



# Radio Activity

**The 845 valve makes glorious music in hi-fi applications. And Noel Keywood feels this, the new Icon Audio MB845 MkII 'David Shaw Signature' power amplifier, is its finest hour...**

**J**ust two years after I reviewed Icon Audio's lovely MB845 valve power amplifier in our January 09 issue, there's a MkII version. In important areas the original design has been radically upgraded. But the upgrade isn't just physical: where the original MB845 power amplifier was an audiophile bargain at £2,500 per pair (at the time) the new one has been 'repositioned' as a high-end power amplifier and priced accordingly; it now costs £4999.95 in standard form.

Phew! That's some price increase. But we have run the original alongside a Musical Fidelity AMS50 transistor amplifier – price £8,900 – for a year and it often prevailed, as in a recent review of Tannoy's Definition DC10T loudspeaker for example. The new version is a stunningly good amplifier, and easily able to justify its

new price alongside the competition, but at the same time it moves out of reach for many potential buyers I suspect; this is a pity...

Why would anyone consider paying such money for these monoblock valve amplifiers? Easy! The most obvious reason is visual: the 845 glows brightest of all valves. It's a veritable lighthouse and with the amplifiers on, no one is going to miss them. Friends will gasp and onlookers be impressed in a way that eludes all other amplifiers, bar a smattering of boutique rivals. This directly heated triode, with its thoriated tungsten filament, is a monster from 1931 that proclaims its presence and power with a vivid orange glow from a large glass envelope. The MB845 MkII is a big chassis that provides an appropriate industrial backdrop for it. Together they are an impressive sight.

The other reason to get one is

sound quality, as perhaps you might hope! Appearance in this case doesn't deceive. The MB845 MkII is a big hitter of a valve amplifier whose appearance perfectly speaks its ability.

If all this looks very retro, a relic from the steam age with the same sort of puff, let me explain. It is retro, but brought up to date to exploit the relaxed, full bodied yet easy going sound of valves that were designed for audio use. Unlike transistors, designed for general industrial use, possessing inadequacies for audio amplification covered over with an electronic sticking plaster called feedback, the big 845s possess no intrinsic weaknesses as far as audio amplification is concerned. Their drawbacks are the obvious ones of size, weight and heat. An emerging 20th century radio industry soon demanded smaller size and power consumption so valves like this

were quickly superseded, but sound quality didn't benefit from miniaturisation. That's why this amplifier also uses the early, large bulb 6SN7 and 6SL7 triodes. They sound better – smoother, more relaxed and fluid than later, smaller 1950s B7G and B9A based valves. And if you spotted that the two 6SL7s have charred black glass envelopes that make them look like burnt out seconds, they are in fact new, top quality 'Treasure Series' Shuguangs from China. The black staining comes from improved gettering, a process that eliminates gas residues after evacuation of the bulb.

Yep. This amplifier may look retro but every valve in it is a new variant of an old design, using best quality modern materials and construction techniques. Designer David Shaw told me he tried the latest metal anode Shuguang 845s (845C) that have higher power handling but preferred the graphite anode originals, albeit in improved 845B form as fitted to our amplifier. This doesn't surprise me in the least. A sonic feature of the 845 is the characteristically dark, damped sound of its graphite anode, a quality many listeners remark upon.

So the MB845 MkII is not what it seems to the casual eye. It is in truth a highly tuned up, modern variant of a classic valve amplifier, using materials and even techniques neither affordable or even available when such valves first came into use 80 years ago. It is also unlike other modern valve amplifiers based on later 1950s valves like the KT88. The big, old triodes are pigs to use because they demand high voltages and this multiplies component costs all round, but they sound wonderful, and an added bonus is that supply is good and costs not exorbitant (unlike the 300B for example).

Valve enthusiasts may by this point be wondering why our amp had Treasure Series valves in the first place. It's because it was a David Shaw Signature tuned variant that costs £5,999.95. It lacks the Signature badge, because it had not arrived from the badge manufacturer! But it did not lack the higher quality valves or Jensen paper-in-oil, copper foil coupling capacitors...

When we fitted Jensens to World Audio Design amplifiers back in the early 1990s they had a big impact on the sound and my WAD 300B uses them, so I know their sonic footprint. An amp fitted with Jensens isn't gong to sound like anything commercially available though and it's useful to bear this in mind with regard to this amplifier's sound quality.

Whatever component you

look at in an amplifier like this, it is radically different to most else on the market. Every component is optimised for audio use and much of what is used, especially the custom designed and built output transformers, are horribly expensive. So you'd expect it to sound different – and believe me it does! This is no cooking transistor amplifier.

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The new amplifier is an altogether larger beast than the old one. Most noticeable is a new weight of 37kgs, up from 23kgs of the original. Where the old amplifier was an awkward lift, being close to the HSE recommended safe maximum of 25kgs, the new one is nearly impossible to lift and even difficult to move. It isn't just weight and price that have gone up though. Icon Audio have knowingly increased power to the 100 Watt figure many listeners believe they need.

To deliver this amount of power with valves you need a serious output transformer if it is to stay clean right up to maximum power and this is the main reason weight has increased so much. The new output transformer is a monster, but because of it the amplifier now delivers an easy 100 Watts of bass power without core saturation and the soggy bass that results. The old one, I noted, became unhappy much above 65 Watts at bass frequencies, so Icon Audio have not only rectified this weakness but upped the maximum power output as well. As a result the new MB845 is a really heavy hitter; it's a muscle amplifier with a sound to match. It isn't out of puff at 100 Watts, where the old one was struggling much past 65 Watts so there's a big difference between them.

Higher power output from a single pair of 845 valves demands a more serious power supply so the mains transformer has grown substantially too. The H.T. is frightening 1250 Volts and uses diode rectification plus choke smoothing. Driving an 845 is no easy task; often a 300B valve is used but this is a ridiculously expensive solution. Designer David Shaw has instead used two 6SN7 double triodes, each strapped as a single, one per phase, each choke loaded for maximum

voltage swing. The three chokes are now housed in their own screening cans on top of the chassis and you can see them as three smaller units sitting alongside the giant mains and output transformers.

The front end paraphase splitter is a 6SL7 and it provides gain too. Running as recommended in low sensitivity mode, input sensitivity is a

normal 1V for full output. Icon Audio continue with their unusual sensitivity switch that in its Up position turns feedback off (enough to make a transistor amplifier designer swoon!). Using this switch alters everything, not just sensitivity, and if this was a transistor amplifier its performance would collapse if you did this.

Not so with valves, however. Designed a long, long time ago for audio (and radio) amplification the 845 works well without feedback and differences are less than any classically trained audio engineer would expect. Gain and therefore sensitivity rocket up, but bandwidth narrows and both distortion and output impedance increase. But not by great amounts and certainly not to any easily appreciable subjective degree either, which is perhaps the bigger surprise.

My World Audio Design 300B push-pull amplifier has a feedback switch. The biggest subjective change is bass quality, which noticeably softens when feedback is switched off due to increased output impedance imposing less electrical damping upon the loudspeaker.

This, and a slight cleaning of the sound, is the reason why Icon Audio recommend feedback is left on. The small amount of feedback used (6dB) perceptibly improves bass control, with little loss elsewhere. In practice, with my amplifier, I've found listeners initially prefer the tidy, tight sound with feedback on,





but end up changing their minds and preferring the more relaxed, organic flow apparent with feedback off.

Whether bass quality remains acceptable depends upon the loudspeaker's own acoustic damping; in some cases less damping sounds better, not worse. So this is not a cut and dried issue.

I found much the same occurred with the MB845 MkII. Switching feedback off changes the sound slightly, but it's no big change within the overall picture and not what you'd expect from the change in measured performance. Icon Audio fit this facility, they say, to provide extra gain so a passive preamplifier can be used. However, all silver disc players deliver 2V nowadays and many other sources manage 1V out so even with feedback on the new MB845 will match just about anything.

The side mounted rocker style power switch has now become a front mounted push button, and bias adjusters and a hum buckler are all top mounted. This is a fixed-bias amplifier which, confusingly, means it must be adjusted! Only occasionally though, every few months at most. Icon Audio supply a small multimeter for the purpose and it's just a quick tweak.

The hum buckler is fitted to minimise hum that is an inevitability with directly heated triodes running from a 50Hz a.c. heater supply, as these do (d.c. lessens heater life). Measurement showed that both monoblocks managed the 1mV hum figure we used as a rule of thumb maximum with World Audio Design amplifiers. So although a slight hum is apparent, it should be inaudible at normal listening distances, unless you are using super sensitive big Tannoy's perhaps. Even then 1mV will not be readily apparent.

The output transformer's secondary winding basically matches 8 Ohms and has a 4 Ohm tap. It's usually best to use the lower 4 Ohm tap and, with this amplifier, although power output was identical (meaning no coupling losses) I was surprised to find distortion was lower from the 4 Ohm output, so this is what I used.

From a usability point of view 845s get hot, but not scolding hot like 6C33Cs for example. Icon supply protective covers, a must if there are small children around.

Our in-house MB845 has been switched on an off endlessly and beaten hard in its year as a review mule, with no ill effects.

In theory, if a valve amp is properly designed it can be switched on and off endlessly without loudspeakers connected and this was a standard test I applied brutally to all World Audio Design amplifiers without ever encountering a problem (it tests insulation layer breakdown in the output trannies, and resistance to back emfs in power supply components). You can also short the output terminals of a valve amplifier for a small time (few seconds) and get away with it, but best not to! Drawing excess current through output tubes overheats the anodes, they warp, short – and there's then a big bang. This can destroy the output transformer. However, the 845's machined graphite anode is unlikely to warp I feel. It is a rugged valve. I'm less caring about a valve amp than a transistor amp and they take it.

For £5,999.95 you don't get swathes of machined alloy and cute fluorescent displays with this amplifier, you don't get clattering relays nor a remote control. It's standard of finish is good; the chassis are all welded and burnished to give smooth edges. An alloy top plate carries screen printed valve types and all lettering and printing meets a high standard, as does the switch gear and rear output terminals; these are gold plated and accept 4mm plugs as well as spades and bare wire.

## SOUND QUALITY

Initially I felt the new MB845 had drier bass than the outgoing model and this is the case. It is less rounded and fulsome, but it now goes deeper than before, carries stupendous weight and provides vivid dynamic swings that are quite extraordinary by everyday audio standards. Watching the cones of our Spondor S8es flap back and forth when playing CD showed deep subsonics were present – and I felt them too. The new MB845 MkII runs very, very deep and there's enormous weight to

its delivery, something that brought real fright to the heavy synth work behind Lady Gaga's 'Bad Romance'.

The lone click of a castanet stood forward on the stage, in well lit relief to the hard pounding of the background bass synth in 'Bad Romance'. When this stopped to give Lady Gaga space to shout and croon into the microphone her voice lanced out centre stage. The way this amplifier mines detail, exhibits a richness of tonal colour and emphasises dynamic inflections was made obvious at the end of the track where the heavy backing suddenly stops to leave Gaga to finish the song in a barren soundscape, to add drama. The Icon stretched every sinew here, giving her a tremendous sense of fleshed out power, a big bodied presence that had her vocals tearing out centre stage.

It was all so fulsome and powerful, yet held under great control, I couldn't help but be amazed by this amplifier. It's gained muscle compared to its predecessor, but in true valve amplifier style it has neither the hardness or mechanical sterility transistors display. With great insight that paints a detailed picture and makes Gaga's amusingly suggestive lyrics so clear they were laid out in 3D in front of me, this was not just a fantastic audio experience but a totally convincing picture of a real person at the microphone. In that sense the amplifier is also deeply communicative and emotionally involving.

It was also a very 'turn it up' experience. The combination of super smooth treble and vast bass, backed by endless reserves of power had me winding up to insane levels at times; 100dB rms and 110dB peaks came up on our Bruel & Kjaer Sound level meter – and that's loud. I was often aware that the outgoing amplifier could suffer a little muddle as volume went up, when driving insensitive loudspeakers. That's not a problem any more. The bigger output transformer and better feedback system have cured this limitation, and it makes the new model subjectively much cleaner at very high listening levels.

I used the Spondors because they are lightly damped and the MB845 MkII gripped them strongly, even if it did not sound as dry as Musical Fidelity's transistor AMS50.

With deep subsonics from Jackie Leven's less synthetically produced 'Extremely Violent Man' I could not help but wonder where the MB845 MkII was actually finding this information. The presence of extended subsonics marks the MkII

out and brings threatening presence to its delivery.

Bass apart, the entire balance of the amplifier has changed. It is now smoother and more cohesive sounding overall. The slight hardening of midrange information that added some extra bite has gone, making for a more svelte delivery, and I was surprised that treble is now gentle in its nature. There's still plenty of treble power but it has been smoothed out and made less obvious, an effect that usefully counterbalances the shout of today's loudspeakers. I suspect also that the lessening of high frequency distortions the new feedback arrangement introduces 'simplifies' the treble, as it were.

Nigel Kennedy's violin was soft and smooth in Max Bruch's Violin Concerto No 1, but also richly detailed and again unusually forceful and expressive, Kennedy's controlled bow work being made delightfully obvious by the fluency with which the amplifier could express dynamic changes. The new amp's seeming softness of high treble gave violin a lovely silky sound. But Jensen paper-in-oils do produce dark inter-transient silences, plus a richly textured midband and no hardness or screech in upper treble. It's all a little different from the norm and not run-of-the-mill. I don't believe I have ever heard the copper foils

(mine are aluminium, I recall) and somewhere this amplifier had a very dark, soft tonality. I was sold on Jensens when I first heard them but they do damp the sound down and ringing, stinging treble disappears – or so it seems. But not always. Jensens are sonically quite obvious and may not suit everyone. But the lustrously rich midband and strong resolution of instrumental timbre, stretched dynamics and clean tempo changes all militate in their favour. Both Kennedy and the London Philharmonic accompanying him gained as much from Icon's talents as other genres. Perhaps more so if hard, edgy and tonally barren violins tire you.

Spinning a track like Steve Earle's 'Esmeralda's Hollywood' with its stinging tambourine challenged my suspicion of softness. Quite the opposite: the tambourine was viciously hissy; it sounded like a bag of angry rattlers. But it was also big and bold on the soundstage and when instead of being hit it was shaken in time with the beat this was forcefully obvious. Then the next track started I nearly jumped out of the settee with the opening drum roll.


The MB845 MkII has a peculiar nature that lulls you into thinking there's no power to treble – then it comes out and hits you! It is highly damped by the Jensens, but at the

same time they seemingly stretch dynamic contrasts, causing sounds to leap out of a darkness free of hash and muddle. And all music is so affected. This is a characteristic of the amplifier that sets it apart.

Just like its predecessor the new amp has extraordinary midrange dynamics that brought a crashing end to Earle's 'This Highway's Mine', where instruments seemed to fall out of the loudspeakers. Great fun, and very heavy Rock wise, mountains of turbo charged power making for a visceral experience.

CONCLUSION

The 845 valve remains a brute of a valve to listen to: it's dramatically powerful sounding, much more so than the relaxed 300B. Icon Audio have wrung much more from it in this MkII David Shaw Signature version of the MB845 power amplifier. It's become an altogether larger experience because everything has gone up, cost, size, weight and power. In effect the amplifier has been repositioned – but what a position! This is one of the most dramatic amplifiers you could wish to hear and can justify any price in some respects. It is a pity it falls out of reach of many, because it's a testament to what a hi-fi amplifier can sound like and is worth hearing by one and all.

**VERDICT**   
Smooth, silky and full bodied yet with enormous dynamics, this muscle amp boasts extraordinary sound quality.

**ICON AUDIO MB845 MKII DS SIGNATURE** £5,999.95  
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**FOR**

- powerful sound
- tremendous insight
- solid imaging
- endlessly deep bass

**AGAINST**

- difficult size and weight
- needs adjustment

MEASURED PERFORMANCE

The MB845 MkII produces 100 Watts exactly (1% THD), from both 8 Ohm and 4 Ohm taps so there's no coupling losses associated with the latter. This is a small increase over its predecessor, tested in our January 09 issue and is a lot of welly from a valve amplifier, but the graphite anodes of the big 845 output valves can handle it easily.

The upper frequency response limit was 27kHz (-1dB) with feedback on (low sensitivity setting) and 20kHz with it off. The amplifier is best used with feedback on, Icon say, input sensitivity then measuring a normal 1V, making a preamp useful but not vital with 2V sources such as CD players. Input sensitivity doubles with feedback off, the amplifier needing just 0.5V to deliver full output.

The lower frequency limit is undefined, the amplifier measuring flat down to 4Hz or so and producing 5W or so output at this frequency. Like many valve amplifiers the MB845 MkII suffers core saturation in the output transformer if asked to deliver anything more than a few Watts at subsonic frequencies (below 10Hz). This may only become a problem when large LP warp signals are flapping the loudspeaker cones. Switching feedback off (High sensitivity) ameliorates the problem.

Like its predecessor the MB845 MkII produces little distortion until high volumes are required. However, what it produces remains largely second harmonic, correlated with the music and this is subjectively benign. The

bigger output transformers allowed the MkIIs to deliver 100 Watts at 40Hz with alacrity however, a big improvement upon the Mk1s and quite an achievement by valve standards. The use of a tertiary feedback winding feeding the 'cathodes' likely helps here too.

Power at high frequencies was, however, less than maximum and I suspect the larger core and winding stack has increased reactance (leakage inductance or inter-layer capacitance). Unusually, the MkII delivered lower distortion figures from its 4 Ohm tap and could still deliver 80 Watts at 10kHz for 3% distortion. Although 3% distortion sounds high it was predominantly second harmonic and again music correlated. In use the amplifier would be unlikely to be pushed to deliver more than 20 Watts or so at 10kHz and at this level distortion was around 0.3% second harmonic. Crossover distortion was completely absent; there were no high order harmonics at all.

Hum buckers are used to keep hum down from the directly heated triodes and at 50Hz measured exactly 1mV, an acceptable upper limit and less than the MkI, the MB845 has been quietened in this area. There's no hiss at -109dB.

Output impedance measured 0.62 Ohms with feedback on, giving a damping factor figure of 6 with 4 Ohm loudspeakers and 12 with 8 Ohm loudspeakers. Switching feedback off increased output impedance to 1.4 Ohms and this will provide little audible loudspeaker

damping.

The new MB845 MkII will have more slam than before and likely sound cleaner at high levels. It remains a heavy slugger, but this is an iron fist in a velvet glove, as distortions have been reduced and the circuit refined in a very effective way. NK

Power	100 Watts
Frequency response	4Hz-27kHz
Noise	-109dB
Distortion	0.12%
Sensitivity	1V
Output impedance	0.62 Ohms

DISTORTION

