JDK Comp R22

Dual-channel Compressor

This compressor offers automatic time constants to help to keep things sounding natural, even with plenty of gain reduction. Is it a weapon worth adding to your arsenal of mix tools?

Paul White

US-based company API date back to the 1960s and already have a well-respected range of audio products, but they launched a new brand, 'Arsenal Audio by API', to give themselves a space to develop some new ideas. We reviewed the debut Arsenal products, the R20 mic preamp and the R24 stereo EQ back in *SOS* February 2009 (www.soundonsound.com/sos/feb09/articles/arsenalaudioprocessors.htm), but since then electronics company JVC alleged confusion between API's new brand and their own Arsenal-trademarked in-car audio systems... and with the possibility of legal action, API were forced to come up with a new name, and settled on JDK Audio.

Design & Construction

We're told that the new JDK R22 dual-channel compressor is based on the compressor circuit used in the ATI Paragon mixing console (ATI and API merged towards the end of the 'nineties). Each of the compressor's two channels includes the charmingly entitled 'Thrust' switch, to prevent high-frequency detail being trampled when high-amplitude bass sounds are dominating the gain-reduction process, especially at higher compression ratios.

It looks like a very friendly and uncomplicated compressor, with an appealing hint of vintage chic to its styling and, other than the 'Thrust' switch, the controls should be familiar to anyone who's ever used a compressor.

The moving-coil VU metering is switchable between output level and gain reduction, and both channels may be linked for stereo use, with true RMS power summing of the left and right signals. In linked mode, both channels apply the same amount of gain reduction, regardless of whether the two audio inputs are at the same level or very different: this commonly used strategy avoids the stereo image shifting whenever one channel applies more gain reduction than the other, which would happen if the two compressors were allowed to work independently. The US switch-convention of 'on is up' applies, so the Link switch links the two channels when in the 'up' position, not the 'down' position.

The use of true RMS power summing is also important, because if a compressor's side-chain signals are summed before being converted to a control envelope (in other words, by summing the audio signals prior to rectification and RMS level detection), phase differences between the two channels can have a profound and unwanted effect on the amount of gain reduction applied. For example, consider the situation where two identical high-level signals enter the two channels, but one is polarity inverted. If these signals were summed before generating the control envelope, no signal would be detected, because the two side-chain inputs would cancel on combination — and, as a result, no gain reduction would be applied. Doing the RMS conversion separately for the two inputs requires part of the circuitry to be duplicated — but now that the control signals, not the audio, are being summed, the correct level is detected, regardless of any phase differences between the two inputs.

Although no documentation came with the review unit — and the information available ▶

Sound On Sound

JDK Comp R22 **$1195**

pros
• Affordably priced.
• Extremely simple to set up and adjust.
• Excellent subjective results on a wide range of input sources.

cons
• No side-chain access.

summary
If you want a musical-sounding, versatile compressor but don't want to spend a fortune, you owe it to yourself to check out the JDK R22.

▶ on the company web site is a little short on technical insight — examination of the circuit board shows this to be a VCA compressor that uses the very highly regarded THAT 2181 Blackmer voltage-controlled amplifier IC, which is a chip based on circuitry developed by David Blackmer while he was still working for Dbx. These chips offer control over a wide range of gain, combined with low noise and extremely low signal distortion. They're generally regarded as being the best performing audio gain-control devices that are commercially available. The design also uses THAT chips in the output stage, specifically the high-performance THAT 1646 line driver.

Outwardly, this compressor looks very traditional, in its 2U-high, 10-inch-deep rack case, with a clearly screened khaki-green front panel that the Ministry of Defence would be proud of. It even has those old-school handles on the front for lifting it in and out of the rack.

The standard of construction is impressively high, and the internal wiring has been kept to a minimum. One large, double-sided PCB hosts the main body of the circuitry, and the line-level input and output sockets are soldered directly to the board. The connectors are fixed firmly to the rear panel, which means that there's no stress placed on the board when plugging and unplugging cables. Each of the two inputs and outputs are available on both balanced TRS jacks and balanced XLRs. It's worth noting, though, that there's no external side-chain access.

A second, large PCB assembly for the power supply is located at the opposite end of the case, to minimise potential interference with the audio circuitry. This is a conventional 'analogue' power supply, which is fed from a generously rated toroidal transformer and uses standard regulator chips. A rear-panel slide switch selects between 110 and 240V operation, and power comes in on a standard IEC socket, controlled by a power on-off switch on the front panel. There are two small boards on the front panel, which hold most of the controls, and these are connected to the main board via ribbon cables.

Both channels feature identical controls, comprising rotary pots for threshold, ratio and gain, plus toggle switches for Thrust/Flat, soft/hard knee, and meter switching (from gain reduction to output). An LED comes on to indicate when the input is above the threshold. Further toggle switches handle channel linking and individual bypass for each channel. In linked mode, the left-hand channel controls become the masters. There's a conspicuous absence of attack or release

controls — but that's because the circuit is designed not to need any! The time constants react both to the incoming programme dynamics and to the settings of the threshold and ratio control, automatically adjusting the attack time from 10 to 40ms and the release time from 30 to 400ms. This is definitely good news for those who have a natural fear of compressors: if you set the ratio somewhere in the middle and then adjust the threshold to get the right amount of gain reduction, the chances are that it will sound good!

Performance

Aside from the simplicity of operation afforded by the lack of attack and release controls, the first thing I noticed about this compressor was that it managed to retain the sense of life and space in the original signal, even at relatively high levels of gain reduction — and that's before engaging the Thrust switch. As you'd expect, the soft-knee setting produced a less obviously compressed sound, whereas the hard-knee option was a little more assertive. On bass guitar, the other compressors I tried for comparison all imparted a useful character, but they seemed somehow to make the sound feel less 'present'. Not so the JDK: bass guitar parts became more solid and even-sounding, but even when there was so much gain-reduction that you could really hear the compressor working, the signal still retained its life. It's hard to describe anything as subtle as compression in words alone — but you'll probably understand what I mean when I say that the JDK compressor made the bass part sound the way I wanted it to sound with virtually no effort. All I did was set the ratio

to around 5:1 and then adjust the threshold. Both soft- and hard-knee settings sounded *good*, with hard-knee mode resulting in a bit more attack and punch.

Of all the plug-in compressors I tried for comparison (some of which were quite expensive), the ones that sounded closest were the UAD 1176 and — perhaps surprisingly — Logic's bundled compressor when set to VCA mode. Switching on the Thrust feature seemed to boost the low-end level by half a dB or so, making everything seem a little warmer as well as brighter, but this subjective level change was far less evident with other sound sources.

I got the same kind of instant gratification on acoustic guitar, and switching on Thrust added a little high-end sparkle to the recording in a very subtle way. I know that some Drawmer compressors incorporate a system that allows some high end to bypass the gain-reduction stage in order to keep the transient detail sharp. There's a similar quality here — and although I don't know if the JDK works in the same way, I certainly liked the result, which sounded well controlled and natural.

The JDK's ability to compress without pushing the sound back in the mix really came to the fore on vocals. The level evened out, as you'd expect, but the sound also seemed bigger and more confident

— and at higher levels of compression, where the process became more obvious, it was still very musical. For the track I was working on, soft-knee mode gave the best results, but it's good to have both options. It was almost as though the original sound was like a partially inflated balloon that the JDK brought up to full pressure, smoothing away all the wrinkles and making it generally firmer.

On drums, the compressor seemed to be particularly transparent-sounding, as it was possible to apply quite a lot of gain reduction

before you could hear that the sound was being compressed at all. Again, I heard the same tightening effect that I'd noticed on vocals — with any 'beach ball' tonality in the kick drum emphasised and strengthened, but not at the expense of definition. Again, both soft and hard-knee processing produced great-sounding results, and it's nice to have the choice of which you use on different material.

My final test was to use the compressor in soft-knee mode on the mix bus, with a ratio of under two and a maximum gain-reduction of 5-6dB. The overall sound changed very little, but the compression helped to glue the components together in a musical way, with the compression itself not seeming at all

obvious. For me, that's what a bus compressor should do: I don't usually want my mixes to sound compressed, I just want them to sound strong and well integrated.

Verdict

I found the JDK R22 compressor to be extremely musical-sounding and great for *firming up* individual tracks. Bass guitar can be difficult to process, especially when the original part is none too evenly played, but this compressor makes a great job of keeping the dynamics under control without

The audio I/O is presented on balanced jacks and XLRs, but there's no external side-chain input.

compromising the natural character of the sound. I think the main strength of this design is its ability to make parts sound more even and better controlled, but without the sound of the compression being obvious and getting in the way of the end result. When you push it harder, especially in hard-knee mode, the results are more obviously processed but still remain musical, and I'm sure that the automatic time constants help to achieve this.

By the same token, this is probably not the compressor to choose if you want to create really obvious gain-pumping effects. Of course, you can hear the compressor doing its thing if you set a high ratio and a low threshold — but I get the impression that the auto attack and release is always doing its best to keep the sound natural. Perhaps that's why the JDK R22 seems to be such a good all-rounder, rather than being a go-to compressor for a single, specific task.

The R22 puts in a great performance, and at the price I can find very little to say that's negative, other than that some users may wish it had a side-chain input or external keying. The results stand comparison with those from some of the most expensive and esoteric compressors on the market — and yet it is very attractively priced, very well engineered and looks the part too. SOS