

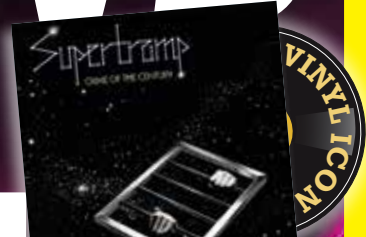
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# TechDAS Air Force IV/Reed 1H

This latest TechDAS turntable sees all the core technologies of its premium models, including an air bearing and vacuum LP hold-down, engineered into a compact chassis  
 Review: **Ken Kessler Lab: Paul Miller**

**T**wo essential features define all TechDAS turntables: an air bearing beneath the heavy platter and vacuum hold-down of the LP.

From the inboard-motor entry-level Air Force V [*HFN* Jan '19] to the king's ransom Air Force Zero, all possess those two operational niceties, while the Japanese manufacturer's top two models add an air suspension for the entire chassis. The latter is less important if your floor is solid or your equipment stands rigid, but the air bearing and vacuum hold-down are the deal makers. And the new Air Force IV at £19,998 may be the best deal of all.

At first, the Air Force IV looks like a post-Ozempic Air Force III Premium [*HFN* Jun '19], thanks to its smaller form factor and lighter chassis colour. As the IV brings the motor inboard, enabling precise belt tension, the footprint itself is reduced to 421x168x368mm (whd). Meanwhile, the total weight is slashed from the Air Force III Premium's 55kg (the gunmetal platter accounts for 29kg) to 34.3kg, of which 8.7kg is the solid one-piece aluminium platter. Chassis materials differ, too. The III Premium's is made of polished, black anodised precision-machined aluminium alloy (A5056), while the IV's is silver anodised solid aluminium alloy (A5052).

**PUMP IT UP**

The PSU/vacuum pump is separate [see p77], using pneumatic tubes to feed air into the 'bearing' and create the suction for the hold-down. Air floods out across the surface of a fixed polished glass disc under the platter, lifting it a few microns to reduce the load on the physical bearing. However, you should never attempt to turn the platter without the air being pumped, for fear of scratching the glass surface. The PSU/pump weighs 9kg but, thanks to a sprung suspension, is very quiet.

**RIGHT:** Top-down view highlights the Air Force IV's compact footprint – three corners will host an armboard. The inner and outer 'rings' of the platter have soft rubber seals that maintain the LP-clamping/flattening vacuum

While arguably being prettier, the IV will still be instantly recognisable to those familiar with the Air Force V or III. At the front is the control panel for selecting speeds and adjusting pitch, and turning the suction on and off. It also has a display to indicate speed, speed lock and other operations such as standby.

At the front right and two rear corners of the chassis are mounts for individual armboards. The positioning of the motor precludes adding a fourth arm to the front left – but surely a trio of arms is enough? The Air Force IV will accept 9in and 12in arms and comes supplied with one armboard cut to suit the customer's choice.

Arguably, the repositioned four-pole AC synchronous motor is the IV's biggest update. Instead of sitting entirely outboard, it resides in a niche under a neat cover that's integrated into the chassis. Under this easily removable cover [see pic, below] are fitments that allow the user to adjust the initial tensioning of the 4mm double-side polished polyester fabric flat belt – the

deck itself fine-tuning the final tension. The promise here is improved speed stability [see PM's Lab Report, p79].

**ARM ADDITION**

Our sample was fitted with the new Reed 1H tonearm (£3098). A first for Reed is an armtube made of carbon fibre, the company opting for the material after finding a way to give it 'acoustic properties close to ones that normally are typical for the wood'. Reed uses soft wood inside to damp the carbon fibre tube, which it

*'The superb retrieval of Johnny Rivers was no fluke'*

feels sounds better than carbon fibre on its own. Whatever the logic – and much space is devoted to its technical specs on Reed's website – this is a great-sounding arm.

The 1H is less fussy or complex than more expensive Reed models [*HFN* Apr '24], and is available in three lengths (9.5in, 10.5in or 12in) and black or white finishes. The arm has a 'cardanic' bearing system, with the vertical axis using thrust rotation bearings and the horizontal axis on thrust pivot bearings, as per Reed's 3P. The 1H



*'Unlike the similarly sized III, the IV's motor hub is part of the chassis, enabling precise belt tension'*



**LEFT:** Pushbutton controls set into a panel offer on/off, speed select with fine speed adjust, vacuum hold-down and a digital display. The AC motor housing is now part of the deck's chassis

provides azimuth adjustment, a user replaceable headshell and VTA adjustment also similar to that of the 3P model.

### FUTURE CLASSIC

Sometimes, it takes only a few seconds to recognise when you're in the presence of greatness. Even with a knackered LP, the Air Force IV exhibited a quietness and confidence, as well as Sherlockian analytical powers, to establish itself as a future classic. It was a tormented, abused copy of Johnny Rivers' *Meanwhile Back At The Whisky À Go Go* [Imperial LP 12284] which, despite grit and scratches, sounded so real and vibrant that it evinced not just respect for the deck but for the artist.

This is a singer who has rock 'n' roll in his veins, and the live performances of rock standards like 'Susie Q' and an early cover of The Beatles' 'I'll Cry Instead' were delivered with such impact that the surface noise disappeared like tinnitus in a hurricane. There was something about the playback that enabled you to listen through the detritus. In addition to the sounds of the venue, Rivers' distinctive vocals, with his mix of textures and a hint of nasality, were as perfectly reproduced as I have heard... and I am a Rivers devotee.

Toying with a worn-out LP is hardly an ideal way to assess a piece of equipment, but it does educe the belief that a fine system can work wonders with a less-

than-wonderful recording, or in this case an LP in not-so-pristine condition. With the sonic spectacular that is Hall & Oates' *H<sub>2</sub>O* [RCA RCALP6056], a mint original, the bottom end heard on 'Maneater' made me question what was alleged to be the logical sonic sacrifice of the Air Force IV versus the Air Force III. Surely the overall mass of the III, the vastly heavier platter, would lead to greater impact and weight? At no point did it sound like the IV was losing anything to the beefier III.

### BOTTOM BALANCE

While the vocals were proof that the superb retrieval of Johnny Rivers' singing was no fluke, the LP isn't that rich down below and hardly challenged the

IV's bass capabilities. *H<sub>2</sub>O*, on the other hand, is a funkfest characteristic of '80s blue-eyed soul, and I was getting a taste of the IV's canny balancing of the bottom octaves with clean, sweet upper registers. But how did it fit into the

TechDAS hierarchy? I dug out a notorious bass-buster,

Rockin' Jimmy & The Brothers Of The Night's *By The Light Of The Moon* [Sonet SNTF 857], to put it to the test.

This 1980 album has a number of tracks with percussion so massive that they recall Sheffield Lab's *Drum Record*, only with vocals and other instruments. The impact was such that I had to go back and forth between the two decks, and even then the Air Force III only had the edge to a degree that would demand it being partnered ☞

### FLOATING ON AIR

A recent chat with Dan D'Agostino, who worked on turntables prior to founding Krell Industries, and latterly D'Agostino Master Audio Systems [see p29], provided this TechDAS user with moral support: Dan, too, uses an Air Force III Premium. 'I don't see how anyone can argue with the superiority of vacuum hold-down', he says, 'no matter how heavy a weight or how tight a clamp, nothing will secure an LP to the platter like vacuum hold-down [powered by a pump, see inset], ensuring the vinyl will not send vibrations back to the stylus'.

Like so many other converts to vacuum hold-down, Dan was first introduced to the technology via John Bicht's Versa Dynamics turntable of 1986, now a serious collector's item. Dan told me it 'blew away' the then-champion, the hugely expensive Goldmund Reference, and at a fifth of its price. But Versa wasn't the first: Luxman debuted vacuum hold-down in 1980 with the PD-555, inspired by its use on professional record-cutting lathes. A flagship model, it was followed by the more accessible PD-300 [HFN Jul '81] a year later. Direct precursors to the TechDAS models, however, are Micro-Seiki's SX-8000 II, SX-555FVW, RX1500 and BL-99V. The link? TechDAS founder Nishikawa-san was a designer at Micro-Seiki, which also introduced an air bearing in the SX-555FVW.



# LAB REPORT

## TECHDAS AIR FORCE IV/REED 1H

Although the Air Force IV's two-phase, four-pole AC synchronous motor brings the 8.7kg platter up to speed in 4-5secs (total moment of inertia is a claimed 734kg/cm<sup>2</sup>) the deck's digital readout takes a further 4-5secs to fully settle. With belt tension fully optimised, absolute speed accuracy is within +0.035% and peak wow is a fabulously low 0.015%. The Air Force IV offers the same excellent low-rate pitch stability seen in the One [HFN Jun '13], Two [HFN May '15] and III Premium [HFN Jun '19] although, in common with the latter, there is a higher-rate flutter here at ±39.5Hz [see Graph 1, below] that correlates with a discrete mode seen on the unweighted rumble trace [not shown here]. This is unlikely to have any adverse subjective consequence. Once again, pumped air escapes smoothly across the polished glass surface under the platter, raising the rotating mass by some 30µm and maintaining a low through-bearing rumble of -72.5dB (DIN-B wtd re. 1kHz at 5cm/sec). With the vacuum hold-down in effect, the through-groove rumble is reduced to just -76.0dB – the lowest figure yet recorded in our tests!

The partnering 9.5in Reed 1H arm, equipped with a slender, wood-damped carbon-fibre wand, offers a usefully low 12g effective mass for good compatibility with most MMs and higher compliance MCs. The flat, detachable headshell 'paddle' and low friction/stiction multi-unipivot bearing – already seen in its 3P model [HFN Apr '24] – bring their own resonances, notably at 515Hz, 730Hz and 1.2kHz, to the 185Hz main bending mode of the wand with harmonics and/or rotational modes at 235Hz and 335Hz [CSD waterfall, Graph 2]. These modes are of relatively low amplitude and quick to decay, unlike the high-Q resonances typically associated with undamped carbon-tubed arms. PM



**ABOVE:** Pneumatic hoses from the outboard pump [see p77] are connected to the air-bearing 'Flotation' and LP hold-down 'Vacuum' fittings while power, pump and speed controls are communicated via a multi-pin connector

with the kind of wide-bandwidth system able to plumb the depths.

The weight of the Air Force IV was so convincing that it became an academic issue, or one of bias. Instead, I swerved to focus on other areas where the IV

was proving itself to be an alternative to the III for different reasons. One area that manifested itself enough to establish the IV as having its own skill set was

heard via the mono edition of Tom Rush's *The Circle Game* [Elektra EKL4018]. While I knew that the III was capable of delivering mono so gloriously wide and deep, I wasn't expecting the IV to throw out front-to-back depth that exceeded it.

Okay, so it's one rather specific detail, and hardly as crucial to one's listening pleasure as, say, transient attack, but on 'No Regrets' I was hearing layering which narrowed the gap between mono and stereo in terms of satisfying soundstage recreation. The IV filled the space so deftly that mono versus stereo ceased to be an issue.

### HEROIC SOUNDS

Two other areas were so close as to cause bewilderment – transient attack and retrieval of low-level details. As for the latter, the Air Force IV is so quiet and clean that I swear I was hearing effects on The Kinks' 'Celluloid Heroes' [Everybody's In Show Biz; RCA LSRCA 70504/5] that had eluded me for 53 years. But it was the speed and recovery of the transients on *H<sub>2</sub>O* that created the notion of the IV having a slightly different 'voice' to the III.

I am not going to say it was as night-and-day as comparing tubes

with transistors, but careful, intense and even frustrating listening allowed me to differentiate between the two, the vast cost disparity notwithstanding. That in itself makes all of this moot. But I was able to tell which was which thanks to my old faves, the J. Geils Band.

'Did You No Wrong' from *Ladies Invited* [Atlantic SD 7286] features each of the band's members displaying virtuoso talents on guitar, harmonica, drums and assorted

keyboards. Both decks allowed the listener to zoom in on each, or simply sit back and savour the experience.

Where the two differed was in presentation. The

Air Force III was more revealing, more analytical, with the kind of grip and command which places great demands on the rest of the system.

### IT'S A FAIR COP

And the Air Force IV? It was almost forgiving, or warmer, as if the two turntables were playing 'Good Cop, Bad Cop'. They are not mutually exclusive. They beg that overused (by me) analogy of a Porsche Cayman vs 911: the price keeps them apart, but the performance lets you know they're siblings. ☺

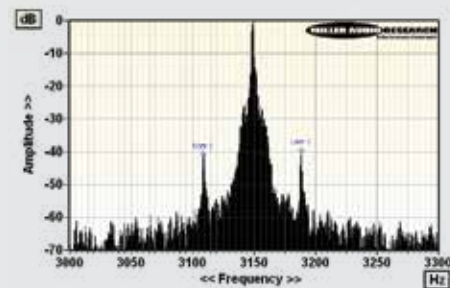
### HI-FI NEWS VERDICT

Sometimes a product is *too* good, amplifying the Law of Diminishing Returns. Heard side-by-side with the dearer Air Force III Premium, it was a challenge to identify any sonic deficits in the TechDAS Air Force IV. With only the loss of a fourth tonearm option and the use of a lighter platter and chassis, it reduces not just the footprint but the price of entry to the upper reaches of the range. This is a dream machine.

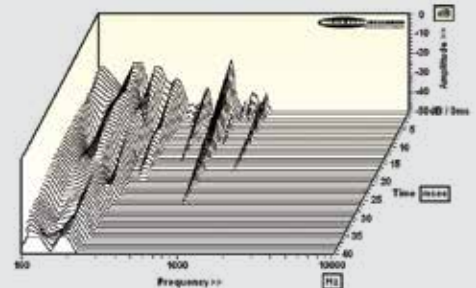
Sound Quality: 90%



'I was getting a taste of the IV's clean, sweet upper registers'



ABOVE: Wow and flutter re. 3150Hz tone at 5cm/sec (±150Hz, 5Hz per minor division). Flutter is marked



ABOVE: Cumulative resonant decay spectrum for the Reed 1H tonearm, illustrating various structural support and tube vibration modes (100Hz-10kHz over 40msec)

### HI-FI NEWS SPECIFICATIONS

Turntable speed error at 33.33rpm	33.32rpm (-0.035%)
Time to audible stabilisation	5sec
Peak Wow/Flutter	0.015% / 0.035%
Rumble (silent groove, DIN B wtd)	-76.0dB
Rumble (through bearing, DIN B wtd)	-72.5dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-64.5dB
Power Consumption	32W
Dimensions (WHD) / Weight	421x168x368mm / 34.4kg