Calibration

Calibrating your compressor is a crucial step to ensure its proper operation. There are several ways to complete the four calibrations. I'll provide the way

we like to do it here at Hairball, but also present an alternative method shown in the MNATS calibration videos. Both work well, it's really a matter of

preference and equipment.

For the the Hairball method, you'll need a decent DMM that can read AC at 1KHz accurately. Usually any meter over $30 can read 1KHz AC signals well enough.

For both methods, it's important that you understand the difference between dBFS and dBu. The calibration of the compressor requires the use of a signal

generator and many users elect to use the signal generator inside of their DAW. The levels used by the DAW will be displayed in dBFS. dBFS is a digital

reference with 0 dBFS being the maximum level the onboard A/D converter can achieve before clipping. dBu is an older reference that is defined with 0 dBu equal

to 0.775 VAC .

Here's the scoop, there is no mathematical equation to convert dBFS to dBu since dBFS is dependent on the individual converter. That said, generally 0 dBu can

be found in the -16dBFS to -18dBFS range.

There's another problem. The FET Compressor has a very low nominal 600Ω input impedance. Generally we want our input impedance (FET Compressor) to be at least

10x the source impedance (signal generator) to avoid impedance loss. With an input of 600Ω, this is rarely the case. Generally sending 0 dBu from your

generator will result in a lower level at your input due to this impedance loss.

Confused? There is a simple fix for all of this. When asked in the calibration steps to send a 1K at 0 dBu signal to the input, use your DMM to measure the AC

voltage between lug 2 and 3 of the input XLR. Adjust your signal generator until you see 0.775VAC between pin 2 and 3. When you see 0.775 VAC between pin 2

and 3, you have 0 dBu at your input.

Q Bias
Q bias is easily the most important calibration step. Your compressor will not work without setting the q bias. If you're unsure why, go back and read the

introduction.

Here is how we set it at Hairball. Set the controls as follows.

Input = "24" mid rotation
Output = "24" mid rotation
Attack = full CCW (switched to off position)
Release = full CW
Compression ratio = 20:1
Meter mode = "GR"
Q-bias adjustment = full CCW
Shorting pin in "normal position" connecting the two pins closest to Q13

Apply a 1 KHz 0 dBu signal to the input and confirm with your DMM between pin 2 and 3 of the input XLR. Now move your DMM to the output XLR and measure AC

between pin 2 and 3. Adjust the output control to read +11dBu (2.75 VAC) on your DMM at the output. Slowly turn the Q-bias adjust (R59) CW until a drop of 1 dB

occurs, and your DMM reads +10 dBu (2.44 VAC). This places your gain reduction FET Q1 slightly into conduction.

Discrete Meter Circuit/Null Adjust
Disconnect your signal generator. No signal is required for this step.

Take R44 out of circuit by placing the shorting pin in the “short position” . This means the two pins furthest from Q13 are connected. Set your DMM to measure

DC volts and set it to measure the DC volts across R74.

Zero the compressors “GR” meter with the R71 zero adjust pot on the front panel
Adjust pot R75 (null adjust) for 0.0 Volts across R74.
Repeat 1 & 2 until both conditions are met.

Gain Reduction Meter Tracking Adjustment
This step sets your meter tracking so if your compressor is compressing by say 10dB, you see -10dB on the meter.

Start by setting your shorting pin back to the “normal position” which connecting the two pins closest to Q13. Your meter will most likely drop. Set it back

to zero by using the R71 zero adjust pot on the front panel. DO NOT touch the null adjust, it was set in the last step.

Set controls as follows.

Input = “24″ mid rotation
Output = “24″ mid rotation
Attack = full CW
Release = full CW
Compression ratio = 20:1
Meter mode = “GR”

Apply a 1 KHz, 0dBu signal, confirmed with your DMM at pin 2 and 3 of the input XLR (0.775 VAC).
Move your DMM to pin 2 and 3 of the output XLR.
Set output control for 0dBu (0.775 VAC) at the output.
Set attack full CCW (off position). Set input control for +10dBu (2.44 VAC) at your output XLR.
Turn the attack control OFF (CCW) and readjust the output level control for “0″ if necessary.
Repeat 3 & 4 until the output drops 10dBu whenever the attack control is turned ON. This can be a bit tricky. You’ll want to anticipate how one control

will change the other.

Distortion Trim

To adjust the R86 distortion trimmer, you need some specialized equipment that can measure Total Harmonic Distortion (THD). Some times you’ll see it listed as

THD+N which is the same measurement + noise. This calibration step is the least important. It might be the difference between having a THD measurement of

0.03% or 0.08%. If you can hear that, congratulations, you’re super human. It does have some effect on your Q1 GR FET, but again it’s minimal. If you don’t

have a way to measure THD, just leave the trimmer centered. If you have hardware or software to measure THD, here is how you calibrate it.

Input = Full CW
Output = to number “18″ on the front panel
Attack = full CCW (switched to off position
Release = Full CW
Compression Ratio = 20:1
Meter mode = “GR”

Apply an input signal of 500 Hz at -30 dBu (0.024 VAC) and measure THD of the resulting output signal. Adjust R86 until the minimum amount of distortion is

achieved.

If all of the steps went well it’s highly likely your compressor is working properly. Congrats! Now go plug it in and record some music!