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Focusrite ISA 110

Mic Preamp & Parametric EQ

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By [Paul White](#)

Published [June 2000](#)



Paul White takes a newly reincarnated Focusrite classic for a spin in his studio and discovers that sometimes, they do make things like they used to.

The first commercial Focusrite product was a combined equaliser and mic preamp designed by Rupert Neve, who set up Focusrite back in 1985 after parting company with Neve Electronics. Commissioned by Sir George Martin for use at AIR studios, this new unit was called the ISA 110 and combined a classic Neve equaliser with a high-performance, transformer-coupled mic amp. It was subsequently sold in racks of multiple channels to high-end studio owners.

When Focusrite was bought out in 1989, Rupert Neve went on to explore new horizons with other companies, but his ISA 110 circuit design was to play a central part in the Focusrite Studio Console. Now, some 15 years after its launch, the ISA 110 has been reincarnated as a stand-alone, single-channel 1U rack unit (a dual-channel ISA 215 model is also available). The all-solid-state circuitry is faithful to the original (with the exception of the integral power supply and the insert point), and though the new model is designed to be used horizontally rather than vertically, its control layout and colour scheme are extremely close to those of the 1985 version.

Layout

All the connections are on the rear panel of the rather deep case, and include balanced jack send and return points that allow the mic amp and EQ to be used independently, or for a further processor to be inserted between them. The output is on a balanced XLR with gold-plated pins, providing a maximum level of +26dBu. The preamp has both mic and line input XLRs with front-panel switching, along with switchable 48V phantom power. The same transformer-coupled mic amp circuit has been used in several high-end Focusrite products, including the Red range, and uses stepped gain controls for both the mic and line inputs coupled with a variable Trim control for fine adjustment. If the trim range is included, the mic amp gain range covers 0 to 70dB, while the line gain can be varied from -18dB to +28dB, and can accommodate line levels of up to +26dBu.



All of the connections are on the rear panel and include balanced jack send and return points.

According to the frequency-response plot, the mic amp is flat up to around 20kHz after which the response actually rises before falling away again above 50kHz. The mic amp noise figure is -123dB EIN (Equivalent Input Noise) for a 150Ω source, and in use, the ISA 110 preamp is extremely quiet at all operating levels. It also boasts a THD (Total Harmonic Distortion) figure of 0.0008 percent, which is orders of magnitude better than most designs. Even the mic input can handle input levels of up to +26dBu without needing a pad, which also makes for a better noise performance when working with hotter signals.

As the original control layout has been retained, the mic amp is located at the right-hand side

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of the channel rather than at the left where you'd normally expect to find it. As circuit-board layout can affect audio performance, my guess is that the guys at Focusrite didn't want to be left open to accusations of 'messing around' with perfection, though as a concession to progress, the preamp gain controls are offset slightly from their original locations! A phase switch is included for when multiple ISA 110s are used on the same session where individual signals may need to be phase-reversed relative to others. There's also an overload lamp that looks very like the switches, but there's no mic amp level meter and no overall output level control. These days you could be feeding anything from standard +4dBu analogue equipment to digital converters that want to see a full +20dBu before they'll concede to register a peak level, so it could be argued that better metering would make sense, even if it would be departing from the original design.

The EQ section is preceded by a pair of switchable high- and low-pass filters to 'bracket' the area of interest, each having a third-order, 18dB/octave response. Both filters are controlled by six-position rotary switches that can either be off or set to one of five preset frequencies: the low-pass can be set to 3.9kHz, 5.6kHz, 8.2kHz, 12kHz or 16kHz, while the high-pass provides a choice of 36Hz, 60Hz, 105Hz, 185Hz and 330Hz.

The main equaliser is divided into two further sections, each with its own in/out button, though there's also an All EQ button that can take the whole EQ out of circuit (but not the high- and low-pass filters) in one go for easy A/B comparisons. First comes the high/low shelving EQ section, again controlled by a pair of six-position rotary switches. These bring in different capacitor values for optimal performance at each frequency, and the switched-capacitor filter design used here has a lot to do with the classic Neve sound. Cut/boost is continuously variable, with centre detents and a maximum range of around ± 18 dB. The frequency values for the low shelf EQ are 33Hz, 56Hz, 95Hz, 160Hz, 270Hz and 230Hz, while the high shelf offers 3.3kHz, 4.7kHz, 6.8kHz, 10kHz, 15kHz and 18kHz.

To the immediate right of the shelving equaliser is a two-band parametric section, the filters of which have a band-pass response and fully variable centre frequencies. To make setting up more precise, the frequency knobs are switched to operate over two ranges via a x3 button. The circuitry is optimised such that the first band spans 40Hz to 1.2kHz (using the x3 range button), while the second band covers 600Hz to 18kHz. No Q values are marked on the scale — there are only graphics to indicate narrow or wide responses, and the same simplicity of approach applies to the cut/boost controls.

Impressions

Though the bright primary colours and modern plastic knobs somehow seem to undermine the seriousness of this product, there's no arguing that they make the front panel very clear and easy to navigate. In any event, they're true to the original, so it would be more than a touch sacrilegious to change them. But nobody buys a piece of Rupert Neve-designed electronics to look at — it's the almost magical sound that matters, and the present Focusrite engineering team have been wise enough to follow the original design extremely closely.

The ISA 110 EQ section is something of an analogue classic and is optimised to do what your ears demand rather than what the test equipment expects. Areas within a mix can be emphasised without compromising the overall integrity of the sound, and unlike cheaper equalisers, making adjustments at the bass end keeps the sound solid and completely under control, even when the amount of boost required is substantial. At the other end of the scale, you can focus in on high frequencies without making the sound harsh, phasey, nasal or any of those other deprecating descriptions that apply so aptly to most budget equalisers.

For more gentle adjustments, the shelving filters are perfect for adding in warmth or high-end transparency without changing the overall character of the sound, and I find it hard to imagine filters that could sound much better than these. You get all the musicality and control of the best vintage equipment without suffering noise, price or reliability penalties. And before you correct me, I know the ISA 110 isn't cheap, but you can pay an awful lot more for a piece of second-hand 'vintage' gear that is difficult to service and hard to find spares for.

The inclusion of the high- and low-pass 18dB/octave filters makes the ISA 110 a good problem-solving tool, as you can effectively skim away hum and rumble from below a vocal part without affecting what you do want to hear, or get rid of unwanted hiss and high-frequency artifacts in sounds that don't stray that far up the spectrum, such as electric guitars and basses. The mic amp is clean, smooth and very accurate, conveying a sense of what can only be described as transparency or air. It puts nothing detrimental between the source and the recording equipment — and of course if you don't need the EQ, you can come straight out of the balanced insert send and into the recorder.

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Conclusions

With high-resolution digital recording becoming commonplace, the importance of a good front end has never been higher. A mic preamp is like the lens on a camera — lose definition at the start of the chain and you'll never get it back. Admittedly the ISA 110 still costs a lot when you consider that you're getting a mic amp and a set of tone controls for the price of a large-screen TV with surround sound, and of course I wouldn't be doing my job if I didn't criticise areas of weakness. I feel that the almost total lack of level metering is one of those weaknesses. The panel graphics also provide few clues as to what values the settings really are: in both cases, I would have preferred it if the designers had strayed slightly further from the original design! Keep in mind, also, that the rest of the signal chain needs to be up to scratch too; this is a serious, professional tool and won't give of its best in amateur company.

That said, however, the ISA 110 provides one of the nicest-sounding mic preamps you can buy plus a classic Neve-designed equaliser that meets pretty much any creative or corrective challenge with panache. In a typical project-studio situation where most of the audio parts are overdubbed individually, a product like the ISA 110 could make a lot of difference to the quality of the end result.

Without Equal

Equalisation is a strange subject — on initial consideration, all that seems to be required is for it to be able to control the levels of different parts of the audio frequency spectrum without adding distortion. Indeed, some digital equalisers fulfil this simplistic definition, but they sound nothing at all like a high-quality analogue equaliser such as the ISA 110. If something sounds harsh, a good analogue equaliser will smooth over the rough edges without making the sound dull, whereas lesser designs might just take down the level of the offending sounds without making the necessary changes. This is attributable to a number of things (leaving aside poor circuit design that runs out of headroom when cut or boost is being applied), though it's generally thought that the shape of the EQ response curves and the subsequent phase shifts these introduce have the most influence.

Pros

- Super classy sound.
- Extremely musical equaliser.

Cons

- No metering other than an overload lamp.

Summary

Now that this classic Focusrite design is available as a single, self-contained unit, it is particularly attractive to the more advanced project-studio owner who wants to own and use one really high-quality input device.

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