

Electronic Musician, June 2001 PreSonus VXP



By Myles Boisen

In the race to capture a share of your gear budget, many manufacturers have recently rolled out flashy, high-powered, channel-strip-style processors oriented toward vocal recording. The most stripped-down hybrid voice processors offer a single microphone preamp, a compressor, and an equalizer; as you move up the scale, the units typically provide better components and more features.

Among budget voice processors that cost less than \$1,000, what you typically pay for is a single, proven feature - for example, a good preamp or an acclaimed compressor - with a mixed bag of mediocre extras thrown in. The single-channel PreSonus VXP breaks the budget mold by offering a bountiful selection of high-quality, genuinely useful processing stages, starting with a mic preamp that gives the top contenders a run for their money.

STRING OF TOOLS

With its thick cool blue aluminum front panel and brushed aluminum knobs, the VXP matches the look of the company's MP20 stereo mic preamp. The front panel is divided into six segments according to function and has a big glowing "red eye" push-button power switch on the far right.

From left, first up is the mic preamp section, which provides a continuously variable gain knob with 0 to 60 dB of gain marked in 10 dB steps. Next is the proprietary IDSS control, which ranges from 0 to 100 percent. According to PreSonus, the IDSS control allows for manual adjustment of the drain current on the input FET amplifier, thus increasing even harmonic distortion as IDSS processing is added. That unusual circuit modification is not intended to produce overload distortion associated with guitar amps and fuzz boxes but rather to emulate the thickening effect of even-order harmonic boosting in vacuum tubes.

Just above the gain and IDSS controls is a green eight-segment LED that indicates preamp gain levels at -28, -14, -9, -3, 0, +3, +9, and +18 dB, with a red LED assigned to the +18 dB value. There is no polarity-reverse switch, but 48V phantom

power and a 20 dB attenuation pad are selectable from plastic push-button switches that glow green when engaged.

The VXP's compressor portion traces its lineage to PreSonus' popular Blue Max Smart Compressor. But unlike the Blue Max, which offers 15 presets and a manual setting that allows for control over conventional parameters (ratio, attack time, release time, and so on), the VXP's compressor provides only 16 presets: 5 Light, 5 Medium, and 6 Heavy. The presets are maximized for vocal applications, but according to PreSonus, they are useful in other applications as well. The manual doesn't disclose the individual presets' exact parameters, but it does give ratio ranges for the three groupings - Light 1.1:1 to 1.5:1, Medium 1.6:1 to 2:1, and Heavy 2.5:1 to 8:1 - as well as general applications.

The compressor's input and output (make-up) gain controls are located on a concentric, dual-pot control. By letting the signal level's adjustment be above or below a preset threshold (determined by the compressor preset), the input-gain knob functions essentially as a threshold control - a rather important point the manual fails to mention. Input gain can vary from -12 dB to +18 dB; make-up gain is adjustable from -20 dB to +20 dB. A backlit In/Out switch (bypass) allows for A/B comparison of compressed and uncompressed signals. An eight-segment meter with green LEDs indicates gain reduction at -1, -2, -3, -4, -6, -9, -12, and -18 dB.

A downward expander - designed for smooth, tapered fades of background noise - is simple but surprisingly effective with just two controls on one concentric shaft. The outer threshold ring adjusts the signal level at which the expander starts to work, covering the entire dynamic range of most audio between its extremes of "off" (-70 dBu) and maximum of +20 dB. PreSonus thoughtfully gave the expander a ratio control, which allows continuous manipulation of gated signals' gain reduction, from a subtle 1:1 setting to the complete muting offered by an infinity:1 ratio. LED metering is provided at four gain-reduction points: -3, -6, -12, and -24 dB.

A dual-function concentric knob also controls the de-esser. The inner shaft selects frequency (continuously variable from 800 Hz to 8 kHz) and is targeted at prominent or overly sibilant esses common in many vocal recordings. The de-esser's threshold setting (-40 dB to +20 dB or "off") reduces gain only at the offending frequency and typically passes bass and midrange frequencies untouched so that the de-essed signal loses its sizzle but not its strength. A four-section meter - with green LEDs at -1, -3, -6, and -12 dB - indicates the module's frequency-specific gain reduction. The de-esser and expander sections do not provide a bypass, but they can be disabled by setting their respective threshold controls to the clearly marked "off" positions (counterclockwise for the expander, clockwise for the de-esser).

The VXP's 4-band equalization is implemented as separate high and low shelving (fixed frequency at 100 Hz and 12 kHz respectively, -12 to +12 dB gain on both) and

two concentric, semiparametric midrange controls. The low midrange knob covers three octaves from 90 to 700 Hz, and the high midrange pot spans 450 Hz (marked as .45 kHz) to 5.8 kHz. Bandwidth for each midrange EQ is selectable with a push-button switch, offering Q values of 2.0 or 0.5. A switchable 80 Hz low-cut filter is included, and the EQ section can be bypassed through an In button.

The VXP's master section comprises a peak-limiter threshold control (brickwall type, 0 to +24 dBu or "off"), a master-level control (-70 to +10 dBu), and an output meter identical to the eight-segment LED array in the mic preamp section. No meter indicates gain reduction for the peak limiter.

GOOD CONNECTIONS

The VXP's rear-panel connections are simple: one balanced XLR microphone input, separate $\frac{1}{4}$ -inch balanced TRS send-and-receive insert jacks, and XLR and $\frac{1}{4}$ -inch output jacks for balanced or unbalanced operation, respectively. The insert return can bring a line-level signal into the VXP for processing, and the send jack can also be used when clean output (that is, without channel-strip processing) from the mic preamp is desired. (The manual doesn't mention where the insert return point is in the VXP circuit, but through testing I determined that it comes after the mic preamp and before the compressor and subsequent options.) The line-input level also shows up on the mic preamp input-level meter.

There is no provision for -10 dBV consumer-level output, though the master gain control could easily be used to reduce gain to a level appropriate for -10 input devices. A standard IEC power connector and AC voltage selector are on the rear panel, as is a bay for the optional VXP2496 digital-output converter and card module (\$399).

CARD-CARRYING MEMBER

I tested two VXPs: one with the digital card packaged separately and one with the card already in place. The output card is a stereo converter, meaning that you need to buy only one card to record digitally from a pair of VXPs. Just the same, I wanted to try my hand at installing the VXP2496 in the stock unit. The module was in place in less than ten minutes, and the only difficulty I had was getting some screws out, thanks to the VXP's solid construction.

VXP Specifications

Inputs (1) balanced XLR (mic); (2) balanced/unbalanced $\frac{1}{4}$ " TRS (send and receive)

Outputs (1) balanced XLR; (1) balanced/unbalanced $\frac{1}{4}$ " TRS

Power Supply internal

Dimensions 1U 5 7" (D)

Weight 8 lbs.

MIC PREAMP

Frequency Response 10 Hz-50 kHz
THD + Noise (0% IDSS) <0.003%
THD + Noise (100% IDSS) >0.5%
Noise Floor -97.2 dBu (@ +12 dB gain)
Dynamic Range >115 dB
Headroom +24 dBu
Maximum Gain 36 dB (+12 to + 48 dB)
Attenuation Pad 20 dB (switchable)
Phantom Power 48V

COMPRESSOR

Input Attenuation/Gain -12 to +18 dB
Output Attenuation/Gain -20 to +20 dB
Presets 16

EXPANDER

Threshold Range -70 to +20 dBu
Ratio Range 1:1 to ∞:1

DE-ESSER

Threshold Range -40 to +20 dBu
Frequency Range 800 Hz to 8 kHz

EQUALIZER

Rumble Filter Cutoff Frequency 80 Hz (-6 dB per octave)
Low Shelving 100 Hz (±12 dB)
Low Midrange 90 Hz-700 Hz (±12 dB)
Low-Mid Q (Bandwidth) 0.5/2.0 octave (switchable)
High Midrange 450 Hz-5.8 kHz (±12 dB)
High-Mid Q (Bandwidth) 0.5/2.0 octave (switchable)
High Shelving 12 kHz (±12 dB)

MASTER

Peak Limit Range 0 to +24 dBu
Output Fader -70 to +10 dB

The VXP2496 is truly a marvel of miniaturization. It provides AES/EBU and S/PDIF output jacks, BNC word-clock In and Out, a 1/4-inch TRS right-channel analog in, an internal/external sync LED, and separate bit-rate and sampling-frequency selector switches. Green LEDs indicate selected bit rates of 16, 18, 20, and 24, in addition to all common sampling frequencies (44.1, 48, 88.2, and 96 kHz). All that, two PC boards, and a Crystal Semiconductor 5396 converter chip are mounted on a 1.5-by-4.5-inch panel that attaches to the VXP chassis with two Phillips screws. The

VXPD2496 comes with a three-page manual, which includes installation instructions, brief operating notes, and specifications.

When using two VXPs in tandem, the unit housing the VXPD2496 module is automatically assigned to the left digital channel and the other VXP (or any other preamp, for that matter) must be connected to the TRS right-channel analog input on the converter card. The converter could also be used on a line-level stereo mix by applying the left and right mix-bus outputs to the insert-return jacks of two VXPs.

HOLDS ITS OWN

I put the VXP to work right out of the box for a guitar-tracking session. With the exception of the IDSS circuit, every control and connection point was easy to comprehend without my cracking the manual. The unit weighed more than I expected, partly because of the massive Italian-made toroidal transformer visible through the top vents. On a Fender guitar/Fender amp rig, miked with a Royer R-121 ribbon microphone, the VXP issued a solid, authoritative tone that matched a previous track recorded with the same mic through a Drawmer 1960, one of my favorite guitar preamps.

A female vocalist sounded deliciously airy through a BLUE Bottle microphone (with B7 capsule) paired with the VXP. For her lead vocal and background tracks, I used some limiting and low-shelving EQ to polish the signal going to tape, along with the expander to minimize headphone bleed. The modules were responsive and easy to use. However, I probably dialed in conservative settings because of the EQ section's lack of gain markings and metering for the limiter. In that regard, as with many other preamps I've used, the VXP is more an intuitive rather than an exacting unit. Although I'm happy to rely on my ears when adjusting a knob, having calibrated markings on the VXP's parameters would be nice.

I also compared the VXP to a Neve 1272 preamp on an acoustic-guitar lead miked with an Oktava MK 219 condenser mic. The VXP didn't have the up-front attitude of the vintage Neve, but it certainly held its own. It even added some heft to the tone picked up by the rather bright MK 219. I was consistently impressed by the VXP's ability to stand in for much more expensive preamps during the testing phase. Although I generally avoid dynamic processing and equalization going to tape, most of the VXP's processing options met or surpassed my expectations in terms of professional sound quality, low noise, and absence of coloration. My only gripe is about some of the sections' physical implementation - specifically, the concentric pots required to fit everything onto the VXP's crowded 1U faceplate.

Gain controls for the shelving and bell EQ are detented at their zero settings, but curiously, the compressor and master-gain knobs are not. On the compressor, even with perfect visual alignment of the input and output knob settings at zero, engaging

the module on below-threshold signals changed the overall level and introduced switching noise.

In addition, the 16 compression presets are not labeled, which complicates repeatability. If it were my unit, I'd be tempted to mark the 16 positions with a grease pencil, for example, L1, L2, L3, and so on.

With compressor gain at unity, a 0 dB line input produced an average of -1 dB gain reduction in Light programs, -2 to -3 dB in Medium, and -3 to -6 dB in Heavy. Light to Medium compression could be relied on for good results, with no negative impact on a variety of signals. But at -6 dB in the Heavy settings, the VXP compressor started to pump audibly and it imparted a sibilant edge to a full-spectrum music mix.

The relatively simple de-esser and expander functions are useful and perform on par with the best-available modules found in other multi-effects dynamics processors. The de-esser is easy to fine-tune, but the lack of a bypass switch makes A/B comparisons awkward. Considerable finesse is required to twist the outer ring, which controls threshold, to the off position without accidentally moving the inner knob, which selects the de-ess frequency. Furthermore, that dial's only intermediate numerical value is a zero marking at about two o'clock, which again complicates repeatability. Similarly, the expander controls have no intermediate marks except for a 2:1 ratio designation.

FULL STEAM AHEAD

The VXP's 4-band equalizer - a first on any PreSonus product - is also quite effective and remarkably lavish, especially considering the unit's price. Although there was no special magic in the high-shelf range, the low-shelving control let me make beefy bass boosts without adding unwanted flab to a mix. In addition, the high Q option provided enough surgical precision to reveal previously unheard mixing and mastering flaws in some of my older recordings. Thankfully, all EQ knobs are zero-detented and there are helpful frequency markings around the perimeter of the split-shaft bell EQ controls.

Lack of gain-reduction metering aside, the PreSonus limiter sounds amazingly good under all conditions. During sessions it was always subtle and completely transparent, putting a soft touch on peaks without any coloration or grit. Even when I cranked it to the extreme, I noticed no distortion in a full-music mix. Judging by the VXP's output meter and metering on the DAT, the limiter's gain ceiling is not the inflexible type found on most brickwall-type limiters. What the VXP lacks in control-knob precision, it gains in intelligent designs that sound good.

The VXP's only disappointing feature is the IDSS control. In loudspeaker and session tests, I heard no favorable coloration added by that circuit. At 50 percent, the process is audible, serving to take a little edge off a signal - as would a deep-cut,

high-shelving EQ set to a corner frequency of 2 kHz. At 100 percent, it significantly dulled and attenuated a full-music mix and produced a thick-and muddy-sounding midbass boost that pushed the kick drum forward. Granted, that circuit is probably not intended for stereo-program material; but even on individual tracks, the IDSS produced no audible enhancements.

NOT QUITE CONVERTED

During a loudspeaker test for compatibility and sonic character of the VXPs through the onboard converter card, matching the units' output levels using knob calibrations and the LEDs was easy. Because the preamp gains are continuously adjustable, minor tweaks to the left-right balance were a cinch. For stereo recording to digital media, the VXPs provided dramatic headroom, given that output levels ranging from 0 to +3 dB produced maximum levels on my Tascam DA-30 meters.

I also compared the inexpensive VXP2496 to the A/D on the Apogee PSX-100, a much higher-end converter. For that test, I recorded music samples to DAT through the VXP2496, followed by the same samples with identical preamp settings through the PSX-100. With the Apogee converter as the only variable in the signal chain, the level to DAT dropped dramatically. It didn't take long to figure out why - the VXP2496 was simply calibrated to a much higher reference level than usual. PreSonus explained that the latest revision of its A/D converter card was adjusted to conform to the standard reference level of 0 dB equals -18 dBFS. PreSonus sent me an upgraded VXP2496, and it performed as promised. But with either VXP2496 version, the unit's +24 dB of headroom is sufficient to drive analog or digital inputs to maximum levels, regardless of the converter or reference level used.

With levels equalized through the PreSonus and Apogee converters, samples from Steely Dan's "Green Earrings" revealed intriguing differences. Tonally, though the snare drum was edgier through the VXP digital card, the two converters sounded close to identical when recording the same program at maximum levels to 48 kHz/16-bit DAT. The major discrepancy was in the reverb on Donald Fagen's voice. The reverb was lush through the Apogee PSX-100, and it always sustained through the breaks between vocal lines. The same section when heard through the PreSonus converter, however, sounded like a much drier mix. The reverb decay was shorter and didn't bridge the gap between lyrics.

That result suggests potential resolution problems in the onboard VXP converter. The higher bit rates in the VXP2496 will improve the unit's resolution, but based on my comparison tests, I would be wary of using the PreSonus converter for professional classical recording and other critical stereo-recording applications that require accurate room-sound reproduction and subtle ambient details.

MANUAL OVERDRIVE

The VXP manual, though adequate and well intentioned, unfortunately suffers from omissions and errors. Aside from the lack of specifics about the compression presets and use of the compressor input-gain control, the manual mistakenly groups condenser and ribbon mics, stating that "condenser and some ribbon microphones require external power to preamplify the microphone acoustic pickup. These microphones typically have much higher output than dynamic microphones." Not only do ribbon mics typically produce lower output than ordinary dynamic microphones but they're also actually dynamic mics. Furthermore, phantom power should not be applied to ribbon microphones.

The manual also makes the highly debatable assertion that "the -20 dB pad is almost always necessary when close-miking." I especially took issue with the following statement about the IDSS circuit: "This remarkable effect gives you the sound of a tube without the headache of uneven performance often encountered with vacuum tube devices."

HEADS UP

The PreSonus VXP is a powerful, high-quality voice processor with loads of features yet a surprisingly modest price tag. It provides a Class A mic preamp, an IDSS circuit said to emulate tube distortion, a smart compressor with 16 presets, an expander, a de-esser, a 4-band semiparametric equalizer, and a peak limiter. All the processing stages but one, the IDSS circuit, are well implemented, useful, and highly usable. I was impressed with the VXP's mic preamp, which provides as much or more clean gain than many top-dollar units. At microphone or line level, there is plenty of headroom for analog or digital output (the latter for using the optional VXP2496 converter card). I was also impressed with both the flexibility and transparency of the VXP's peak limiter. Personal-studio operators and picky professionals should note the VXP's competitive sound quality.

To pack such a dense array of features into the VXP's single-rackspace control surface, PreSonus used concentric dual-function pots in the dynamic and EQ processing sections. The face is still a bit cluttered, meaning you have limited finger space and calibration marks are sometimes sparse and hard to decipher. To fit in all the marks, meters, and switches I'd like to see, the VXP would have to be a bigger beast with a larger price tag. As it is, the drawbacks are minor compared with the wealth of high-performance circuitry PreSonus squeezed into an affordable package.

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RATING PRODUCTS FROM 1 TO 5

FEATURES 4.0
AUDIO QUALITY 4.5
EASE OF USE 4.0
VALUE 5.0

PROS: Many fully professional features at a budget price. Excellent mic preamp with lots of gain. Ample +24 dB headroom. Very useful compressor, de-esser, expander, and equalization functions. Excellent limiter circuit. Insert allows send and return and line-level input. Single VXP2496 converter card works for stereo signals.

CONS: Compression presets offer limited options. Some processing sections don't have bypasses for A/B comparison. Not all gain pots are detented. No meter for limiter. No polarity reverse. IDSS effect produces no audible enhancement. VXP2496 converter card doesn't convey low-resolution details well.

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