Q3™
Coil Equalizer
500 Series Module

User Guide

Radial® Q3™ Coil EQ User Guide

Thank you for joining the growing number of Radial 500 series module users. We are confident that you will find the Q3 Coil Equalizer to be a great addition to your recording studio setup. And although the Q3 is 'plug and play' easy to use, we recommend that you take a few minutes to read through this manual to familiarize yourself with the design and more importantly, the reasoning behind the way we created it.

If for some reason you do not find all of the answers to your quest, we suggest you log onto radialeng.com and peruse the Q3 Coil Equalizer FAQ section. This is where we post questions and answers from users like yourself along with the latest updates. If you do not find what you are looking for, feel free to send us an email at info@radialeng.com. We will do our very best to get an answer to you in short order.

Now reach out, close your eyes, turn the dials and listen. You are about to hear Nirvana! (without all of the grunge)


⚠️ **WARNING NOTICE TO USER!**

Although preventative safety measures have been designed into Radial 500 series products **we strictly advise against hot-swapping modules** or plugging and unplugging them when the Workhorse or other 500 series rack is powered on. Hot swapping can cause connection sparks at the card-edge connector that could send damaging transients to other equipment. This also greatly reduces the life span of the card-edge contacts. Damage due to hot swapping is not covered under warranty. There are no user serviceable parts inside.

FEATURE SET

1. HIGH BOOST - 12 position rotary switch features a wide variety of high-frequency preset curves designed to add clarity, shimmer and presence to the voice on instrument.

2. SHIFT - This two position toggle switch changes the slope and amplitude of the preset curve. The SHIFT position offers an steeper EQ slope with increased amplitude creating a more pronounced effect.

3. MID CUT - 12 position rotary switch presents an array of eleven preset curves, most of which are designed to cut mid frequencies where the human ear is most sensitive.

4. BASS BOOST - 12 position rotary switch is outfitted with eleven preset curves designed to boost bass and add warmth, body and punch to the audio track.

5. HPF - High-pass filter rolls off excessive low frequencies that can cause resonant feedback on a live stage or clutter up the bottom-end of a track when mixing.

6. GAIN - Adjustable level control allows you to compensate for the EQ amplitude boost or cut and maintain unity gain through the Q3.

7. EQ IN - This switch lets you compare the original program material with the effect introduced by the passive inductor coil EQ circuit. The LED indicator will illuminate when the EQ is engaged.

8. OMNIPORT - Unbalanced ¼" TRS input and output receives a signal from an external device, processes it throught the Q3 and outputs the signal at the Omniport.
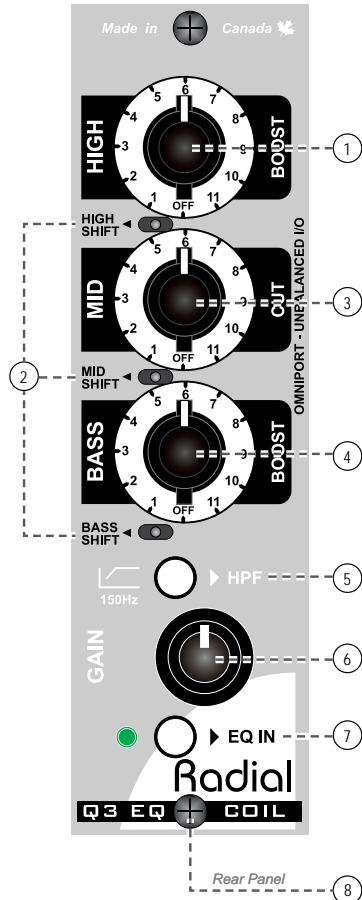
OVERVIEW

The Radial Q3 is different... it does not follow tradition. The usual 3-knob EQ approach is to select a frequency band using some sort of rotary switch, then set the Q or width of the peak frequency and then adjust the amplitude of the effect to suit. To create truly usable audio curves, you really need to combine multiple frequency bands together and mix their effects. In other words, to recreate the type of curves we have conjured up inside the Q3, you would need at least two bands and 6 control knobs. This is 'practically' impossible in a small format module like the 500 series as the controls would be so tightly packed, they would be unusable.
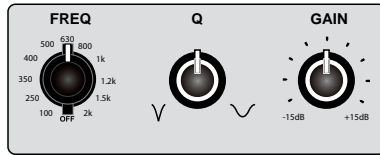
To fit a coil EQ into the 500 series format, a completely different approach was needed. The Q3 changes convention by giving the user a mind-numbing selection of over 12,000 EQ possibilities using only three knobs and a few switches. Each 12 position switch is packed with 11 preset curves that have been carefully selected after exhaustive listening tests. These were evaluated on voice, bass, acoustic guitar, electric and on drums and compared using both dynamic and condenser microphones.

We then set about testing how each curve would sound in tandem. There is no doubt that while some curves will sound amazing on bass, the same curve may not suit mandolin. But with well over 12,000 combinations, you will surely find lots of very usable sounds.
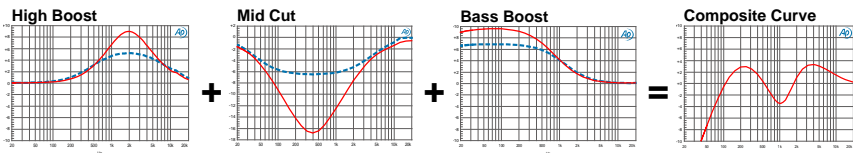
The 3-knob user interface is so natural and easy to use, that you will be amazed at how quickly you will become accustomed to it. And once you get started, you will find favourites that will surely become cornerstones of your recording process.

GETTING STARTED

Making connections

Before making any connections, start by turning off your audio system and turning all volume levels down. This helps protect equipment from turn-on transients that could damage loudspeakers and other sensitive equipment. We recommend using a power bar with a switch as this makes it easy to turn on and off the 500 series rack, monitors and so on, using a single switch. Carefully plug the Q3 into your 500 series rack avoiding stress on the card edge connector. Screw the module in to ensure it does not accidentally become dislodged.

Connections between the Q3 and the recording or PA system are made at the rear panel of your 500 series rack. Most 500 series racks are equipped with XLR connectors. When you plug the Q3 module into your 500 series rack, it will automatically route the card-slot input and output XLR jacks to the module. With the Radial Workhorse 500 series rack the I/O is augmented with ¼" TRS connectors, D-Subs and the Mix Buss signal to feed the Workhorse mixer section.

Start by setting up the controls as follows:

1. Set all HIGH, MID and BASS frequency band controls to the OFF position.

2. Make sure all three 'SHIFT' switches are pushed to the left (bold effect).
   This will help you to choose a preset curve that works best for the instrument at hand. Once selected the effect can be pulled back by toggling the SHIFT switch to the right.

3. Set the HIGH PASS FILTER to off (outward position).

4. Set the GAIN control to the 12 o'clock position.

5. Set the ON switch to bypass (EQ circuit out).

The Q3 is a line level device. In other words, it is designed to take the output from a mic preamplifier or pre-recorded track and process the signal before sending it along to a dynamic processor, effects device or back to the recorder.
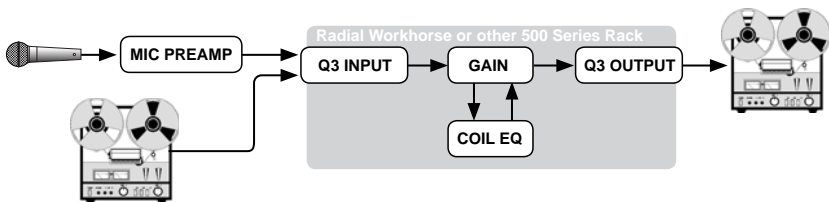
It is important to note that the GAIN control is always active. In other words, when you hit the bypass switch, you are actually bypassing the coil EQ circuits. This enables you to switch the EQ in and out to compare the effect at the same gain settings.

Connect the source to the Q3, connect the output from the Q3 to your recording system... turn it on. Listen. You should hear audio. If not, check your connections. To check the power going to the Q3, depress the EQ IN switch. The LED will illuminate if power is present in your 500 series rack. Now familiarize yourself with the GAIN control to check sound levels. If all is good, return it to the 12 o'clock start position.

Using the Coil EQ

The Q3 features three 12 position rotary controls that are designated as BASS, MID and HIGH. Each of these features on OFF position and 11 preset curves. Using a simple microphone and a set of headphones, start by familiarizing yourself with the various EQ curves in each band. As some of the EQ curves are very dramatic, using headphones will help to eliminate feedback from occurring.

Note that the HIGH and BASS bands are made up of mostly boost type presets while the MID band is made up of mostly cuts. This follows the way we humans like to 'hear' sound. Keep in mind, the Q3 is not intended to be a surgical tool, it is designed to enthral and excite.

When using subtractive curves, you will notice that the sound level will appear to drop. This is normal. Simply adjust the level by increasing the GAIN control to compensate. Be careful! The Q3 has lots of gain!

⚠️ **CAUTION!**

One of the drawbacks to passive coil EQs is that there is no noise preventative circuitry between the induction coil circuit and the signal path. This means that when you switch coils, you can encounter clicks and pops. Always monitor at reduced levels while setting up the Q3. This will help avoid popping which in turn could damage more sensitive equipment.

Using the 'Shift Key'

One of the cool features on the Q3 is the SHIFT switch. When set to the right, the effect of each curve is gentler. When moved to the left, it is bolder and more prevalent. This enables you to listen to various curves to determine if the general effect is going in the right direction and then lets you either add or subtract the effect, depending on your musical taste.
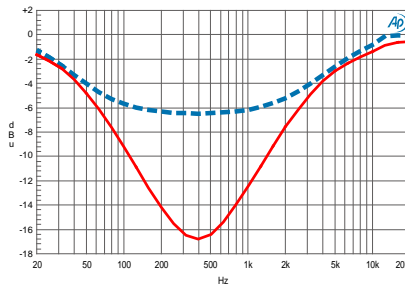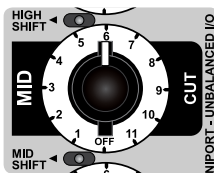
The dashed line represents the standard curve and the solid line represents the "shifted" curve.

Note: As the space between the 12 position rotary switches is very tight, the easiest way to move the shift switch is to use a pen or tweaker. This is the downside to jamming all of this control into a 500 series format!

Using the High-Pass Filter

The Radial Q3 is equipped with a switch labelled HPF that stands for high-pass filter. What this switch does is exactly that... it allows the high frequencies to pass... therefore cutting out some of the lows. The HPF can be very effective when recording to eliminate excessive bottom-end. Some EQ settings can cause certain instruments to sound muddy and clutter up the recording. Keep in mind that bass frequencies contain a lot more energy than highs, so they affect dynamic range and distortion. High-pass filters are also a 'God-send' in live touring as cutting excessive bottom end eliminates resonance which is the primary cause of feedback. Simply press, listen and then take out to compare.

Using the Omniport

When the Q3 is used with a Radial Workhorse or one of our other 500 series power racks, the Omniport connection becomes available and in this case, it functions as an unbalanced input and output.
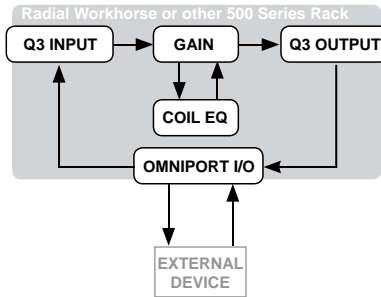
While the XLR and ¼" TRS jacks on the Workhorse are balanced, the Omniport connection is unbalanced making it easy to connect to the unbalanced insert patch point on a console. Note that the balanced XLR I/O should be left unconnected when using the Omniport function. The easiest way to connect to the Omniport would be to use a TRS-to-TRS cable. Simply make sure the wiring is configured as follows:

SOURCE
Tip = Send
Ring = Receive
Sleeve = Ground

Q3 Omniport
Tip = Input
Ring = Output
Sleeve = Ground
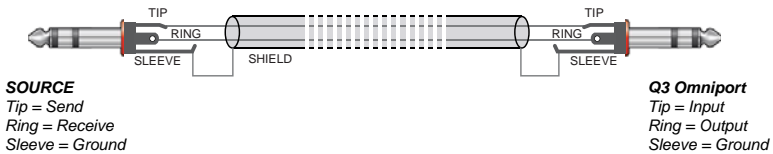
Q3 PRESET EQUALIZATION CURVES

Although printing the preset curve data is somewhat superfluous, we have decided to include it in the manual so that you can get a 'visual' of what each individual preset curve looks like. DO NOT get caught looking at curves to make audio decisions. Use your ears! Once you get started, you will find that getting around the Q3 will be very natural and incredibly quick.

HIGH BOOST PRESETS
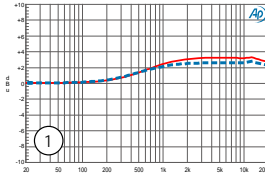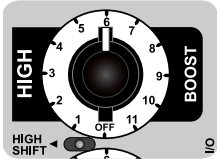
+3dB High Shelf
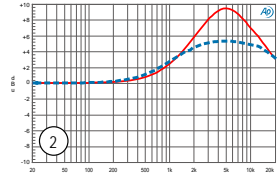
+9db @ 4.8 KHz
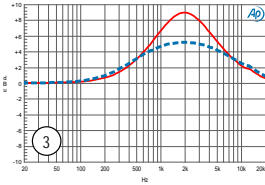
+9db @ 2KHz
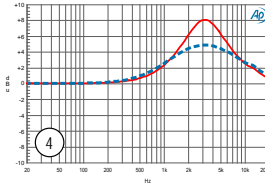
+8db @ 3.2 KHz
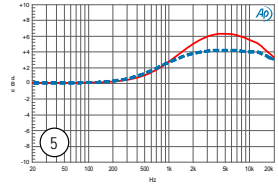
+6db @ 4.5 KHz
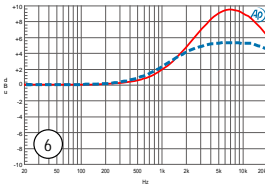
+9db @ 7 KHz
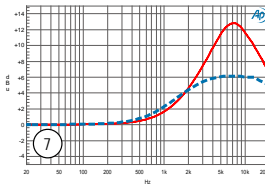
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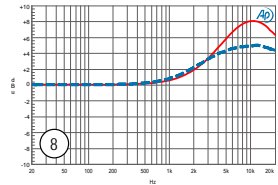
+8db @ 10 KHz
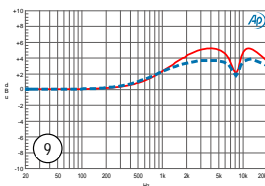
+5db High Shelf with 8KHz Notch
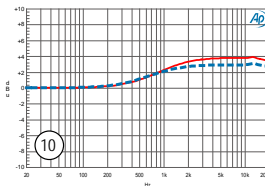
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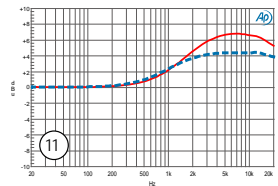
+7db @ 7 KHz

MID CUT PRESETS
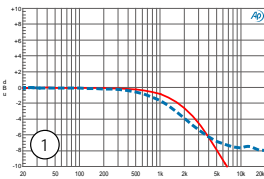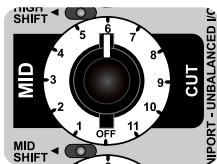
High Cut @ 2.4 KHz
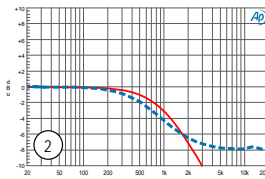
High Cut @ 1 KHz
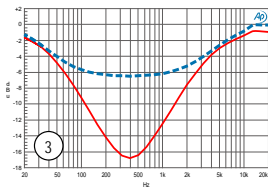
-16db @ 400 Hz
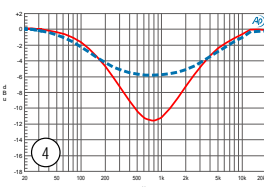
-11 db @ 800 Hz
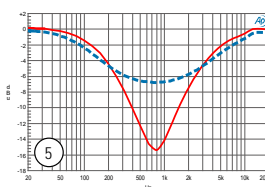
-15 db @ 800 Hz
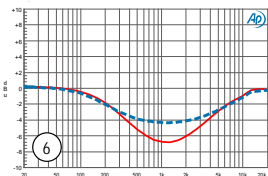
-7db @ 1.2 KHz
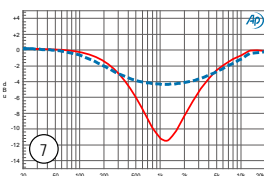
-11db @ 1.2 KHz
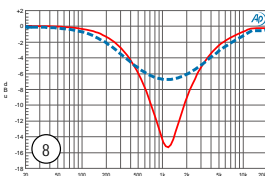
-15db @ 1.2 KHz
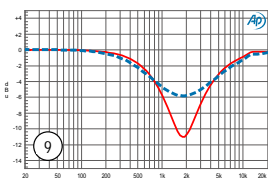
-11db @ 1.8 KHz
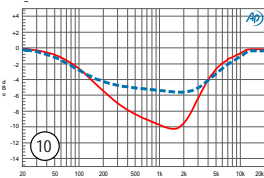
-10db @ 1.5 KHz Shaped
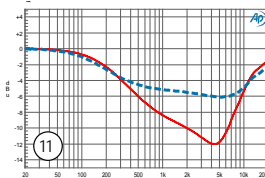
-12db @ 3.5 KHz Shaped

BASS BOOST PRESETS
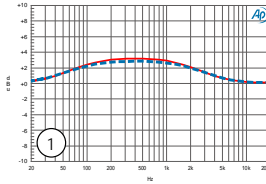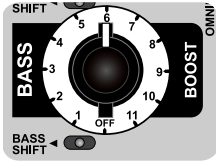
+3db @ 400Hz
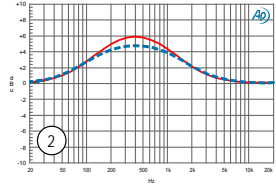
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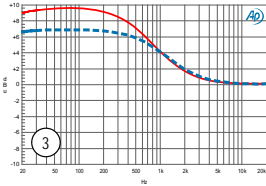
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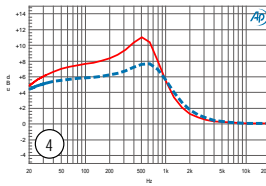
+11db @ 500 Hz
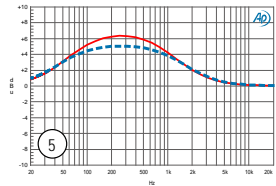
+6db @ 250 Hz
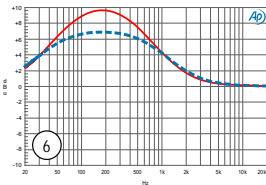
+9db @ 180 Hz
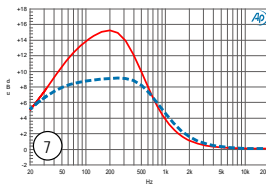
+15db @ 200 Hz
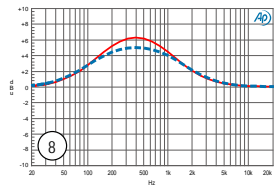
+6db @ 350 Hz
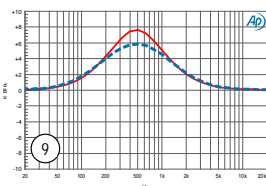
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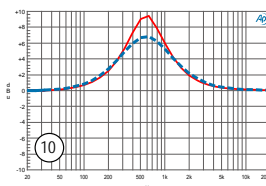
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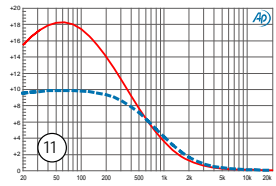
+18db @ 60 Hz

SUGGESTED SOUND SETTINGS

NAME:
Jazzy Bass

Inst:
Fender Jazz Bass

Pickups:
Neck PU

HPF:
Off

NAME:
Marcus Funk

Inst:
Fender Jazz Bass

Pickups:
Both

HPF:
On

NAME:
Smooth Frettless

Inst:
Fender Frettless Jazz Bass

Pickups:
Neck PU

HPF:
On

NAME:
Bright Reggae

Inst:
Fender Stratocaster

Pickups:
Singlecoil Bridge & Middle PU

HPF:
Off

NAME:
Quiet Moment

Inst:
Gibson Les Paul

Pickups:
Humbucker Neck PU

HPF:
On

NAME:
Finger Pickin'

Inst:
Acoustic

Pickups:
Magnetic in Soundhole

HPF:
Off

SUGGESTED SOUND SETTINGS

NAME:
*Strumming
Sunday*

Inst:
*Acoustic
Guitar*

Pickups:
*Piezo &
Magnetic*

HPF:
On

NAME:
Call Me Elvis

Mic:
*Dynamic
Vocal*

HPF:
On

NAME:
FM Radio

Mic:
*Dynamic
Vocal*

HPF:
Off

NAME:
Sticky Pop

Mic:
*Condenser
Vocal*

HPF:
On

NAME:
Fat Girl

Mic:
*Condenser
Vocal*

HPF:
Off

NAME:
Open Kick

Inst:
Kick Drum

HPF:
Off

SUGGESTED SOUND SETTINGS

NAME:
Stupid Bass

Inst:
Kick Drum

HPF:
Off

NAME:
Slap Kick

Inst:
Kick Drum

HPF:
Off

NAME:
In Your Face Snare

Inst:
Snare Drum

HPF:
On

NAME:
Big Chest Snare

Inst:
Snare Drum

HPF:
Off

USER SOUND SETTINGS

NAME:

Inst:

HPF:

GAIN:

NAME:

Inst:

HPF:

GAIN:

NAME:

Inst:

HPF:

GAIN:

NAME:

Inst:

HPF:

GAIN:

NAME:

Inst:

HPF:

GAIN:

NAME:

Inst:

HPF:

GAIN:

Q3 COIL EQUALIZER 500 MODULE SPECIFICATIONS*

Circuit type.................................... Coil/Capacitor/Resistive Boost and Cut Filters

Frequency Response .... 20Hz-20KHz +/- 1db in non EQ positions

Dynamic Range............................ >112dB

Noise .... <-90dBu (600 ohm source impedance - filters Off)

Noise .... <-87dBu (600 ohm source impedance - filters On)

Output Headroom......................... +27dBu

Clip Level - Input........................... >+20dBu

Clip Level - Output........................ +27dBu

THD+N .... <0.003% (0dbu input at 1 KHz)

Intermodulation Distortion............. <0.002% (0dbu input)

Input Impedance........................... 12K balanced

Output Impedance........................ 440 Ohms balanced

Equivalent Input Noise.................. -100dbu

Gain.. 7db (at maximum, EQ bypassed)

Omniport Function........................ Unbalanced Input / Output (input = tip; output = ring)

Power Requirement...................... 25mA

Shipping Dimensions:................... 171 x 51 x 229mm 0.7 kg (6.75" x 2 " x 9" 1.5 lbs.)

Warranty .... 3 Years, transferable

CONNECTOR WIRING
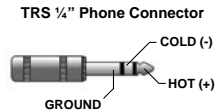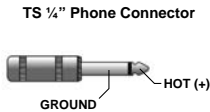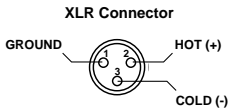
BLOCK DIAGRAM*
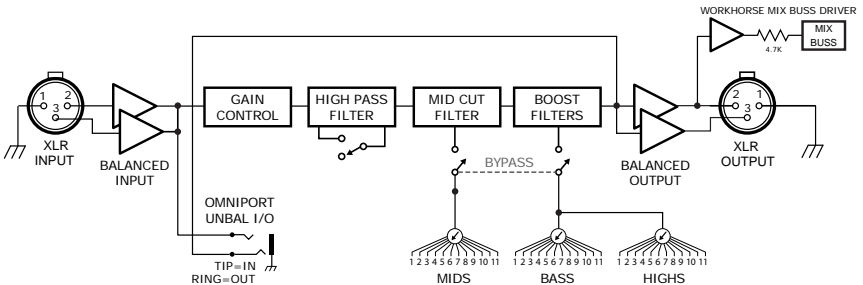
Subject to change without notice.

THREE YEAR TRANSFERABLE LIMITED WARRANTY

⚠ This product is intended for professional use only. The user should be familiar and experienced with the 500 series rack and module format

Radial ®
engineering

True to the Music

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