Jungson

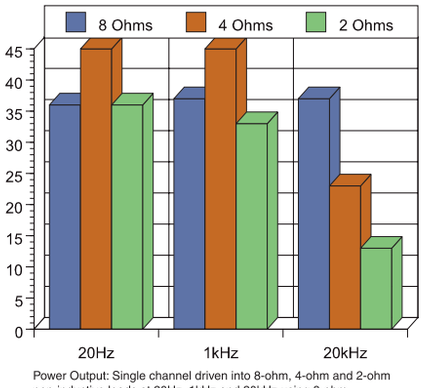
DA-88Ti Integrated Valve Amplifier

Jungson has been manufacturing amplifiers for some time, but I only recently discovered that it's now a so-called 'full-range' manufacturer, offering hi-fi components in all categories. It must be doing well, because its cable division reports that it has now sold so many cables that if they were all laid end-to-end, they'd circle the earth!

The Equipment

Valve amplifiers are heavy. Everyone knows that. But 38kg? When the courier delivered Jungson's DA-88Ti in its unprepossessing wooden crate, I blithely tried to move it with my light-weight aluminium trolley. One buckled trolley later, I determined that my trusty (and rusty) old steel one would have been a better choice.

Opening the crate was also interesting, because it really was like a Chinese puzzle. If it hadn't been for the instructions kindly provided by the affable Minjie Lin, of MFL, who's responsible for importing and distributing Jungson in Australia, I would never have discovered that the two concealed slats underneath the crate needed to be slid out, after which the top of the crate could be neatly lifted off, revealing the amplifier within, nestled within a velveteen protective sleeve.



Power Output: Single channel driven into 8-ohm, 4-ohm and 2-ohm non-inductive loads at 20Hz, 1kHz and 20kHz using 8-ohm transformer tap. [Jungson JA-88Ti]

Jungson very sensibly doesn't ship the DA-88Ti with the valves installed. They're instead provided boxed and in bubble-wrap, enclosed within the amplifier itself, so you need to remove the eight screws at the top to get them out… which is fine, because you'd have had to remove the top anyway to insert the valves. The valve complement is two pairs of KT88s (or 6550s), a pair of 5SN7s and a pair of 6SL7s (or 6H9s). All are clearly marked, which is good because each DA-88Ti is aligned specifically for the valve set provided which means, of course, that you also can't put any old KT88 in any old octal socket. Each valve must go in the same socket it was when the amplifier was tuned at the factory. To this end, the four power valves are marked 'A1, A2, B1, and B2.' The sockets aren't similarly marked: you instead need to depend on paper templates of the valve layout supplied with the amplifier. No fear of losing one of these—no fewer than five identical templates were provided with my review amplifier! As with most valve amplifiers made in China, the JA-88Ti comes with a pair of nice white cotton gloves, so that you can easily avoid getting fingerprints on the valves or on the stainless finish of the front panel. A word to the wise at this point, which is that the gloves will prevent fingerprints, but they also make it quite tricky to pick up the valves single-handed, so remember to use both hands!

I confess that when I first removed the silk sleeve covering the amplifier, I imagined that editor Greg Borrowman had sent me a power amplifier instead of the integrated he'd promised, because that's exactly what the DA-88Ti looks like, as I hope you'll agree after looking at the photo accompanying the review. A quick shufti around the back was all it took to dispel that idea: the numerous gold-plated pairs of RCA sockets immediately betrayed the fact that the DA-88Ti is in fact an integrated valve amplifier. Since I've mentioned them, there are four pairs of RCA inputs in all, plus a pair of three-pin XLR balanced inputs.

The speaker outputs are a little unusual for a valve output stage, because rather than the 4Ω and 6Ω taps sharing a common ground terminal (0), separate ground terminals are provided. And rather than these terminals being located alongside each other or mirror-imaged, all the left-channel outputs are located in the one 'block' at the top of the amplifier's rear panel and all the right-channel outputs are located in another 'block' immediately below it.

Moving back around the front of the amplifier, you'll find that all functions are controlled by push-buttons, which the manual advises you should use by *'when gently pushing'*. There are five buttons in all. The largest, in the centre, is the power switch. To its left are Vol (+) and Vol (–) buttons. To its right is

first a 'Mute' button and then an Input Selector. This last toggles through the five available inputs, leading off with the XLR pair (1).

Despite the front-panel controls, I'm pleased to be able to report that after you've powered the amplifier up, there's no need to go anywhere near it, because Jungson provides a beautiful little hand-crafted wooden remote control that will let you do anything you could do from the front panel from the comfort of your own chair—except for power up/down.

I've already mentioned the weight of this amplifier, so I can round off this section with the dimensions. The amplifier is 397mm wide, 450mm deep and 280mm high. It should not need to be said, but I will: don't even try picking this amplifier on your own! Even two is probably too few!

Listening Sessions

The Jungson DA-88Ti is an object of beauty even when it's switched off, but when it's powered up it turns into a veritable wonderland, thanks to blue LEDs, red valve heaters and the myriad reflective surfaces (some of which, it must be said, are most likely there simply to ensure this little 'light show' is as spectacular as possible).

Regular readers will know that I am a tubaholic (that's the vacuum tubes, not the musical instrument) from 'way back, so I guess I could be accused of being slightly biased towards the DA-88Ti from the outset, but my view is that you can't listen to a valve amplifier without being won over by the sound quality, so most everyone reading a review of a valve amplifier will already be a convert. But if you're not a convert to the tube god, listening to Jungson's DA-88Ti will certainly have you up in the pulpit preaching!

High power output is not a strength of valve amplifiers (there are exceptions, I know, but they're uncommon) and this is certainly true of the Jungson DA-88Ti which is rated at 35-watts per channel. However not only are these 'valve' watts, which always sound louder than solid-state watts, but they're also Class-A watts as well! I should explain that 'louder' reference for those who are not in the know. When a solid-state amplifier exceeds its rated power output, it will sound awful—unlistenable, in fact—immediately. However, when a valve amplifier exceeds its rated power output, distortion will certainly increase, and there may be other sonic effects, but the music will sound just fine. Indeed some people prefer the sound of a valve amp when it's being operated at its overload threshold, because the increase in harmonics gives a richer, warmer sound.

Being the proud new owner/builder of a pair of horn-loaded speakers using Fostex FE208E Sigmas, whose efficiency is 97dB-SPL according to my trusty Altronics Q1264 Sound Pressure Level meter (which I bought after it received a great review in this very magazine!), I quickly discovered the DA-88Ti had more than enough power for me to reach playback levels so high that they were physically uncomfortable. I've always been a fan of single-driver, full-range systems, and after living for several months now with the DA-88Ti I'd recommend this combination to anyone. You won't ever have heard such smooth, chocolate-ey sound or such a gloriously sweet top-end. The audible benefit of there being no crossover in the way of the music to introduce unwanted phase and frequency anomalies is immediately audible, and so too is the speed and immediacy of the super-lightweight paper cone. The Class-A output stage of the DA-88Ti, with its complete lack of crossover distortion means the playback sound is hugely comfortable to your ears, so you just listen and listen. Since the Fostex didn't place any great demands on the low-frequency ability of the Jungson, I also auditioned the JA-88Ti when it was driving a pair of very large four-ways, and was impressed not only by the force and melodiousness of the bass coming from it, but also by the control it exerted over the 15-inch drivers. Switching back to the Fostex horns, I checked out the extreme high-frequency response of the DA-88Ti by switching in the iso-mounted T900A tweeter I have on top for when I'm replaying albums that can use a little extra crispness at the top end that the FE208E's can't quite deliver. The extra load complication (of the tweeters plus the single capacitor x/o) didn't faze the Jungson one iota, with the superb tonal quality continuing exactly as before, save that the higher frequencies became almost ethereal.

So far, I'd personally judge this a glowing review, so it's time to throw a brickbat. The volume stepper control is insufferably slow, to the tune of taking 35 seconds to move from go to whoa or, in more technical terms, from maximum input to minimum, or if you go by the display, from '99' to '0'. This means you'll be using the mute control a lot… which is fine except the mute logic is a little strange, because when the amplifier is muted, pushing any button cancels muting, so you can't, for example, switch from one input to another while the amplifier remains muted. Luckily, the DA-88Ti automatically 'remembers' the last input and the last volume control setting you used, even if the amplifier is switched off, so you'll rarely have to endure the full extent of the slowness of the volume control, because the recalled level will likely be within a few notches of the ideal.

Conclusion

This is yet another great amplifier from Jungson, and yet again has been made available in Australia at a price that makes it a bargain compared to its competitors… especially when you consider the incredible build quality. Some tubaholics might have difficulty coming to grips with the fact that the valves are not external and therefore not 'on display' for all to see, but you can see all the action through the large front window, and the internal lighting tricks will ensure it looks spectacular in any system. *Chris Croft*

- Appearance
- Build quality
- Price

- Weight
- Volume Control
- Muting Operation

Jungson DA-88Ti Integrated Valve Amplifier

Brand: Jungson
Model: DA-88Ti
Category: Integrated Valve Amplifier
RRP: $4,350
Warranty: Three Years
Distributor: MFL Import & Export Company
Address: PO Box 563
Newcastle
NSW 2287
T: (02) 4951 6063
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E: info@mfl-importexport.com.au
W: www.jungson.com.au

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Jungson DA-88Ti Valve Integrated Amplifier should continue on and read the LABORATORY REPORT published on the following pages. All readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

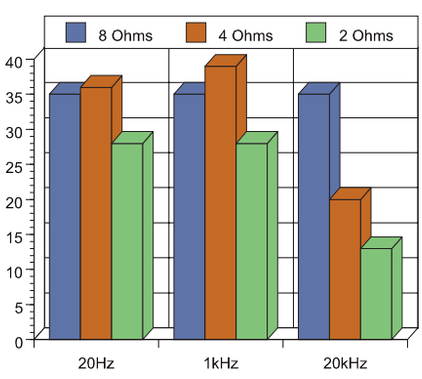
Test Results

Power output was measured for both the 8Ω and 4Ω taps on the DA-88Ti. The complete sets of results are tabulated in the accompanying tables and indicate that you will get by far the best performance from this design if you use speakers that are nominally 8Ω and connect them to the 8Ω tap. I'd also suggest using speakers whose minimum impedance does not dip below 4Ω. Also, needless to say, the speakers you choose should be efficient, because *Newport Test Labs'* performance tests show that the DA-88Ti will deliver only 35-watts per channel into 8Ω and only around 40-watts per channel into 4Ω. As is usual for valve amplifiers, picking the points at which to make the power output measurements is tricky, because the test waveform does not 'square off' neatly as it does with solid-state amplifiers, and so these results represent the point at which THD+N reached 3 per cent.

As for distortion itself, you can see this in Graphs 1 through 4, which show distortion at an output of one-watt across all combinations of load impedances and output transformer taps. Noticeable is the difference in the noise floor between the 8Ω and 4Ω taps, with the 4Ω being around 10dB 'better'—though when the 8Ω floor is sitting at –120dB, the 'improvement' is of no real significance. As you can see, the amplifier's distortion 'signature' is consistent across all the tests, with a fairly significant second harmonic component sitting around –70dB (0.03% THD) and a slightly less prominent third harmonic distortion component at around –80dB (0.01% THD). As you can see, I'm simplifying this a little: distortion is slightly higher for the 4Ω tap than for the 8Ω tap, irrespective of load impedance. However, overall THD+N at one watt was still relatively low for a valve amplifier, with *Newport Test Labs* measuring 0.02%.

The picture changes somewhat at rated output, of course, with odd- and even-order distortion components present at high levels right across the audio spectrum. In practise, it's the lower-order harmonics that have the greatest effect on sound quality. Once again, 8Ω distortion was a little lower than 4Ω distortion, so to simplify a little, I will explain only the 8Ω graph in detail. The first two harmonic distortion components (2nd and 3rd), at 2kHz and 3kHz, are just below and just above (respectively) the –60dB point that is equivalent to 0.1% THD. The fourth and fifth harmonic distortion components both hover just above –80dB (0.01%). The sixth and seventh-order harmonics are at around –85dB (0.005%). The even higher-order components, which stretch out to 20kHz and beyond, are low enough in relation to the distortion that is already present to be ignored. Again, despite the appearance of the graph, the overall cumulative THD+N figure is 0.18%, which is quite respectable.

The frequency response of the Jungson across the audio band was very good, as you can see from *Graph 7*. The black trace shows the frequency response into a standard laboratory load (an 8Ω non-inductive high-power resistor) and you can see that it's just 0.5dB down at 20Hz and 0.22dB high at 20kHz. So the normalised response is 20Hz to 20kHz ±0.38dB. The red trace shows the amplifier's frequency response when it's driving a load representative of a typical two-way loudspeaker load. You can see there's far more variation in level, though I think not sufficient variation as to cause the amplifier to 'sound' different depending on the speakers connected to it—at least not so far as frequency balance is concerned. Into the simulated loudspeaker load, the Jungson's frequency response was measured at 20Hz to 20kHz ±0.45dB. No doubt you've notice the rising response above 20kHz. In fact the Jungson DA-88Ti's frequency response continues to rise in this fashion until it peaks at +4.4dB at 58kHz before rolling off. It's this peaking response that delivers the extended high-frequency response tabulated on the charts, effectively extending the –1dB point to 85kHz and the –3dB point to ➤



Power Output: Both channels driven into 8-ohm, 4-ohm and 2-ohm non-inductive loads at 20Hz, 1kHz and 20kHz using 8-ohm transformer tap. [Jungson JA-88Ti]

Jungson DA-88Ti Valve Integrated Amplifier - Test Results for Power Output Using 4Ω Tap

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8Ω/ 4Ω tap	24	13.8	27	14.3	12.5	11.0
2	8Ω/ 4Ω tap	23	13.6	25	13.9	12.5	11.0
1	4Ω/ 4Ω tap	35	15.4	35	15.4	12	10.8
2	4Ω/ 4Ω tap	35	15.4	35	15.4	12	10.8
1	2Ω/ 4Ω tap	50	17.0	41	16.1	13	11.1
2	2Ω/ 4Ω tap	33	15.2	36	15.5	13	11.1

Note: Figures in the dBW column represent the output level, in decibels, referred to one watt output.

Jungson DA-88Ti Valve Integrated Amplifier - Test Results for Power Output Using 8Ω Tap

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8Ω/ 8Ω tap	36	15.5	37	15.7	37	15.7
2	8Ω/ 8Ω tap	35	15.4	35	15.4	35	15.4
1	4Ω/ 8Ω tap	45	16.5	45	16.5	23	13.6
2	4Ω/ 8Ω tap	36	15.5	39	15.9	20	13.0
1	2Ω/ 8Ω tap	36	15.5	33	15.2	13	11.1
2	2Ω/ 8Ω tap	28	14.5	28	14.5	13	11.1

Note: Figures in the dBW column represent the output level, in decibels, referred to one watt output.

Jungson DA-88Ti Valve Integrated Amplifier - Test Results

Test	Measured Result	Units/Comments
Frequency Response @ 1 watt	3.0Hz–85kHz	–1dB
Frequency Response @ 1 watt	2.0Hz–92kHz	–3dB
Channel Separation	98dB / 96dB / 81dB	(20Hz/1kHz/20kHz)
Channel Balance	0.1dB	@ 1kHz
Interchannel Phase	1.0 / 0.1 / 0.07	deg (20Hz/1k/20k)
THD+N	0.02% / 0.18%	1 watt/rated o/p
S/N Ratio (unweighted/weighted)	81dB/90dB	dB re 1 watt output
S/N Ratio (unweighted/weighted)	93dB/102dB	dB re rated output
Input Sensitivity (CD input)	81mV/495mV	(1 watt/rated output)
Power Consumption	224 watts	On
Power Consumption	228 watts/275 watts	1-watt/Rated O/P
Mains Voltage Variation	235–252 volts	Min–Max

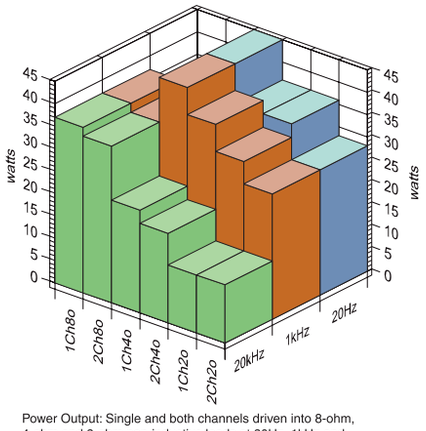
92kHz. The low-frequency extension is particularly good: not too many valve amplifiers can boast a –3dB point at 2Hz!

Channel separation was excellent, as you can see, measuring 98dB at 20Hz, diminishing only slightly to 96dB at 1kHz, then to a still excellent 81dB at 20kHz. Channel balance (0.1dB at 1kHz) and phase responses (see chart) were equally good. The signal-to-noise ratios referenced to 1-watt output appear to be nothing to write home about, but when you consider that the 93dB (unweighted) and 102dB (weighted) figures come off such a low upper power output (35-watts) these S/N figures are actually very good.

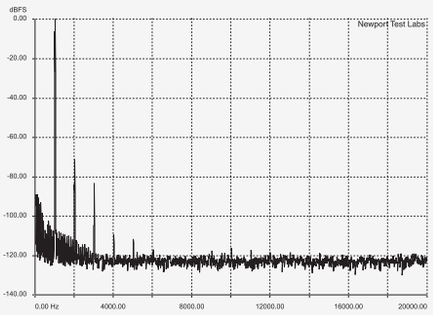
CCIF-IMD is shown in *Graph 8*. The Jungson's performance here proved to be quite 'unvalvelike' with the regenerated 1kHz signal down at –75dB (0.01%) and the 18kHz and 21kHz sidebands down at –70dB (0.03%). Normally, valve amplifiers have much higher levels of 1kHz in their output, as against solid-state amplifiers, which have almost none. So the DA-88Ti falls between the two camps, but definitely veers towards the valve side.

The 100Hz square wave's top shows the tilt that betrays that the frequency response does not extend to d.c., and also a slight curve indicating some low-frequency phase-shift issues. If you look very carefully, you can see some slight overshoot at the leading edge that shows the peaking high-frequency response. This overshoot is made even more visible on the 1kHz oscillogram. However, other than this overshoot, the waveform at 1kHz is excellent. The same can't be said of the 10kHz waveform, though in this case the overshoot caused by the rising frequency response has ameliorated the leading edge rounding one would normally expect to find. Overall though, I'd prefer it if Jungson's designers aimed at eliminating the peak in the response at 58kHz, even if this means rolling off the frequency response slightly at the upper end of the audio band, say between 10kHz and 20kHz. This peak also affected the stability of the amplifier when it was driving highly capacitative loads, so I would not recommend the use of electrostatic speakers with the DA-88Ti.

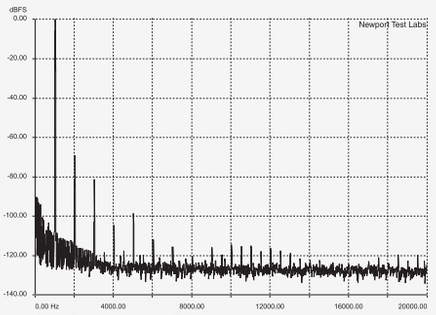
Steve Holding



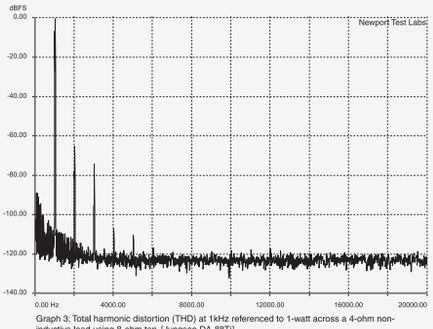
Power Output: Single and both channels driven into 8-ohm, 4-ohm and 2-ohm non-inductive loads at 20Hz, 1kHz and 20kHz using 8-ohm transformer tap. [Jungson JA-88Ti]



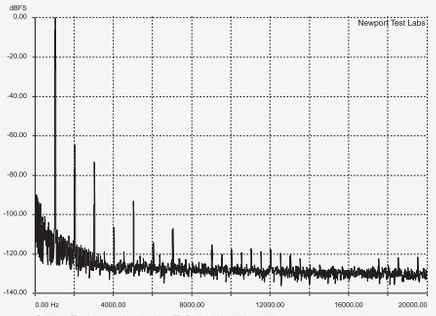
Graph 1: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across an 8-ohm non-inductive load using 8-ohm tap. [Jungson DA-88Ti]



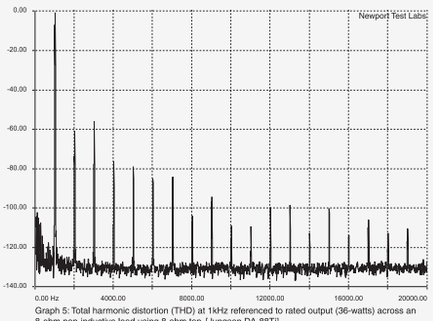
Graph 2: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across an 8-ohm non-inductive load using 4-ohm tap. [Jungson DA-88Ti]



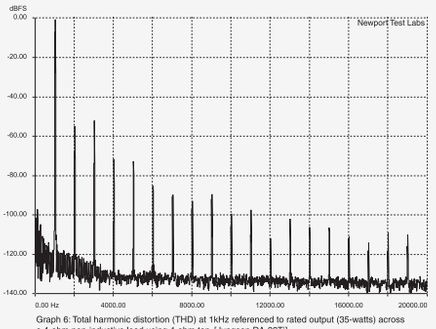
Graph 3: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across a 4-ohm non-inductive load using 8-ohm tap. [Jungson DA-88Ti]



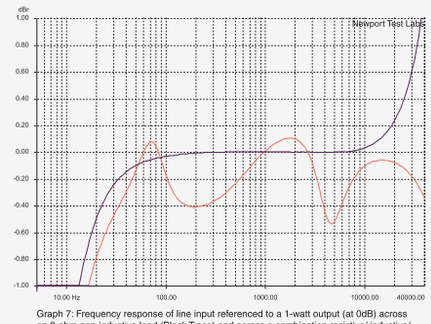
Graph 4: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across a 4-ohm non-inductive load using 4-ohm tap. [Jungson DA-88Ti]



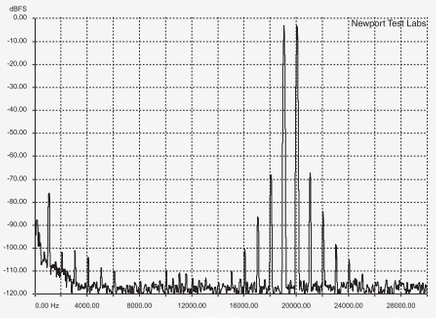
Graph 5: Total harmonic distortion (THD) at 1kHz referenced to rated output (36-watts) across an 8-ohm non-inductive load using 8-ohm tap. [Jungson DA-88Ti]



Graph 6: Total harmonic distortion (THD) at 1kHz referenced to rated output (35-watts) across a 4-ohm non-inductive load using 4-ohm tap. [Jungson DA-88Ti]



Graph 7: Frequency response of line input referenced to a 1-watt output (at 0dB) across an 8-ohm non-inductive load (Black Trace) and across a combination resistive/ inductive/ capacitive load representative of a two-way loudspeaker system (Red Trace). [DA-88Ti]



Graph 8: Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz, referenced to a 1 watt output (at 0dB) across an 8 ohm non-inductive load. [DA-88Ti]