

# Emotiva XSP-1/XPA-DR2

With a claimed 550W on tap, this US-made pre/power amplifier combo offers serious quantities of sound per pound. How does this muscle amp-on-a-budget perform?  
 Review: Nick Tate Lab: Paul Miller

It's often said that less can actually be more. For example, many high-end hi-fi products are devoid of fripperies because the lion's share of the build budget is spent on the bits you can't see, such as high quality components. This in turn gives better sound per pound, or so the theory goes. Yet other designs come festooned with features and often lack ability in the sonic stakes.

Tennessee-based Emotiva is an avowedly 'budget audiophile' brand that says you can have your cake and eat it, so to speak. Its mission is to give customers lots of metal for their money, plus serious sound too. Founder and CEO Dan Laufman started the company back in 2005 with the express intention of bringing value to the hi-fi market, having already made a successful career for himself as an OEM electronics manufacturer [see boxout, p37].

## POWER PACKS

This new third generation XSP-1 preamp (£1419) and matching XPA-DR2 power amplifier (£1750) are the embodiment of this. Big, muscular-looking and loaded with features, the combo packs a serious amount of power. The XSP-1 preamp is the heart of the system, and with this you can choose between three versions of the XPA power amplifier. In addition to the XPA-DR2 stereo version tested here, there's the DR1 monoblock (£1300) and the DR3 three-channel variant (£2150). All are iterations of the same product, with more 'Differential Reference' amplifier modules slotted into the internal bays as appropriate [see PM's boxout, p35].

Starting with the XSP-1 Differential Reference preamplifier, this has a fully differential, all-analogue signal path and makes extensive use of surface-mount components. In addition to its four RCA line inputs and two balanced XLR ins, there's

**RIGHT:** Space is hardly at a premium inside the XSP-1 but this all-analogue preamp employs surface-mount components throughout, visible in the balanced output stage [below Jade logo]. Stepwise volume control is digitally governed

also an MM/MC phono stage. Instead of an old school volume pot, there is a digitally-controlled resistor ladder network that promises superior channel matching. Done this way, loudspeaker and headphone volume settings are independent, and remembered when the amplifier is powered down. There's also an option to limit the maximum level at turn-on, which might just save your loudspeakers one day! All inputs are switched using relays with silver-plated contacts.

The so-called 'LF and HF trim' facility, better known to the rest of us as tone controls, are also adjusted digitally (but are not digital) on the front panel using the Boost and Cut buttons on the bottom left hand part of the fascia. These offer a subtle  $\pm 3\text{dB}$  trim below 200Hz and above 4kHz. Analogue bass management is offered,

with a choice of full range output or separate high frequency and low frequency outputs, with independently configurable crossover points.

Meanwhile, Home Theatre Bypass, Processor Loop and source Direct buttons are also provided alongside a Dim button for the large, centrally mounted vacuum fluorescent display.

'There's also a monoblock and three-channel DR3 amplifier'

Under this can be found a row of input switches, and to the right a large volume control, with a mute button. All fascia buttons are ringed by blue backlights when the power is on, the outer

ring of the power button switching to amber when the unit drops into standby.

The XPA-DR2 is a no-frills stereo power amplifier rated at a not inconsiderable 550W/8ohm and 800W/4ohm [see PM's Lab Report, p39]. It sports a pressed steel



**LEFT:** The Emotiva XSP-1/XPA-DR2 fascias are big and brash with backlit controls and a large central preamp display. Small buttons cater for input selection and bass/treble tone control, plus there's a rotary for volume. Fit and finish is very good for the money

case with a great many cooling vents on top, and a well-finished satin-black brushed aluminium fascia making it a cosmetic match for its preamplifier brother.

## MODS FOR ROCKERS

As per the XSP-1 preamp, the main on/standby switch is centrally mounted and encircled by a blue LED ring when powered up. Round the back, there are two pairs of loudspeaker binding posts which are quite widely spaced, so you'll need to ensure that

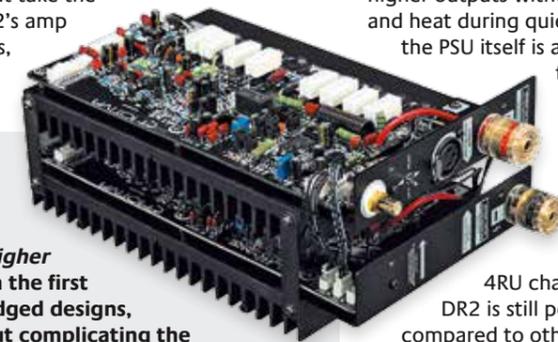
the two feeds in each of your cables aren't crimped too close together. In addition to this, each channel has its own unbalanced RCA input and balanced XLR, with a small switch to select between them. Master power, remote trigger sockets and a reset button complete the picture.

The rear panel also hosts the row of bays that take the XPA-DR2's amp modules, three

of which are blanked off on this particular model. The balanced/bridged modules described by PM in his boxout [below] effectively occupy two bays each, which explains why the 'DR' version of the amp is available up to three channels only.

The modules utilise a multi-rail power supply that steps up to accommodate higher outputs without wasting energy and heat during quieter passages. Even the PSU itself is a switch-mode design,

taking up less space and being far lighter than a traditional linear supply that would need to use a huge toroidal transformer. All this sits on a heavy steel 4RU chassis, though the XPA-DR2 is still perfectly manageable compared to other 500-watters!



## BUILDING BRIDGES

From an amplifier's perspective, driving low impedance (4 or 2ohm) loads means supplying sufficient current to maintain the voltage across the load, while delivering very high power into higher (8ohm) loads is more about supplying the volts in the first place. This is why most 500W+ amplifiers are bridged designs, doubling the amplifier's voltage envelope without complicating the PSU infrastructure. Emotiva's amplifier modules [inset picture] feature two matched cards per channel, each mounted on its own heatsink with four pairs of power transistors running off  $\pm 60\text{V}$  rails. Each pair of cards forms a single balanced/bridged amplifier module (per channel) with a maximum 120V swing.

There's a further twist to the tale here, for without resorting to a Class D technology Emotiva has still achieved cool-running efficiency by blending a Class AB output stage with a Class H stepped-rail PSU architecture on each amplifier card. This switches up to a higher voltage PSU rail only when signal conditions demand it, minimising waste heat. It's not dissimilar to the 'Achromatic Audio Amplifier' used in Benchmark's AHB2 power amp [HFN Mar '15]. Like the AHB2, the XPA-DR2 also features a similarly compact and efficient switch-mode PSU, albeit rated at a rather more substantial 3kW in this far beefier amplifier. PM

## NO FRILLS

The XSP-1 preamplifier performed very well across all inputs. The majority of my listening was done via the XSP-1's balanced line inputs courtesy of a dCS Debussy DAC [HFN Dec '10] playing from a range of digital sources. Yet it has a surprisingly good phono stage too, as a vinyl copy of Grant Green's 'Alone Together' [Green Street; Blue Note BN 4071] illustrated.

This classic jazz track showed it to be low in noise, smooth in tone, dynamically





**ABOVE:** Inside the XPA-DR2's chassis a 3kW switch-mode PSU [far right] services a pair of Emotiva's Class AB/H 'Differential Reference' modules [centre left]. This chassis can accommodate up to three amplifier modules, becoming the £2150 XPA-DR3, with all three channels running off the same PSU

articulate and flowing in rhythm – so not a radical departure from the line inputs. And although this isn't the world's most transparent preamplifier, there's a basic rightness to its sound that makes it easy to enjoy whatever's going on.

### RHYTHMIC GRIP

As a well-matched combo, the XSP-1/XPA-DR2 does what's needed to get the job done with no fuss, garnish or sepia tinting of the music. It gives a clean, tidy, ordered and detailed rendition of the recording, in a pleasing matter-of-fact style. There's power aplenty, decent rhythmic flow and great dynamic headroom. Considering its modest price, you can't fail to be impressed by its sheer all-round ability.

Its capacious soundstage is immediately apparent. Cerrone's 'Supernature' [*Supernature*; Big Break Records CDBBR 0089] is a classic dance track from the late '70s and is extremely well recorded for its era. An ambient, spacious affair, via serious systems it throws out a panoramic stereo soundscape, inside which you can marvel at the powerful percussion work and thick, meaty analogue synthesiser sounds.

The XSP-1/XPA-DR2 carried all this very well, giving the sort of scale to the proceedings that you'd normally expect

from a far pricier pre/power combo. The architectural structure of the recording was clearly discernible, complete with a good degree of depth and accurately placed instruments within the mix. The lead vocal line was held between the speakers with great confidence, too.

This works together with another distinctive trait of these amps – their clean rendition of tone and timbre. Music sounds neutral, with no airbrushing of the treble, or steroid-enhanced bass, and so Cerrone's backing vocals were evenly carried without any excess waffle or warmth.

With the more clinical-sounding early '80s indie rock track, 'Wonderful Woman' by The Smiths

[WEA YZ0001CD1] the Emotiva duo didn't gild the lily, but still let me enjoy the inherent quality of the recording. Morrissey's voice was immediate, up close and well described from a textural point of view, with a directness and honesty that's usually the province of far pricier products.

Despite its lack of warmth, this duo didn't sound unappealing. This is due to its admirable rhythmic grip – it's ability to get to the heart of the music and convey its essential musicality. With The Smiths' track the XSP-1/XPA-DR2 gave a real sense of three young, but highly accomplished, musicians playing together as a tight unit. ➔

*'You can't fail to be impressed by its sheer all-round ability'*

### DAN LAUFMAN

'I had been designing and building a wide variety of audio products as an OEM supplier for many years,' says Dan Laufman, President and CEO of Emotiva. 'My vision was for a company that would design, manufacture and sell high-end electronics at affordable prices into a sales channel that would not compete with our clients at that time. These were sold through the then new Internet!

'Many said it wouldn't work, but I believed in the power of direct sales at real-world prices. Our prices are directly correlated to the actual cost to build, with a consistent but modest profit applied to every model sold. The sale price isn't adjusted to what we think the market is willing to pay...'

He adds that 'Hi-fi is sometimes ridiculously over-priced, and this shuts out enthusiasts willing to invest in audio gear but not at the sacrifice of paying for food and shelter. It's important to make our products available to the widest possible audience if the market is to grow beyond a narrow, ageing group of audiophiles'.

'Cost-conscious consumers are Emotiva's best customers,' Dan says. 'Over half our company's revenue comes from products designed and built in Franklin, Tennessee while some, like our speakers, are manufactured in China. We'd like to make everything at home, but in some cases it simply isn't practical. However, as an engineering-focused company, Emotiva certainly *designs* virtually all its products from the ground up in the USA.'



# LAB REPORT

## EMOTIVA XSP-1/XPA-DR2



**ABOVE:** The preamp [top] offers six line inputs (four on RCA, two balanced on XLR), one MM/MC phono input, a processor/tape loop, L/R/Sub HT inputs and outputs, plus main outs (RCA and XLR). The power amp [below] has single-ended (RCA) and balanced (XLR) inputs with fully floating (ungrounded) speaker outputs

I heard the same pattern with 'Is There Anybody Out There?' by Bassheads [Deconstruction CDR 6303]. Recorded ten or so years later, this is a house music classic and sports a powerful synthesised bassline over which layers of electronic instruments are added. It's a surprisingly high quality recording considering its era and genre, and with the Emotiva duo it spread its wings and flew.

Most important was the interplay between the bass synth, bass drum, snares and hi-hats – these were all so incisively controlled that they might as well have been in a vice. As the fast, danceable beat shuffled along, these amps really brought out the rhythmic nuances of the drum programming, and set my feet tapping. The result was frenetic fun, but with an unerring sense of poise.

The XPA-DR2's sheer power was never in doubt. It took all the speakers I had to hand – some quite difficult loads – and shook them around the room like a dog with an old rag doll. It seemed not in the least bit

**LEFT:** Emotiva's IR handset governs the XSP-1's input and processor/tape loop selection, volume, LF/HF trims and direct mode



fazed pushing powerful, bass-driven music to very high levels. The classic rock standard that is Led Zeppelin's 'Stairway To Heaven' [IV; Atlantic 82638-2] was a mighty test of its mettle. The opening few minutes are relatively quiet and subtle in timing, while the latter couple serves up wonderful pounding rock histrionics.

### FIRECRACKER DYNAMICS

Any serious amp needs to be able to do both of these well, yet budget designs seldom do. The XSP-1/XPA-DR2 delivered a good degree of emotional delicacy at the start, and served up firecracker dynamics at the end, with copious amounts of tight, sinewy bass rocking the rafters. It was at ease in either situation, relishing the opportunity to flex its muscles by thumping out high sound levels with grace. ☺

### HI-FI NEWS VERDICT

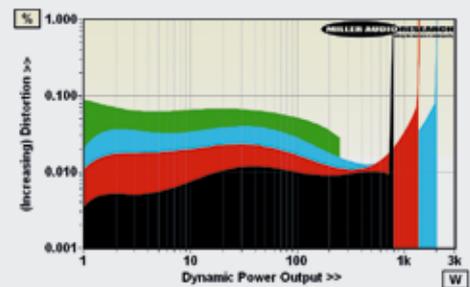
For less than the price of many modern 'super integrateds', Emotiva's XSP-1/XPA-DR2 is a fully featured pre/power amplifier combination with enough watts to power a nightclub, plus good build, a fair selection of useful features and – best of all – strong sound quality. It may lack the aesthetic airs and graces of some rivals, and not have all the latest connectivity options, but its value is very hard to argue with.

Sound Quality: 85%

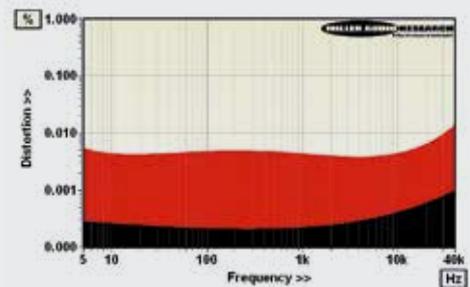


The XSP-1 preamp may look 'busy' but at heart it's a very clean design. Gain is about  $-0.7\text{dB}$  less than specification at  $+11.35\text{dB}$  (balanced in/out) and the volume scale shifted accordingly (so '0.0dB' is  $-0.7\text{dB}$ , etc) but the  $0.5\text{dB}$  increments are accurate. Noise is very low and the A-wtd S/N very wide at  $101.7\text{dB}$  (re.  $0\text{dBV}$ ) while the response, in bypass mode, is flat to within  $\pm 0.3\text{dB}$  from  $2\text{Hz}$ - $100\text{kHz}$ . Distortion is very low at  $0.00018$ - $0.0005\%$  ( $20\text{Hz}$ - $20\text{kHz}$ , re.  $0\text{dBV}$ ) and some  $10\times$  lower than that offered by the partnering XPA-DR2 power amp at  $0.004$ - $0.006\%$  [black vs. red traces, Graph 2 below]. The XSP-1 is good for a full  $11\text{V}$  maximum balanced output but the source impedance is arguably a little high at  $910$ - $950\text{ohm}$  ( $20\text{Hz}$ - $20\text{kHz}$ ).

With its own claim to fame, Emotiva's 'Differential Reference' XPA power amp offers exceptional watt-per-pound (dollar) value. Rated at  $550\text{W}/8\text{ohm}$  and  $800\text{W}/4\text{ohm}$ , in practice the XPA-DR2 delivers  $2\times 650\text{W}$  and  $2\times 1.02\text{kW}$  into  $8/4\text{ohm}$ , the shared switch mode PSU maintaining an increased  $765\text{W}$  and  $1.27\text{kW}$  into  $8/4\text{ohm}$  (one channel driven) and  $800\text{W}$ ,  $1.38\text{kW}$  to  $2.06\text{kW}$  into  $8$ ,  $4$  and  $2\text{ohm}$  loads under dynamic conditions [see Graph 1, below]. Because the XPA-DR2 is a bridged design its amplifier modules 'see' half the real load impedance, hence it is protected at  $255\text{W}/1\text{ohm}$  [which it 'sees' as  $0.5\text{ohm}$  – green trace Graph 1]. Into  $8\text{ohm}$  loads, distortion is well managed at  $0.004\%/1\text{W}$  to  $0.007\%/10\text{W}$  and  $0.008\%/100\text{W}$  before falling back to  $0.004\%$  at higher power prior to clipping (distortion is also very consistent across the  $20\text{Hz}$ - $20\text{kHz}$  audio range). Noise is exceptionally low and the A-wtd S/N wide at  $94.5\text{dB}$  (re.  $0\text{dBW}$ ) while the response rolls gently away at HF to  $-0.4\text{dB}/20\text{kHz}$  and  $-5.1\text{dB}/100\text{kHz}$ . PM



**ABOVE:** Dynamic power output versus distortion into  $8\text{ohm}$  (black trace),  $4\text{ohm}$  (red),  $2\text{ohm}$  (blue) and  $1\text{ohm}$  (green) speaker loads. Max. current is  $32.1\text{A}$



**ABOVE:** THD vs. extended freq for XSP-1 pre ( $1\text{V}$  out, black trace) vs. XPA-DR2 amplifier ( $10\text{W}/8\text{ohm}$ , red)

### HI-FI NEWS SPECIFICATIONS

Continuous power ( $<1\%$ THD, $8/4\text{ohm}$ )	$650\text{W} / 1.02\text{kW}$
Dynamic power ( $<1\%$ THD, $8/4/2/1\text{ohm}$ )	$800\text{W} / 1.38\text{kW} / 2.06\text{kW} / 255\text{W}$
Output imp. ( $20\text{Hz}$ - $20\text{kHz}$ , pre/power)	$945\text{ohm} / 0.032$ - $0.070\text{ohm}$
Freq. resp. ( $20\text{Hz}$ - $100\text{kHz}$ , pre/power)	$+0.0$ to $-0.27\text{dB} / +0.0$ to $-5.1\text{dB}$
Input sensitivity (for $0\text{dBV}/0\text{dBW}$ )	$270\text{mV}$ (pre) / $90\text{mV}$ (power)
A-wtd S/N ratio (re. $0\text{dBV}/0\text{dBW}$ )	$101.7\text{dB}$ (pre) / $94.5\text{dB}$ (power)
Distortion ( $20\text{Hz}$ - $20\text{kHz}$ , $1\text{V}/10\text{W}$ )	$0.0002$ - $0.0005\%/0.0038$ - $0.006\%$
Power consump. (pre/idle/rated o/p)	$21\text{W} / 40\text{W}/1700\text{W}$
Dimensions (WHD, Pre/Power)	$432\times 152\times 419/432\times 203\times 483\text{mm}$