

AUDIA FLIGHT FL THREE S



INTEGRATED AMPLIFIER

This year seemed like a good year to review Audia Flight's FL Three S integrated amplifier, because it's exactly twenty years since this Italian company released its first product, the Flight 100 power amplifier (released 1997) and I wasn't about to wait around until the twentieth anniversary of Audia Flight's first integrated amplifier (the Flight One) because otherwise you would have been waiting until 2021 for this review.

THE EQUIPMENT

With so many manufacturers trying to build in added value to their products these days by offering 'features' that most audiophiles actually don't want (built in DACs, phono amplifiers and suchlike), it was truly refreshing to find that Audia Flight's FL Three S is, at heart, just an integrated amplifier. Sure you can option-in a USB DAC (add \$580), and an MM/MC phono input stage (add \$620) if you want, but they're *options*, not supplied as a '*fait accompli*'. The price for the basic

amplifier is \$4,900. (Both the phono stage and DAC can be retro-fitted if you buy the basic amplifier and change your mind and decide to add one or the other... or both at any point in the future.)

Why do I think that most audiophiles don't want these circuits built in? I reached this conclusion simply from observing the make-up of hundreds of audiophiles' systems over the years. Most vinyl lovers prefer to use a dedicated phono stage, usually one that allows them to correctly load their phono cartridge (for resistance and capacitance) and to adjust the gain.

Similarly, audiophiles trying to extract the best from digital files, whether they're being served up by a silvery disc or from a hard drive, almost always have an external DAC. This mostly gives them options of filter selection, phase switching and so on, and also makes it less expensive to upgrade when some new circuit comes along... or some new format: MQA being the most recent arrival, but from far the first, and here I'm thinking of the many different implementations of DSD, just for starters.

That said, I'd equally observe that there are many music lovers who prefer 'single box solutions', and these are the folks that will love that they can buy a plain Audia Flight FL Three S, or one that's been optioned-up with a USB DAC and a phono stage. One thing you should note, however, is that including a phono stage means losing one of the Flight FL Three S's unbalanced line-level inputs. In standard form, the FL Three S comes with four line-level unbalanced inputs (via RCA), plus a single balanced input (via XLR). Option-in the MM/MC phono stage and this drops down to three unbalanced inputs and one balanced input.

One of the neat features of the Audia Flight FL Three S is that you can assign one of the inputs so that any component connected to it will bypass the preamplifier section to directly drive the internal power amplifiers. This makes it easy to use the FL Three S to integrate your main stereo speakers as the front-left and front-right speakers in a multi-channel home theatre system, but also use them for stereo listening via stereo sources connected to the Flight Three S.

Yet another neat feature is that the 'pre-amplifier outputs' on the rear panel are not ordinary outputs because if you have an external power amplifier connected to these, you can optionally turn off the FL Three S's own internal power amplifiers, which means the entire 'heft' of the FL Three S's power supply can be devoted to 'processing and preamplifying'. Well, not strictly 'supply' but 'supplies' because the FL Three S actually has eight power supplies that are fed by a 500VA toroidal transformer, including high-current stages for the output transistors that are supported by 72,000µF-worth of storage/smoothing capacitance... and that's not counting the additional 13,200µF that's available to the other stages.

I was pleased to find that the Audia Flight FL Three S has a sophisticated electronic protection system built in...

In terms of visual appearance, Audia Flight has come ahead in leaps and bounds in recent years. Look at the chassis of the Audia Flight FL Three (that is, not the 'S' version) and if there were no logo present, you'd be hard-pressed to identify it from any one of a hundred other integrated amplifiers, whereas with the FL Three S, I reckon I could pick one from one hundred metres away! I particularly like the quirky design of the front panel display, which has been formed into a shape that resembles a smiling mouth. It's so distinctive that when I cropped a shot of it and pasted it into Google's 'Image Search' engine, I was expecting it to return thousands of images containing smiling mouths. I was totally surprised when Google simply advised: 'Best guess for this image: audia flight three s' and provided three pages of links to reviews and retail outlets for this model.

The 'smile' on the front panel display is carved into a solid chunk of aluminium alloy that's 10mm thick, and the display itself is a totally modern OLED type with lettering large enough to be clearly visible from quite some distance. Pressing the (+) and (-) input buttons below the display let you cycle through the available inputs with the respective input names (Input 1, Input 2, Input 3 etc) being shown in the display as you cycle through. Not that you're stuck with the default names: the FL Three S allows you to re-name all the inputs to reflect your personal

preferences and/or the names of the specific components you have connected to it. The only limitation is that only ten characters can be displayed, so if you have a component with a particularly long-winded manufacturer's name and/or model number, your skill at abbreviation will be required.

To the right of the input selector buttons is a Speaker On/Off button, a 'Set' button (used in conjunction with input labelling, direct/bypass selection for Input 4, setting monitor function for the record output, checking the loaded software version and resetting all programs back to factory default) and a Mute button.

The infrared remote control provided with the FL Three S is powered by two CR2032

lithium batteries and the controls on it duplicate most of those found on the front panel, plus adds control over the brightness of the front panel display. You can choose to switch this display off entirely, but it will still turn on briefly whenever you press one of the

buttons on the remote or on the front panel. I was pleased to find that the Audia Flight FL Three S has a sophisticated protection system to protect the amplifier in the case of short circuits, excessive current draw at the speaker terminals, excessive heatsink temperature (>80°C), d.c. at the output terminals, supply failure and even in the event that the amplifier detects that its own protection circuit is not operating normally. In the case of a fault, the FL Three S will go into protection mode and show 'Protection' in the front panel display. Reset involves turning the amplifier off completely by removing mains power, then re-establishing power and switching on.

The Audia Flight FL Three S measures 450x110x440mm (WHD), weighs 16.5kg and draws less than 0.5-watts in standby mode.

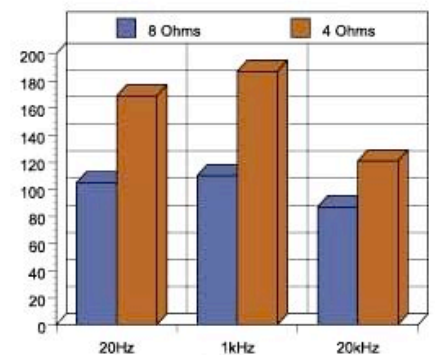
IN USE AND LISTENING SESSIONS

My review sample Audia Flight FL Three S came with the optional phono board installed, and I have to say that it's a truly wonderful unit. In addition to offering support for both moving-magnet and moving-coil cartridges, it also offers (via DIP switches) adjustable capacitance for MM cartridges (50, 100, 150, 200, 300 and 400pF) and adjustable resistance for MC cartridges (20Ω, 30Ω, 70Ω, 100Ω, 250Ω, 330Ω, 1kΩ and 47kΩ). And if none of these resistances is suitable for your

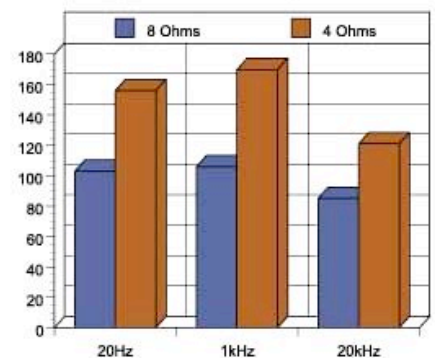
particular cartridge, there's even a space on the PCB for you to insert a resistor to parallel the 47kΩ load to drop it to the specific resistance value required.

I should also make it clear that if you option in the DAC board, you don't lose an input, as you do with the phono stage, but instead gain one, so the USB input becomes Input 6. Audia Flight doesn't publish details about the DAC it's using other than to say that it's a 24-bit 192kHz device that's isolated from your computer by an ADuM from Analog Devices. Says Audia Flight: 'When the USB is used together with a player application such as FooBar or WinAmp, the user can transfer stream music files to [the] internal converter at 192kHz/24-bits maximum frequency/resolution while avoiding undesired PC or MAC audio mixer data processing during the data transfer from hard disk.'

Since I'm clearing things up, I should also make it perfectly clear to readers that the full-sized 6.35mm stereo headphone socket on the front panel of the FL Three S is your access to a fully-fledged discrete high-performance headphone amplifier—it's not just hived off the speaker output or a driven by a cheap IC. It drove all the headphones I had on hand perfectly, so I always had more than adequate volume levels, together with very low noise and distortion. So there's no need for you to invest in a separate headphone



Power Output: Single Channel Driven into 8 ohms and 4 ohms.



Power Output: Both Channels Driven into 8 ohms and 4 ohms.



The optional phono board offers (via DIP switches) adjustable capacitance for MM cartridges (50, 100, 150, 200, 300 and 400pF) and adjustable resistance for MC cartridges (20Ω, 30Ω, 70Ω, 100Ω, 250Ω, 330Ω, 1kΩ and 47kΩ) plus support for custom values.

amplifier... if you were thinking you might need one.

The Owners' Manual provided by Audia Flight says that every FL Three S is pre-conditioned by being run-in at the factory for 50 hours, but goes on to recommend that you should run yours in for a further 100 hours before doing any serious listening, at the same time emphasising that 'running in' means actually running a music signal through it... not merely leaving it 'switched on'.

Since my review Audia Flight FL Three S arrived already optioned-up with a phono input, the very first thing I did was change the front panel display to reflect this, by re-labelling it PHONO. The process of re-labelling proved to be quite a laborious one, because you have to cycle through the alphabet(s) contained in the Audia Flight's memory via repeated button-pressing to assign each letter. Luckily I only had to do five letters rather than ten. And actually, when a phono stage is installed, it should be mandatory for Audia Flight to program the display to Phono at the factory, rather than requiring customers to do it.

Since I have mentioned the buttons on the front panel of the Audia Flight FL Three S I should say that they're very unusual: tiny



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spring-loaded dome-headed buttons that not only click when they're pressed in, but also click when they're released, with the double click almost always accompanied by yet another click from a relay inside the amplifier.

The 'mute' circuit on the Audia Flight FL3S is implemented rather strangely, in that when you press it, the volume control (which is motorised) turns all the way down (which takes about 4 seconds), and it's only after the volume has been ramped all the way down that the word 'Mute' finally shows in the front panel OLED. Press 'Mute' again and the opposite process takes place. If the volume control is already at its minimum position, the mute circuit doesn't work at all. So it's more like a 'wind the volume control back to zero then back to where it was' control than a true 'Mute' button (i.e., one whose circuit is independent of the volume control.)

The 'Speaker On/Speaker Off' function is also implemented rather strangely. Press the 'SPKR OFF' button and after a slight delay, the front panel display shows "SPKR". It may just be me, but this wording seemed counter-intuitive. I'd have preferred the display to read 'SPKR OFF' (which luckily just squeezes in within the 10-character display limitation). The delay in operation is also a tad annoying... even though it's only about one second. Why couldn't it be instantaneous? (And having said that, because the FL Three S is software-controlled, Audia Flight could easily re-write the software for new models, and to upgrade older models, so this may be possible in the future... if enough users think it's desirable.)

During my listening sessions I trialled several different pairs of speakers with the FL Three S and while the amplifier didn't seem to care too much about the efficiency of the speakers it was connected to, driving low-efficiency speakers and high efficiency speakers with equal aplomb to their maximum performance capabilities (and with more than

sufficient volume from even the lowest-efficiency models) the overall 'feel' of the sound from the Audia Flight seemed more relaxed when it was driving speakers with higher impedance ratings—in the 6Ω to 8Ω range.

My listening session started in a very relaxed way, enjoying Diana Krall's newest album, 'Turn Up The Quiet', which should be instantly recognisable to audiophiles because of the McIntosh turntable that features on the album's artwork (with Ms Krall lying languorously alongside it, it must be said.) You know you're in for a musical treat when you hear Christian McBride's bass lazily kicking off the intro track *Like Someone in Love* (Jimmy Van Heusen/Johnny Burke), then you know you're in for a real sonic treat when you hear Krall's slow intake of breath before she sings: '*Lately, I find myself out gazing at stars*'. The Audia Flight FL Three S delivered the sound so naturally, and so realistically, that I literally went limp in my chair with the pleasure of it. '*This is how an amplifier should reproduce music,*' I thought to myself. And it wasn't only the quality of the sound, it was also the timing of her delivery, and the pitching of it. Can you tell all this in less than 22 seconds? The fact that you can simply proves the quality of the Audia Flight FL Three S. The production quality of this album is great, and all the instruments (as well as Krall's voice) are beautifully recorded. If Krall and Tommy Lipuma (who produced it) were aiming at a 'piano bar' sound—and I think they were—they've succeeded big-time. Darken the lights in your listening room and you'll easily be able to imagine yourself in just such a bar, with Krall tickling both the ivories and your fancy.

London Grammar's recent release ('Truth is a Beautiful Thing') reminded me how good an album 'If You Wait' was, so it's been doing some fairly heavy rotation *en mi casa*. Listening to *Wasting My Young Years* had me in admiration at the way they can control




the dynamics of a song, so it doesn't run the way you'd expect. Every time the tempo picks up and you expect a big finish, it merely falls away, pinned only by Reid's plaintive vocal line that closes with the self-fulfilling prophecy 'I don't know what you want, don't leave me hanging on' in a perfectly anticlimactic conclusion that's not a conclusion... yet is. The atmospheric that make *Hey Now* such a compelling listen are beautifully rendered by the Audia Flight FL Three S, and because you can hear so deep into the sonics, you know that the amplifier's noise floor is 'way below that of the music, so it's lower than you'll ever need. The fluidity of the amplifier's delivery is also demonstrated by the continuity and extension of Reid's vocals... does she ever draw breath?

I trialed the Audia Flight Three S's power delivery and dynamics with another disc that's in heavy rotation at my place, simply as a result of me and mine seeing 'Baby Driver' at the cinema. Don't mind if I never see the movie again, but the soundtrack is absolutely fantastic... and this from someone who's not a fan of the soundtrack genre. On paper, the track listing doesn't appear to work—*Unsquare Dance* (Dave Brubeck Quartet) leading into *Neat Neat Neat* (The Damned) as just one example. Turning up the wick on *Bongolia* (The Incredible Bongo Band) showed me I wouldn't be wanting for power if I owned an FL Three S. *Bongolia* is pretty much all percussion, of course—and not only bongos—and even though I turned the volume up as far as I dared, the FL Three S just powered on, delivering the peaks and transients without any signs of compression or premature distortion. I heard exactly the same when listening to the insanity of Focus' *Hocus Pocus*, with its heavy bass lines, screaming guitar leads and the sound of a drum kit being thrashed to death... with all the same effects being repeated a few tracks later by Queen on their *Brighton Rock*... which contrasts rather strangely with the Simon and Garfunkel song from which the movie took its name. (Sky Ferreira's *Easy* separates these two tracks, so maybe not so strange, except for the strangeness of *Easy* itself!) My only disappointment was the producers closing out the album with a song that not only didn't feature in the movie, but also takes the glory

away from what would have been the close-out track, Kid Koala's *Was He Slow?* (which is also a great demo of the FL Three S's capabilities in the power output department.)

CONCLUSION

This beautifully built Italian-made integrated amplifier has all the features and facilities you could want in an integrated amplifier, plus the option to incorporate a (very reasonably-priced) DAC and/or a (very reasonably-priced) MM/MC phono stage any time you want, while sonically it marries the best attributes of valves with the best attributes of solid state to deliver sound quality that will have you smiling with pleasure with every album you play... which is likely why they put the smile on the front panel in the first place.  Aaron Fleming

Readers interested in a full technical appraisal of the performance of the Audia Flight FL Three S Integrated Amplifier should continue on and read the LABORATORY REPORT published on the following pages. 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.

CONTACT DETAILS

Brand: Audia Flight
Model: FL Three S
RRP: \$4,900
Warranty: Two Years
Distributor: Absolute Hi End
Address: PO Box 370
 Ormond VIC 3204
T: (04) 8877 7999
E: info@absolutehiend.com
W: www.absolutehiend.com



- Great sound
- Feature-laden
- Looks superb



- Programming procedure
- Mute Operation

LABORATORY TEST RESULTS

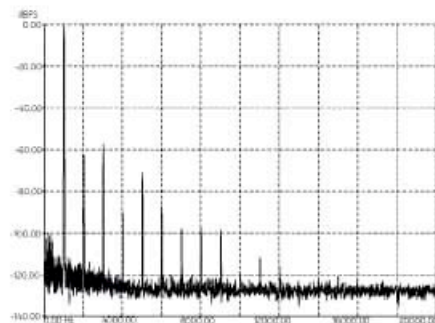
Newport Test Labs tested the power output of the Audia Flight FL Three S using its standard test procedures, which resulted in the nine measurements that are tabulated in the accompanying test result table as well as shown visually in the bar graphs. You can see that the Audia Flight FL Three S easily met its rated output power figures (of 100-watts into 8Ω and 160-watts into 4Ω) at the 20Hz and 1kHz test frequencies, but fell around 0.7dB short at 20kHz when driving 8Ω loads and 1.2dB short at 20kHz when driving 4Ω loads. The slight limitation at this frequency was not due to amplifier clipping, but instead because the waveform distortion exceeded 3.0% THD.

Driven into 8Ω loads at 1kHz, the Audia Flight FL Three S delivered 110-watts per channel with a single channel driven, and 106-watts with both channels driven. Driven into 4Ω loads at 1kHz, the Audia Flight FL Three S delivered 187-watts per channel with a single channel driven and 170-watts with both channels driven. In practise, due to the distribution of power across the audio spectrum when any amplifier is reproducing music, rather than test signals, the Audia Flight FL Three S will always deliver high frequencies at the correct levels, despite not being able to deliver its full rated power at high frequencies with continuous test signals.

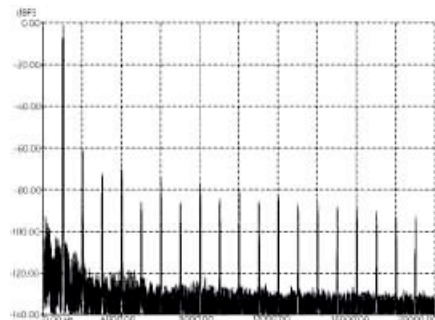
Newport Test Labs usually tests power output into 2Ω loads as well, but in the case of the FL Three S, Audia Flight has built in an output current protection circuit that kicks in slowly (four seconds) if the amplifier is asked to deliver full power into any load of less than 2.5Ω, and quickly if it detects a short circuit. This protection circuit prevented any full-power testing into 2Ω loads, since it takes more than four seconds to make a continuous power output measurement.

Channel separation was an excellent 107dB at low frequencies and still a very good 80dB at 1kHz. The result measured at 20kHz (55dB) is more than sufficient to ensure perfect channel separation and stereo imaging, but I am used to seeing higher figures measured by *Newport*

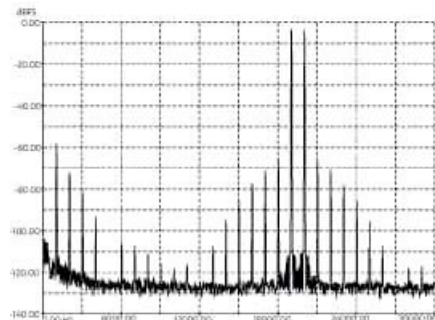
Graph 1. Total harmonic distortion (THD) at 1kHz at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB.



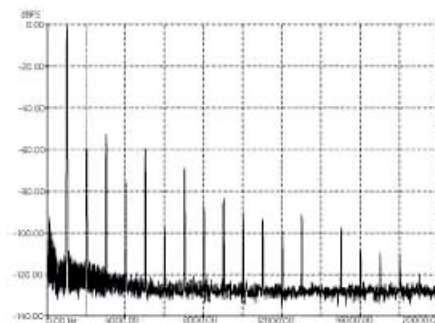
Graph 3. Total harmonic distortion (THD) at 1kHz at rated output (100 watts) into an 8-ohm non-inductive load, referenced to 0dB.



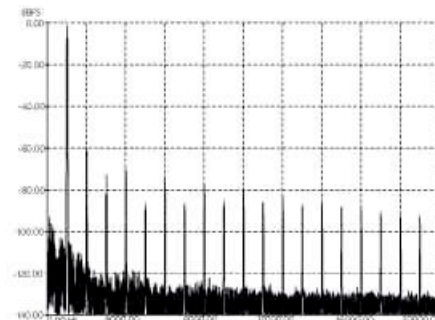
Graph 5. Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz, at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB.



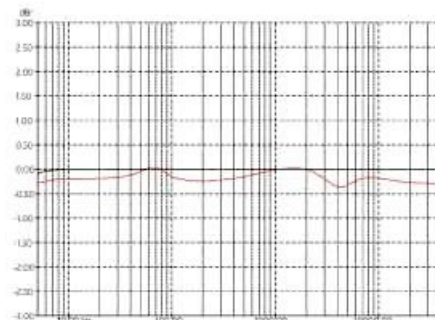
Graph 2. Total harmonic distortion (THD) at 1kHz at an output of 1-watt into a 4-ohm non-inductive load, referenced to 0dB.



Graph 4. Total harmonic distortion (THD) at 1kHz at rated output (160 watts) into a 4-ohm non-inductive load, referenced to 0dB.



Graph 6. Frequency response of line input at an output of 1-watt into an 8-ohm non-inductive load (black trace) and into a combination resistive/inductive/capacitive load representative of a typical two-way loudspeaker system (red trace).



Test Labs for this particular test. Channel balance was excellent at 0.02dB (at 1kHz) and interchannel phase also excellent, measuring just 0.01° at 20Hz, 0.05° at 1kHz and 1.11° at 20kHz. These results are particularly good since Audia Flight says this amplifier is essentially a 'dual mono' design.

Distortion at one watt was fairly high for both 8Ω and 4Ω test loads, with *Newport Test Labs* measuring overall THD+N of 0.14% for a 1kHz test signal. The structure for the

distortion into an 8Ω load is shown in Graph 1. You can see that both the second and third harmonics are sitting at around -60dB (0.1%) with a fourth at -90dB (0.0031%) a fifth at -71dB (0.0281%) and a sixth at -88dB (0.0039%). The six higher-order components visible on this graph are all around 100dB (0.001%) or more down.

Graph 2 shows distortion into a 4Ω load at an output of one watt. The second harmonic sticks on -60dB (0.1%) but the third harmonic component increases to -54dB (0.1995%). The fifth harmonic also increases (to -60dB or 0.1%), with the sixth harmonic coming up to -70dB (0.0316%). At this lower impedance, higher-order harmonics rise in level compared to into an 8Ω load, but with two exceptions (the 8th and 9th) all are more than 90dB down (0.0031%). Overall distortion gets very slightly higher at rated output, with *Newport Test Labs* measuring total THD+N at 0.15% and interestingly, there is almost no difference between the measurements into 8Ω and 4Ω loads. The second harmonic distortion is at -60dB (0.1%), the third and fourth are at around -70dB (0.0316%) and the sixth and seventh at around -77dB (0.0141%). Then,

right out to the 17th harmonic, all are around -70dB (0.0316%).

Intermodulation distortion (CCIF) followed the same pattern as the harmonic distortion measurements, in that they're all more like the distortion I expect to see from a valve amplifier than what I expect from a solid-state amplifier. The two test signals at 19kHz and 20kHz (Graph 5) result in a regenerated signal down at 1kHz that's only 58dB down, plus the high sidebands also result in additional signals at 2kHz, 3kHz and 4kHz.

The noise of the FL Three S was low, with *Newport Test Labs* measuring 81dB unweighted referenced to one watt, a figure that increased to 88dB with A-weighting. Referenced to rated output, the overall figures measured were 99dB (unweighted) and 107dB (A-weighted). For an integrated amplifier to so significantly break through the 100dB barrier (clearing it by 7dB, in fact) is quite an achievement. (It also exceeded its manufacturer's claim of 95dB by a long shot!) You can also see the distribution of the noise across the audio band from Graph 1, with the noise mostly more than 120dB down: it's only the low-frequency, mostly mains-related noise that is above that level.

For an integrated amplifier to so significantly break through the 100dB barrier (clearing it by 7dB, in fact) is quite an achievement.

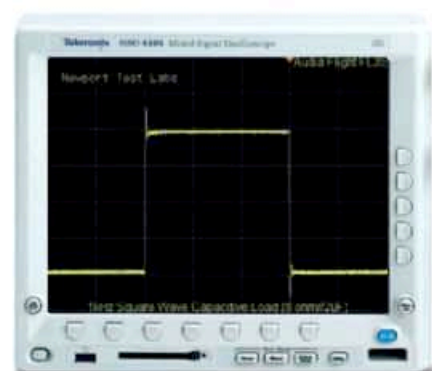
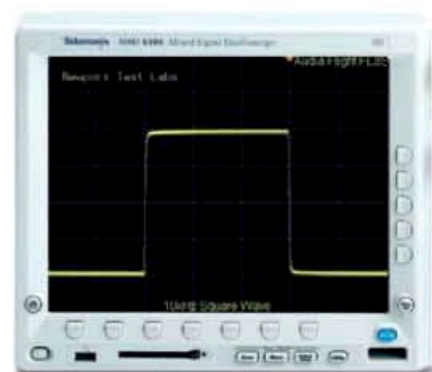
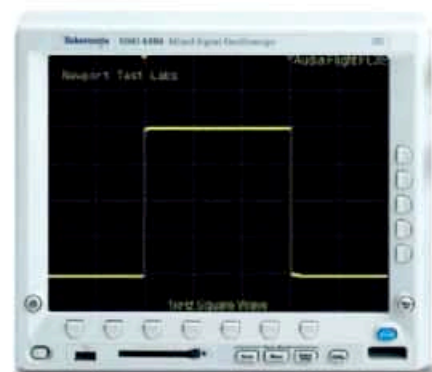
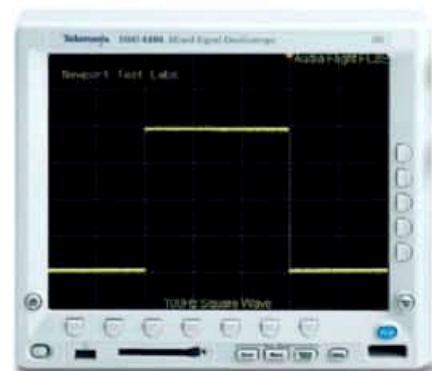
The frequency response of the Audia Flight FL Three S was very extended, extending from less than 1Hz to 510kHz (-3dB) and from less than 1Hz to 251kHz (-1dB). This makes this amplifier an extremely wide-bandwidth design. As you'd expect from this, the frequency response within the audio band into a standard 8Ω non-inductive laboratory test load is absolutely ruler-flat, as you can see from the black trace on Graph 6. The trace doesn't start rolling off at low frequencies until 4Hz, and is only 0.1dB down at 5Hz, which is the graphing limit. The FL Three S's frequency response into a load that simulates a typical two-way loudspeaker (red trace) was almost equally good, with Newport Test Labs measuring an overall response for this load as extending from 5Hz to 40kHz (±0.2dB).

As you'd expect given the enormous bandwidth and the amplifier's linearity, the square wave responses recorded by Newport Test Labs were outstandingly good, with the 100Hz and 1kHz square waves in particular looking like they'd come straight from the signal generator, rather than via the Audia Flight FL

Three S. The 10kHz square wave shows just the slightest hint of rounding on the leading edge, but is otherwise perfect. The response into a highly reactive load (1kHz cap) was also exceptionally good, with basically just a single overshoot to barely 1/8th wave height that was damped within one cycle. It appears this was a design intention that resulted from the company's decision to use current feedback rather than voltage feedback, with the result that, in the company's words: 'the feedback is closed before the output stage ... the resulting outcome consists of fast, stable circuits with the utmost ability to control even the wildest reactive loads.'

Output impedance was relatively high, at 0.3Ω, which as a direct consequence means damping factor was relatively low, at 26 (@1kHz), again meaning the Audia Flight FL Three S will be more valve-like in its relationship with the loudspeakers it's driving.

The Audia Flight FL Three S's test results show all the hallmarks of an amplifier that's been designed to sound good, rather than measure well, yet it still performed very well



Audia Flight FL Three S Integrated Amplifier Test Results – Power Output Measurements

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	105	20.2	110	20.4	87	19.3
2	8 Ω	103	20.1	106	20.2	85	19.2
1	4 Ω	169	22.3	187	22.7	121	20.8
2	4 Ω	156	21.9	170	22.3	121	20.8

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

Audia Flight FL Three S Integrated Amplifier Laboratory Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	<1Hz – 251kHz	-1dB
Frequency Response @ 1 watt o/p	<1Hz – 510kHz	-3dB
Channel Separation (dB)	107dB / 80dB / 55dB	(20Hz / 1kHz / 20kHz)
Channel Balance (Direct/Tone)	0.02	dB @ 1kHz
Interchannel Phase (Direct)	0.01 / 0.05 / 1.11	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.14% / 0.15%	@ 1-watt / @ rated output
Signal-to-Noise (unweighted/weighted)	81dB / 88dB	dB referred to 1-watt output
Signal-to-Noise (unweighted/weighted)	99dB / 105dB	dB referred to rated output
Input Sensitivity	47mV / 487mV	(1-watt / rated output)
Output Impedance	0.3Ω	at 1kHz
Damping Factor	26	@1kHz
Power Consumption	0.26 / 38.55	watts (Standby / On)
Power Consumption	46.35	watts at 1-watt
Mains Voltage Variation during Test	236 – 254	Minimum – Maximum

on Newport Test Labs' test bench, though the results returned alternated between those that would be typical of a good valve amplifier (i.e. THD, IMD, DF) and those that would be typical of a state-of-the-art solid-state design (i.e. frequency response, bandwidth, signal-to-noise ratios, square wave performance). *Steve Holding*