

# HIFI & NEWS

JUNE 1988

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£1.40

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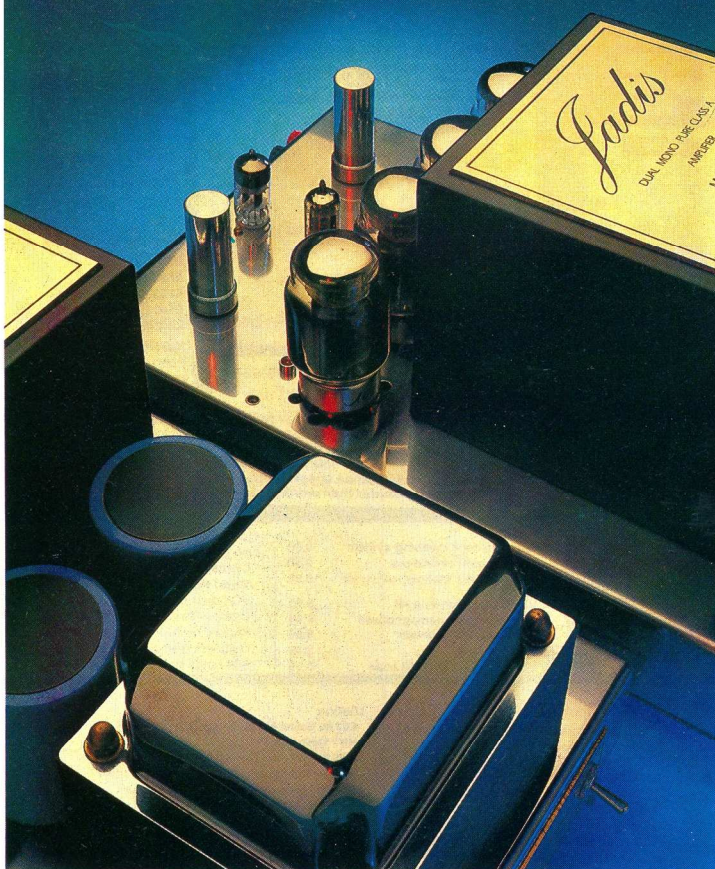
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# JADIS SUPREME

Martin Colloms reviews the Jadis JA80 monoblock valve power amplifiers

**M**Y LAST EXPERIENCE of a Jadis power amplifier concerned the JA200 – a generously rated monster which at that time (1986) suffered from a weak heart. It could play music superbly, but could sometimes undergo catastrophic breakdown. The situation is said to be improving, but I have no up-to-date information. The smaller models – the JA80 and JA30 – do not appear to suffer from such problems, while Jadis have become something of a legend and enjoy a worldwide reputation in audiophile circles for exceptional musicality and a natural sound.

Jadis only design with valves, and have no qualms about using as many as are required for the output stage. Thus the  $2 \times 160\text{W}$  rated JA200 stereo system has a total of twenty GEC KT88s, where  $2 \times 200\text{W}$  is possible in practice from just eight of these, if run in their maximum power mode. Similarly, the  $2 \times 60\text{W}$  JA80 – the subject of this month's review – uses eight KT88s where four output valves could have been made to deliver the same power. This says something for the conservative design philosophy of the company, which is evident throughout their product range.

A matching preamplifier is also available, the JP80, which comprises a two-box unit that requires an external step-up for lower-output moving-coil cartridges. It is rumoured that it offers a performance commensurate with that of the Jadis power amplifiers. The last product in this range is the smaller JA30, built largely in the same manner as the bigger models, but using a total of four KT88 output valves to produce  $2 \times 30\text{W}$  Class-A into 8 ohms.

## Technical details

With each channel rated at a minimum of 60W Class-A at 8 ohms, the power-supply is rated to ensure that result, and with normal mains each channel draws a continuous 242W. A huge output transformer is fitted, that would be good for 200W or more in any other design and which Jadis say does not saturate until 650W(!) of mid-band power is reached. Consequently, Jadis can claim full power delivery down to 15Hz, and in normal use there is no danger of reaching the output transformer operating limits. It is the sheer size of the output and mains transformers which makes the JA80 so heavy – 35kg each unit.

Tracing through the circuit, the input signal is direct-coupled via a 470k film potentiometer which allows the user to preset the gain to a maximum sensitivity of 600mV – suitable for direct connection of a number of sources, including CD. The first stage consists of a

differential amplifier using the two triode sections of an ECC 82. The second grid is grounded, while overall feedback from the speaker terminals goes in the normal manner to the cathode connection of the input section. The bi-phase outputs from the first anodes are direct-coupled to the grids of the next stage, this employing the lower-current ECC83. It is more usual to place this valve in the first stage and follow with the ECC82, where a larger voltage swing is useful to drive the output stage. Jadis have their own proprietary reasons for the decision. A small feedback loop runs from the output cathode connections to a resistive divider, placed between grid and anode of the driver stage, and this may help to improve its otherwise sluggish HF delivery. The '83 driver stage is coupled to the output valve grids by capacitors claimed to be the only ones lying in the signal-path:  $0.47\mu\text{F}$  1600V top-quality polypropylene types.

In fact some additional capacitors are present – for example the electrolytic bypasses present in the cathode circuit of the differential driver stage. But it could be argued that by their very presence these remove that bit of circuit from the signal-path! The output stage comprises four KT88s per channel operating in pure Class-A, push-pull transformer-coupled in a feedback connected variation of the ultra-linear configuration. The output stage is self-biased, this simple technique being based on the use of pre-aged and precision-matched tubes. With Class-A operation the supply current variations are very small, and no regulators are needed for HT feeds to the earlier stages, simple R-C decoupling serving well here.

A small printed-circuit is used, mainly as a terminal board for the power supplies, the solid-state LED bias indicator circuits, and the output transformer terminals. The transformer secondaries may be arranged in three modes, either as supplied for 4-12ohms, or alternatively for 2-6ohms and 8-24ohms, these options accommodating typical loudspeaker load variations. The active circuitry is hard-wired in single-strand conductors, and the shortest possible signal paths are employed, this technique helping to maintain clarity. This amplifier is made to a high standard and is clearly craftsman built; the components used all reflect a long development process aimed at maximising the sound quality. It is also strongly made, using a welded chassis of stainless steel.

For the testing, our usual lab procedure was followed on the 4-8ohm transformer taps – impedance changing is a soldering job here. The finest available sources were used for auditioning; Goldmund Studio



ST4 turntable, a Koetsu Red Signature cartridge, the Cambridge CD1 player, a Musical Fidelity MVX preamp with normalised line-stage input impedance, bi-wired SL700 and B&W 1800 speakers.

### Sound quality

With first-rate amplifiers such as the JA80, the fine standard of sound quality is obvious from the outset, while prolonged listening allows for some subtlety of analysis, cross-checking and comparing, as well as a more leisurely appreciation of the overall performance. Clearly a major reference in its own right, the JA80 must have been way ahead of the field when it was first launched several years ago. Even now, its performance over the broadest mid-range can only be described as eminently musical (by broad mid-range I mean everything from the upper bass to the mid treble). It has a real beauty of tonal rendering coupled with fine inner dynamics, achieved without any exaggeration of drive or presentation. The mid-range was liquid, exceptionally relaxed, yet reproduced with first-rate transient and exceptional definition. Sounds such as open plucked strings and small drums were especially telling. Coupled with a high resolution of detail and an excellent separation of individual sounds and instruments, the JA80 presented a feeling of assured imperturbability, perhaps a function of the Class-A design and its generous build.

If its mid-range is state-of-the-art, then its bass and treble performance was also very nearly so. The bass quality, as rightfully claimed by Jadis, was better than a number of highly regarded solid-state references, and in my experience only the top Krells would show a clear advantage. The bass was articulate, tonally pure and well differentiated, lacking only a modicum of slam and extension at the lowest frequencies. In the treble, the JA80 also set a strong pace. Treble sounds were faithful to the original; bells and triangles were beautifully airy and shimmered with the right degree of brilliance. A minor failing concerned the trace of excess sibilance heard on the more forward of vocal recordings, accompanied by a mild breathiness or glaze audible in the extreme treble range. However, I recall the JA200 as showing even more of this, beginning at a lower frequency.

Stereo focus was in the top class, perhaps not the very best but certainly in same class as the Audio Research M300, which speaks much for the JA80. Stage-width was excellent, and it also proved particularly adept at the portrayal of orchestral perspectives. Musicians were nicely ranked into the depth dimension of the sound-stage. Depth and transparency were both undoubtedly very good, but here the current-series M300 takes the honours with its truly excellent rendition of depth, ambience and distant musical detail. The JA80's staging and depth was, in fact, wholly convincing until reference was made to the M300, when one discovered that more depth and rear stage-width were retrievable from familiar recordings.

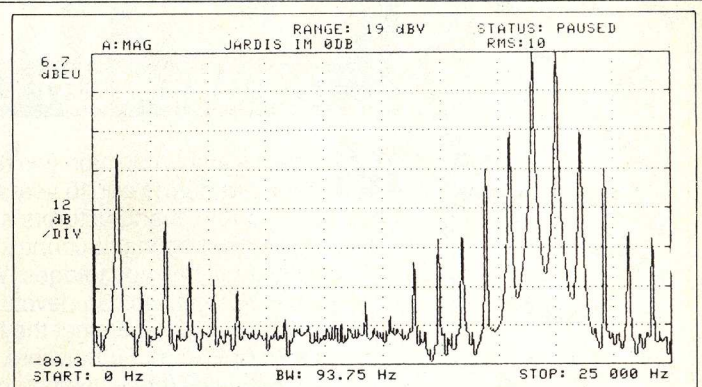
Ultimately, the JA80 was satisfying because its whole performance was so well proportioned and because its exceptional accuracy over the broad mid-range counted for so much in the listening experience. It worked in such a natural and relaxed manner that much of the competition sounds artificial and contrived. Regarding dynamics, they seemed to be just right, adjusted to the musical score and orchestral performance. It was free from any synthetic or exaggerated effects. Rated at 60W, this amplifier raised quite generous sound levels even into low-sensitivity 84dB/W 8-ohm speakers, subjectively seeming like 100-120W of effective controlled power. The rated power is little guide to loudness, and the exact clipping point was hard to pick out.

### Lab report

For many readers the lab test-results presented below will come as something of a shock. Given that the JA80 is seen as one of the world's highest ranked power amplifiers, the lab performance was pretty poor. In truth, these were some of the worst figures I have ever obtained for a valve/tube power amplifier. However, I will immediately forestall the subjectivist's argument that measurements do not mean anything with the question: 'How much better might it sound if the obvious technical weaknesses were properly addressed?'

The rated power is 60W (17.8dBW), but the most that could be raised at 1kHz on an 8-ohm load with 243V UK mains was 16.54dBW, or less than 50W. At 20Hz the output for 1% distortion was satisfactory at 15.52dBW or 34W, but by 20kHz the power output for our distortion criteria had fallen to 2.6dBW – just under two watts! Higher output powers were possible at high frequencies, but at the expense of increased distortion of between 1 and 10%. It did not prove very load-tolerant in power terms, the output falling to 14dBW mid-band on 4 ohms – an equivalent of 50W.

The music-related burst outputs were unexceptional, which was not surprising in view of the weak peak-current delivery of ±4 amps – although with a Class-A circuit the tone-burst and continuous powers will not differ appreciably. Harmonic distortion figures were inaccessible for the rated power, since it was in overload at this point.



Graph 1. Jadis JA80: Intermodulation spuriae from 19/20kHz tones at 30W (just below clipping)

However, at 40W the 1kHz 8-ohm result was -47dB or 0.45%, with those at 20Hz and 20kHz unprintable. By the time modest music levels had been reached at 1W (0dBW), matters had improved to a fine -64dB at 20Hz, with -71dB at 1kHz (0.03%) and a satisfactory -44dB at 20kHz. At 30W or so, HF intermodulation with 19/20kHz tones was unimpressive at -31dB, or about 3% (Graph 1) but, at the 0dBW level distortion improved to -43dB for the 1kHz different-tone. At full power, 1kHz (45W) the spectrogram was not inspiring, showing a range of harmonics of broad extent and indicative of current overload in the driver stages. At just a few watts, the spectrum for 20kHz was still pretty rough.

The speaker terminal output impedance was satisfactory at 0.38ohms; but this is higher than usual for modern designs, and sufficient to alter sound quality to some degree according to speaker load variations – especially with a speaker whose impedance dips right down to 4ohms. Noise levels were fine, while the input impedance was very high at 450k-ohms, allied to an input sensitivity of 0.62V for full output or 93mV for one watt (0dBW). At moderate power the frequency response was very wide, from 0.6Hz to 29kHz for -0.5dB, with the -3dB rolloffs at 0.4Hz and 67kHz.

### Conclusion

Despite prior experience with the poor lab performance of the Jadis JA200, figures for the JA80 still came as something of a shock. Its fine sound belied the lab measurements and confounds the simplistic interpretations which are often given to such data. Clearly designed by ear, the JA80 was a great success in subjective terms in spite of poor technical performance.

If sound quality, build and status are important, then the the costly JA80 must be taken seriously. However, it must be said that in context the equally expensive and similar sounding Audio Research M300 would appear to be a bargain offering, as it gives a good lab performance plus a genuine 300W+ per channel. I am led to wonder how the JA80 will evolve, and whether attention to the serious technical weaknesses exposed here will result in a still better subjective result. Only time will tell. Meanwhile, those fortunate few with JA80s can sit back and enjoy its unrivalled musicality on classical music sources. ●

TEST RESULTS	JADIS JA80	POWER AMPLIFIER	
Rated power	60W	(17.8dB.W)*, 8ohms	
Measured power at 240V (dB.W*)	20Hz	1kHz	
Continuous 8ohms, 1ch	13.52	16.54	2.6
Continuous 4ohms, both	13.8	14.0	0.72
Burst 10mS 8ohms		17.0	
	4ohms	15.0	
	2ohms	12.0	
Output impedance	0.38	0.38	0.33
Harmonic Distortion (dB)			
at 40ohms/8ohms	-	-47	-
at 0dB.W/8ohms	-64	-71	-44
Channel separation			mono construction
Intermodulation 19kHz/20kHz:			
1:1 (rated power/0dB.W)			-31dB/-43dB
Peak current via 1ohm, 2.2µF			+4A, -4A
Signal/noise 22Hz-22kHz (dB)	0dB.W	full level	
	-80dB	-97dB	
Input impedance			450k-ohms
Input sensitivity, IHF, 0.dB.W/clip			93mV/0.615V
DC offset, L/R			0mV
Frequency response, -3dB points			0.4Hz - 67kHz
Protection			none required
Supply modulation			good
Typical price inc VAT			£3625 each mono unit

\*where 0dB.W=2.83V (1W into 8ohms)

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