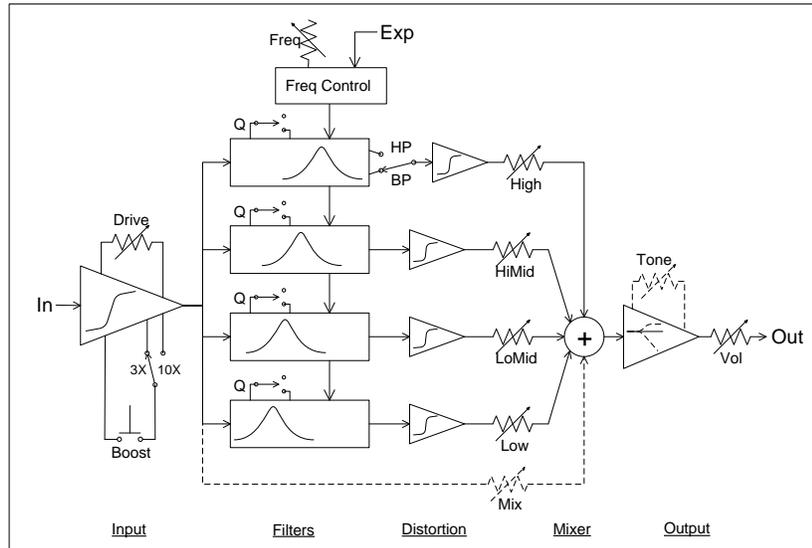
- Start with all the controls in their mid position (around 5). Verify that the Bypass and Boost footswitches toggle their respective indicator lights on and off, and that the sound goes from clean to fuzzy. Leave the left light on, and the right light off.
- Turn the four band controls on the second row all the way down (to 0). On the QF2 Copper, turn down the Mix control to zero as well. No sound should be heard.
- Now turn up each band one at a time while playing. Listen to the distinct sound of each of the distorted bands. These are the building blocks of the QF2.
- As you audition each band, try the three positions of the corresponding Q or resonance switch. Also check out the BP/HP switch on the High band. The higher Q switch setting will sharpen the effect of its corresponding filter.
- With all four bands in the mix, try some chords. Start with the Drive control low, and then try it at increasing drive levels. Nice dirt with less of the harsh intermodulation (IM) distortion, even with complex chords.
- Now the fun part. With one or two of the bands turned up, and the Q switches set all the way up, crank the Frequency knob while playing. The vocal, wah-like quality of the filter resonance can add some real power to your tonal shaping.
- These simple steps should give you some idea of the palette of sounds that are available to you. Now pick some that you like, mix them together, modify them, etc. Just start playing around.

You can see that there are practically an infinite number of control combinations. Some of them will sound fantastic. Many will be interesting, but maybe not useful to you. And many will be not so great, frankly. It may be hard to find the good ones by trial and error. The rest of this manual contains some tips that should help. Also, please check out the videos on the Iron Ether website. These are perhaps the most efficient way to get up to speed.

## HOW IT WORKS:

This more technical description should help fill in the big picture of what is going on inside the QF2. It should give additional insight into what the controls do and how they interact. Having a “mental model” for the effect will make you better at coaxing great sounds out of it.

The QF2 can be broken down into sections, from input to output. Below is a block diagram which shows each section:



The first section is a preamp. It accepts a low-level, high impedance input signal, and amplifies it according to the Drive control and the Boost switches. At higher drive settings, this stage introduces some intentional soft clipping in order to avoid nasty sounding hard clipping.

The output of the preamp drives four parallel filters. Their pass frequencies are carefully selected to cover four separate ranges of the instrument frequency spectrum. The sharpness of the filters, called the Q or resonance, is individually adjustable with three-position switches. The lower Q setting provides the broadest and smoothest filter response, which adds the least “coloring” to the sound. The highest Q setting is quite focused and narrow, creating a distinct “wah-like” vocal peak. Since each filter has its own Q control, multiple peaks can be created in the overall response.

In addition, the highest frequency filter can be switched from a band-pass to a high-pass filter characteristic. The band-pass filter covers a relatively narrow range of frequencies. The high-pass filter opens up the filter for frequencies above its resonance, resulting in a brighter sound.

The four filter’s frequencies are spaced at fixed musical intervals, but are adjustable together as group. This frequency control can vary the filters over a three-octave range. At a setting of 4 (around 11 o’clock) on the Freq knob, the lowest filter corresponds to the low E string on a guitar. Turning it down to 0 moves the filters down about one octave, which is appropriate for bass guitar. Turning it up to 6 (around 1 o’clock) moves everything up one octave, which is

great for playing higher up on guitar or keyboards. Other settings allow you to “dial in” specific sounds, especially at the higher Q settings on the filters.

The filter frequencies can also be controlled via the expression pedal jack. See the next section for discussion of this feature.

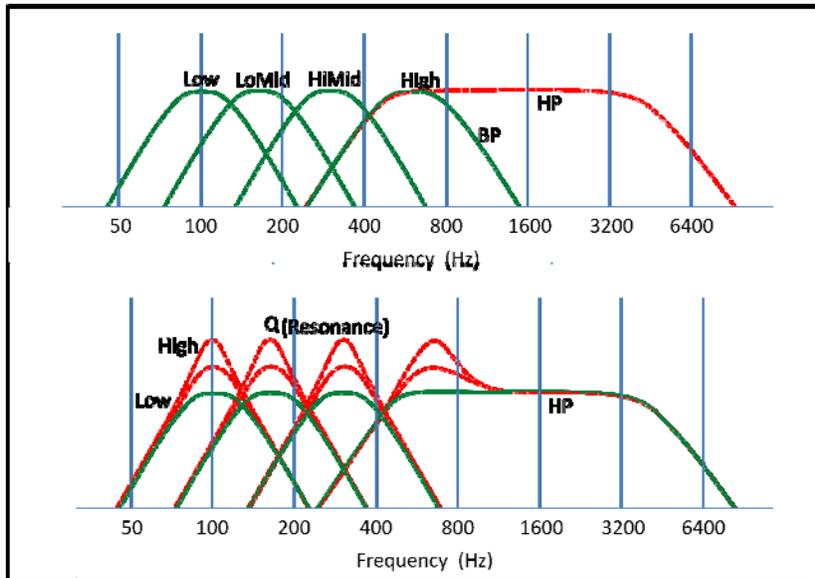
Each filter output goes to its own high-gain distortion stage. Distorting the filter bands individually is key to the distinct sound of the QF2. It reduces the interaction between notes of a chord, creating a smoother sound. [\*See “for geeks only” below for more detail.]

Each of the distorted filter bands is available to add back together using the band controls in the mixer stage. This mixing gives you unique power and flexibility to create sounds - from simple, tight, and focused, to big, broad, and complex.

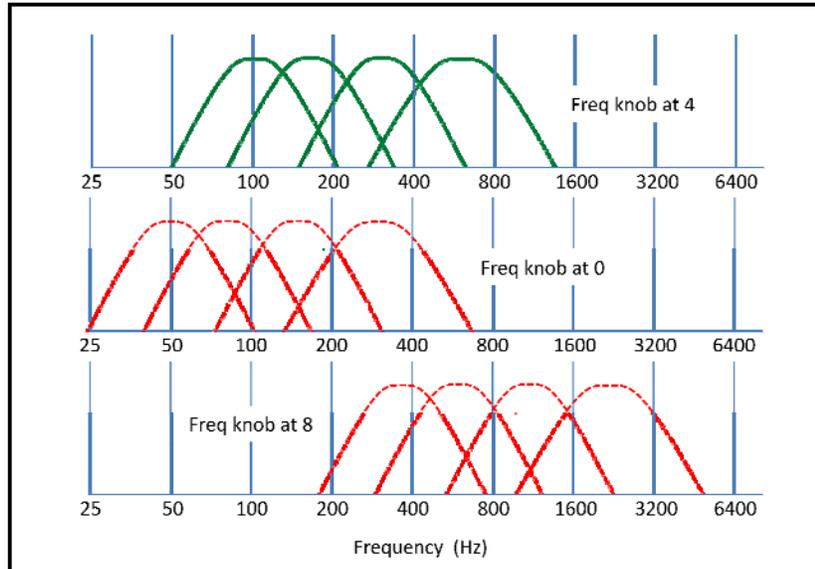
Note that the QF2 Copper version adds a fifth Mix control. It adds some of the clean signal from the preamp stage in with the four distorted band signals. This ability to mix the “wet” processed signal with the “dry” clean signal is especially useful for bass, keyboards, and drums.

The output of the mixer stage goes to the output stage. This amplifier drives the output jack through the output volume control. The QF2 Gold version adds an overall tone control to the output stage. It is actually a treble control, which ranges from a mild shelving high-pass to a high-cut filter characteristic.

The following graphs show the individual frequency bands, the effect of the BP/HP switch (top), and the effect of the individual Q or resonance switches:



The following graphs show the effect of the Frequency knob on the frequency bands:



[\*For geeks only: Technically, this interaction between notes is called “intermodulation distortion” or I.M. Any non-linear process, such as distortion, creates sum and difference frequencies of the instrument’s notes and all of their harmonics. Some of these frequencies are musically related to the notes themselves, and sound good. Some of these frequencies are not musically related (i.e. don’t have simple ratio relationships) and sound very bad. This is why musicians naturally gravitate to simple octaves and power chords (fifth intervals and octaves) when using heavy distortion. Major and minor thirds, sevenths, etc. create these unmusical intermodulation products, and can take the resulting sound from dirty to downright ugly.]

### **EXPRESSION PEDAL:**

The expression pedal jack allows the player to sweep the frequency control while playing. This is a very cool effect – much like a wah pedal, but with much greater versatility and complexity to the tones. Use the higher Q switch settings at first, in order to hear what is happening.

To use the expression pedal jack, plug a standard passive volume pedal (Ernie Ball VP Jr. is ideal) into the middle jack of QF2 using a 1/4 –inch stereo to dual mono cable, also called a “Y” cable or an “insert effect” cable. The Right side goes to the Input of the volume pedal, the Left side to the Output. If the pedal does not seem to have the proper effect, try reversing the two mono sides of the cable at the volume pedal.

When using the expression pedal, keep in mind that it interacts with the Frequency control. In essence, the knob sets the lower end of the frequency sweep, and the pedal sweeps upwards from that point. Turning the Frequency knob all the way down to zero will therefore allow the pedal to sweep the filters across the full three octave range. Setting it near the midpoint will make the frequency control less “touchy”.

Keyboard expression pedals are not recommended, but may work passably well. Expression pedals typically use linear taper pots, which will affect the sensitivity of the sweep. If the pedal uses a 1/4-inch stereo cable with pot wiper on the Tip connection of the jack, it should be compatible with the QF2.

[You can modify a linear expression pedal to have a non-linear characteristic by adding a resistor from wiper to ground. Try resistor values somewhat smaller than the pot value. For example, try a 10K resistor across the output of a 25K linear pot.]

## **ADDITIONAL TIPS AND FAQ'S:**

Here are some additional tidbits that should help you get the most out of your QF2.

**Input Level:** As with any distortion effect, the QF2 is very sensitive to the level of the incoming signal. Turning up the volume knob on your instrument doesn't necessarily make it louder, it makes it fuzzier. This is essentially the same as turning up the Drive control on the QF2.

The same happens if you change instruments, like from a guitar with single-coil pickups to humbuckers, or to active-coil pickups. Line-level signals, such as from a keyboard, will drive the QF2 hard, so turn the instrument volume down to get to lower distortion levels. Also be aware of the output level of any pedal that you put in front of the QF2. Gain in an upstream pedal will act just like high Drive settings.

**Replicating Sounds:** It is often frustrating and difficult to replicate a particular sound effect, whether from your own previous setup, or someone else's. Even with the same controls settings on the QF2, the resulting sound can be quite different. The input level is the most significant factor as described above.

In addition, the instrument's pickup selection, its tone settings, and of course any other effects in the signal chain will all affect the sound, sometimes in somewhat surprising ways. In other words, the tonal character or EQ of the input to the QF2 can substantially affect the result.

The moral is, if you have trouble replicating a sound on the QF2, check what you are feeding it with.

**Expression Jack:** For true hackers only: The QF2 applies a DC voltage of about 8V on the Ring and 0V (ground) on the Sleeve connection of the expression jack, and expects a return voltage on the Tip connection varying from 0V to 8V. This is how it works with passive volume pedals and select expression pedals that have pots and cabling connections.

Since the return signal is a simple voltage, the QF2 frequency can be controlled by any external control voltage that falls within this 0V to 8V range. Remember that the frequency sweep will be linear with voltage. Modular synth components like LFO's, envelope followers, triggered ADSR's, etc. that produce a compatible control voltage might be fun to try. Proceed at your own risk.

**EXAMPLE TEMPLATES:**

[This section is still under construction. The intent is to show some control settings that sound particularly good, perhaps in conjunction with example sound clips on the Iron Ether website.

As an early adopter of the QF2, you can play a role in this process, by emailing sound and/or video clips along with control settings that you have discovered.]

**BLANK TEMPLATE:**

The following page shows a blank template that you can copy and then use to document your favorite setups. Just place pencil marks showing the position of each of the controls. Also, take the time to write down the other information, like a descriptive name for the sound, what instrument, amp, and other effects were used, and what songs or type of music you want to use it for.

Trust us, once you have found some particularly great sound, it is very easy to forget exactly what you did to get it. Write it down!

# Settings Template

Description: \_\_\_\_\_

Equipment: \_\_\_\_\_

Music: \_\_\_\_\_

