Calrec Sigma Bluefin

Take an industry standard live broadcast production 48k desk and more than double its channel count in preparation for the 5.1 broadcasting future through a cost-effective and simple upgrade. ZENON SCHOEPE encounters a remarkable technological development.

I**T'S A POPULAR** belief that pretty much all digital consoles do pretty much the same sort thing in pretty much the same sort of way; the main differentiating factor is the worksurface. How you access the processing is the main part of what makes it 'a desk', gives it its character and ultimately decides how successful and appropriate a system is for a given function. Just as the performance curve in computing has been flattening in recent years with the incremental improvements in speed and 'power' being less spectacular, the playing field in digital desk processing has been levelling too. That's until NAB this year.

In a rather low-key way Calrec announced what was, on the face of it, a groundbreaking development in high density digital processing and how, for its flagship Alpha, it had provided 200% more processing power in 92% less physical space and at no extra cost.

Called Bluefin technology, it is a proprietary architecture that has been conceived and developed entirely within Calrec as a response to broadcaster's requirement for producing live 5.1 content as it gives the Alpha console the capability to provide 78 full 5.1 surround channels or 480 equivalent mono signal paths on just one card.

The best bit is that any Alpha could be retrofitted with Bluefin meaning that you could upgrade your desk to full current spec — something that is common in the software business but unheard of in digital desk hardware.

Bluefin is Calrec's digital platform moving forward and it is now available for its Sigma console — commonsense tells you that the Zeta is likely to follow.

So what is Bluefin and how does it work? They won't tell me. That's not a case of Calrec being deliberately obstructive or mysterious, it's because Calrec believes it has hit on something so significant that it has a jump on its competitors and it's not about to share it. What they will say is 'it's a software concept that ties together the latest and fastest chips with existing technologies in a unique way'... Unenlightened, then, I will try to highlight the differences that Bluefin brings to the Sigma in its original, or Classic, form.

More than doubling your channel count has an operational impact on a worksurface's ability to harness it elegantly and flexibly and some changes have had to be made to accommodate this. One of the clever things about the Calrec family of live broadcast production desks is that they share a common DSP and worksurface principles are carried down the range. It is scale that differentiates them. The bottom of the fader to the top of the source displays is identical across all consoles and you get a more elaborate central control system — the channel controls — the further up the range you go.

Bluefin's influence on the Sigma's worksurface is most apparent in the I-O Matrix and routing panel and the Mains and Auxes. Classic Sigma has 24-track routing buses whereas Bluefin has 48 and this requires twice as many routing buttons and a new panel. In terms of Auxes, the Classic has 12, the Bluefin 20 and the panel here has been changed to increase the number of required controls.

The business of upgrading your Sigma to Bluefin does offer a variety of options as in some cases your worksurface panels can be modified rather than replaced but the permutations are fairly complex, have cost implications, and are best assessed by Calrec. As an example, Bluefin works with the old style and new style monitor panel but the new panel gives much more flexibility — so it's also a matter of choice. But, upgrading a Classic would involve swapping out four panels including the EQ panel as Bluefin adds 4-band EQ in the dynamics sidechain.

While we've been talking about the Classic Sigma we ought to mention the Sigma Plus, which heralded some significant worksurface changes as it was, in retrospect, a stepping stone towards Bluefin. The Plus added 5.1 channel handling in the same way as a stereo channel, TFT metering (including input metering) to display it, and a new monitoring panel to hear is more flexibly.

Star of Plus is the Spill panel, which gives you four dedicated faders to adjust the legs of 5.1 channel signals. The Sigma, like all Calrecs, has the most straightforward of operating principles. There are only two layers per fader accessed on dedicated buttons locally and globally across halves of the desk. Green is the colour for layer A, Orange is B layer. Red is the assigned fader. An active channel has all its channel parameters available for adjustment on the central control panels and if it's a 5.1 channel then you can tweak its legs on the Spill panel. Wild controls above the channel faders give local direct access to four channel parameters. You can also lock one fader to the central control area so that one crucial mic signal, for example, can be kept to hand regardless of any other channel tweaking going on.

With a fully-filled Sigma Classic you'd have 48 stereo channels and 24 mono channels or 120 mono legs. A Sigma Bluefin gives you 320 mono legs configured as 108 stereo channels and 104 mono channels. Calrec builds a 5.1 channel from two stereo channels and two mono channels — LR, LrRr, C and .1 — and that's exactly what the four faders in the Spill panel represent. EQ or dynamics that you apply to the 5.1 channel is applied to all legs or, more typically, you can break them out and apply the processing selectively on the individual legs via switches on the Spill panel faders and isolate the .1 leg from any tweaking. You also have Cut and PFLs in this section. Auxes are mono or stereo and if you send an aux from a 5.1 channel it will be a downmix of it.

That's very simple but very powerful control over 5.1 and you're going to need it if you're going to be broadcasting in 5.1. Calrec's market research among its multichannel broadcasting users suggests that every source that was stereo will have to be 5.1 because if you're making a programme in 5.1 it's the currency you have to deal with. It also makes productions simpler and more consistent.

Bluefin groups are also 5.1 — you get 4 surround mains, 8 surround groups — and the mix minus system feeds a downmix of 5.1 where applicable. A very big issue for HD in live TV, which most will be aware of, is the problem of delay and this has been expanded substantially on Bluefin and allocated to inputs, inserts and outputs — 19.6 minutes of audio delay divided into 432 mono elements of 2.73s.

Every channel and group can produce a direct output simultaneously and all surround channels and groups have surround direct outputs with the option of downmix to stereo.

Despite the fact that in channel count terms the Bluefin Sigma is a very big desk, operationally it is the simplest I have encountered. You get so much quality information from the surface. TFTs do meters only — there's no extra unnecessary EQ curves and dynamics approximations fighting for your attention — and a calm, comfortable logic runs throughout. And that's important because the density of 5.1 channels attainable here is a little frightening when you think about it. Additionally, because there is so much DSP on tap you won't have to worry about unexpectedly running out of desk.

Automation is snapshot only and you could argue that the increased channel count could make a call for dynamic automation something of a requirement, particularly as broadcasters are likely to at least want the option to post with such a board. You could also argue that a cosmetically redesigned worksurface might be in order to better mark this technological leap but I can understand why Calrec has addressed the processing first and enhanced the existing worksurface to harness it. That's the sensible way for Calrec and it also makes best sense for customers. If Bluefin was only available in brand new products I would not be nearly as excited about it as I am.

In terms of upgrading a Sigma rack, the fastest option for busy studios is a straight swap to a Bluefin rack but you can run the new cards in your existing rack. For a Classic, you replace something like 12 old DSP cards with two Bluefin cards. On an Alpha it is even more dramatic as a fully-loaded Classic Alpha's 26 DSP cards, including redundancy, are replaced with just two Bluefins. With Bluefin, the whole DSP system runs on one card and your redundancy is the other one. I asked for a card reset to see how the redundancy kicks in and all I heard was the audio

fading down and back up very gracefully and quickly — sub-second. Your I-O system remains the same.

A typical Sigma Bluefin would be priced around UK£185,000 and upgrades to existing desks work out between 30% and 40% of the original list price depending on the age and configuration of the desk. Such an upgrade would turn a Sigma into a desk more powerful than the largest Alpha console available at the time of the original purchase. Remarkable.

The whole Bluefin development is a highly unusual one in the console market. The ability to upgrade an older product in this manner is unprecedented and the price for doing it is not major when considered as a return on investment. Calrec Sigma owners are very fortunate to have this opportunity because it gets them out of the potentially sticky problem of how to go 5.1 as cheaply as possible without cutting corners. Bluefin future-proofs their consoles.

I believe Bluefin is the most significant development in digital desk technology since the mass availability of the SHARC got the ball rolling. However, I can't hide that I am uncomfortable with the fact that I don't know how it works.

Even so, the results speak for themselves. It's not expensive to upgrade to, the hike in processing and its control is fantastic and Calrec won't tell anyone how it's done it. I therefore have to conclude: it's magic. ◼

PROS	The best way to future-proof a Sigma for 5.1; phenomenal increase in performance; cost-effective; brilliantly simple but powerful interface.
CONS	Nothing much; you don't get a brand spanking new worksurface; no dynamic automation.

Contact

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