Airpulse Model-1

MARTIN COLLOMS ASSESSES A NEW ACTIVE- MINIATURE SPEAKER WITH NUMEROUS USEFUL FEATURES, DESIGNED BY PHIL JONES

A few months ago, Acoustic Energy founder Phil Jones announced a compact two-way active loudspeaker of similar size to the *AE1*, from a US registered company called Airpulse. Although it has taken a little while to get hold of review samples of the *Model-1*, good things may well come in threes and this issue features no fewer than three compact loudspeakers, all actively driven, but that's about all they have in common.

The Airpulse *Model-1* is supplied on a direct sale basis at £949 per pair; matching floor stands are available for £200/pr. These compact two-way loudspeakers are fully active with multiple connection possibilities: analogue (both balanced and single ended); digital input formats (optical and RCA wired); and wireless Bluetooth-APTx. It will accept a digital audio connection at up to 192kHz, but there's no USB socket for computer connection.

Right away the *Model-1* is distinguished by the dominant appearance of a substantial, vertically-oriented, horn-loaded ribbon tweeter with an aluminium alloy chassis. The ribbon itself is 75mm high, which has implications for narrowing the vertical axis directivity.

This tweeter is complemented by a pistonic bass/mid driver with a 110mm cast chassis, and a metal alloy cone. The latter has an advanced design, with a short-coil/long-gap motor powered by an enclosed neodymium magnet. The enclosure is built of 25mm MDF, with panel bracing and a textured synthetic internal absorption material. A large, flared reflex loading vent is located on the back, behind the tweeter. Power amplification is by three Texas *TAS5754* two-channel class D switch-mode chips. One works in stereo at 2x10W for the two tweeters (the high efficiency of these horn-loaded designs doesn't need much power). At low frequencies, the other two amplifier chips are run in bridged mode to deliver up to 50W RMS into each bass driver.

A powerful programmable DSP chip, also from Texas Instruments, handles the synthesis of the bass and treble crossovers; the power management; correction for the bass cone breakup; and defines the overall target frequency responses. Much of this technology comes from the Edifier *S2000 Pro Mk II Active 2.0* loudspeakers, Edifier being a Chinese operation that was established in 1996.

It was interesting to discover that one of the pair (left) was entirely passive, with no controls, indicators, power supplies (or crossover network): just a DIN socket. The speakers are supplied with a fairly thick 5m DIN-to-DIN umbilical cable. This is a fixed length, and carries the bass and treble power for that channel from the 'master' loudspeaker (with the power amps and other electronics) to the slave. This means that in a normal arrangement the wired audio sources, for line-in audio, optical feed etc (and of some length) will need to be located on the right. Mine are on the left so I swapped over the speaker channels, left for right and vice versa. That umbilical also means that a speaker spacing wider than about 2.5m cannot be adopted without making up a longer cable. (Note also that there is no balance control.)

The lightweight, palm sized remote had a battery fitted (a coin lithium) and was effective, indicating activity *via* a subtle green/blue indicator on the controlled loudspeaker. The lower three buttons (operating part sequentially) are for switching Bluetooth, balanced input, single-ended input, optical input and the co-axial RCA digital input; the upper buttons control the volume. The IR receiver status indicator is centre right of the main speaker panel. The manual ±3dB bass and treble adjustments are on the back; these are inactive for the balanced inputs, and are only operational on the analogue RCA phono and the digital connections.

Sound Quality

This speaker sounded a tad reticent to start with, and needed some loosening up on heavy rock for a few days before it began to flow a little better. Once settled, we began with Tom Koopman, playing the *Bach Toccata in C minor*. This classic cathedral organ track sounded a little muddled on the more complex scoring, with some secondary 'flutter' of treble 'breath' sounds seemingly modulated by the more powerful lower frequencies. Here it seemed to trip over itself, and simpler pop tracks fared rather better.

Although rock material sounded suitably crisp and quite dynamic, punchy, and with pleasing attack, it really did, quite unexpectedly, sound out of time: focus on the lead guitar and the bass player sounds late. The clearly explicit instrumental parts did not seem to gel to a solid focused beat,

MARTIN COLLOMS

despite the evidently clean and powerful bass; the crisp, informative and dynamic treble; and the fine dynamic headroom. It certainly had no problem playing loud and clean, and the timing issue may well matter less to some listeners; on this subject a personal trial is advised.

There was some initial confusion, until we realised that the tone controls were in the DSP section and were inactive *via* the balanced analogue input. We switched to the digital input (optical S/PDIF only), whereupon the tone controls became operative. A little bass lift and 1dB of treble cut helped rebalance the sound in my larger room, where the speakers were mounted on Acoustic Energy cast alloy stands, and located in free space.

While they sounded superficially impressive, the *Model-1*s were actually not particularly transparent, and the stereo image didn't extend very far behind the plane of the loudspeakers. While the drivers were quite well integrated, the overall frequency response did not sound wholly neutral, was a bit uneven, and also a bit lightweight. The horn treble was noticeably directional: listener height and loudspeaker azimuth was critical when searching for optimum sound quality, and small variations in head height altered the sound

Pink Floyd's *Dogs of War* sounded rather brash, some depth layering was missing, and again the timing was awry (though timing was judged a little better on the digital than the analogue inputs). The Bluetooth sound was somewhere in between these two, both for quality and for timing. Interestingly, the image remained rather two dimensional even with strongly reverberant programme. Stage depth was rather finite and didn't extend much beyond the plane of the loudspeakers. However, it could play loud and was quite dynamic.

Conclusions

This well finished and presented active loudspeaker has versatile connection options including wireless remote control, and music streaming *via* an up to date Bluetooth APTx connection. The remote control is also useful for both analogue and wired digital signal modes. It is powerful and has certain qualities, but the musical timing had a detached quality that was not fully rewarding, and some colorations were also heard. We felt that the whole did not equal the sum of the parts, despite the competitive pricing that seems very attractive in view of the build quality and many facilities.

Test Results

We noticed some characteristic sound quality factors during the auditioning, some of which were down

to the frequency responses. A mild 'sting' in the high treble, heard as a high frequency 'edge' to some sounds, is seen in an on-axis treble rise of +4dB in the range 16kHz - 25kHz. (We heard the lower frequency part at least!) It's outstanding from 80Hz to 800Hz, whereupon a -6dB on-axis deep trough is seen at 1kHz, and this feature is characteristic of the output on all axes. This result means that the lower treble is then prominent in the energy response, the upward step of some +2.5dB constitutes an audible feature.

While high frequencies are not very uniform overall, the horn geometry does deliver exceptional lateral consistency off-axis (noting that the significant ribbon height imparts a loss over the

The Review System

Townshend *Allegri*, Linn *Klimax DS* streamer-DAC (with volume control) control units; Naim *SuperLine* phono pre-amp with Linn *LP12* player, *Keel* chassis, *Radikal* motor, Naim *Aro* arm, Lyra *Delos* cartridge vinyl source; Naim *UnitiServe* network server and S/PDIF source; Naim *NDS, 555 PS(DR)* streamer-DAC; Wilson Audio *Sabrina*, Magico *S-5II*, Quad *ESL63* , BBC *LS3/5a* (15ohm) speakers; Naim *FRAIM* racks; Transparent *MM2* and Naim *NAC A5* speaker cables; Naim *Super Lumina,* Transparent *MM2* and Van den Hul *Carbon TFU* interconnects.

Manufacturer's Specifications

Inputs	
Balanced	000±50mV
Aux	550±50mV
Bluetooth	1000±50mFF
Optical	350±50mFFs
Coaxial	350±50mFFs
Signal-Noise Ratio	≥90dB (A wtd)
Power (each)	70W + 20W
Frequency Response	30Hz-20kHz
Size (WxHxD)	9 x 14 x 12in
Weight	21lbs

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vertical axis, with a fall-off that's rather poorer than average). That final high frequency lift is quite powerful, and also registers in the room average response as a 19kHz prominence. This is where the output would normally show a gentle decay, due to increasing room absorption and driver directionality, and this was audible as well. The off-axis lumpy response remains and generates somewhat coloured sidewall reflections. The bass is 'tuned up' for some extra weight from 60 – 110Hz, but as a consequence there's then some loss of extension and 'growl' to lower frequencies.

This speaker shows an impulse response with some pre-echo, or pre-ringing. This is also evident on the waterfall decay set, visible as the set of spikes seen far right, from t = 0 to t = 0.3mS. This potentially audible artefact occurs before the main response has begun (and is probably due to the digital input filter).

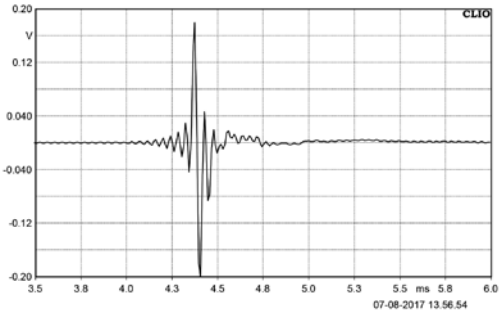
The early decay with frequency (waterfall display) is very fast, but later (beyond 1ms) some resonances do intrude, notably at 11kHz and 19kHz. Later on the visible 1kHz dip resolves to a decay ridge with some associated coloration.

The measured distortion was audibly distorted by 90dB (1m at 100Hz). At 85dB I measured 1% second, 0.6% third and 3% fourth harmonic, and these were audible. (I made sure the input was not overloaded for this test.) At 89dB 200Hz second harmonic was 1.2%, third 1.2%, and fourth a good 0.05%. By 2kHz at this level, second was 0.12% but third was 1%, which is a bit high for comfort. In the mid treble (6kHz) second was 0.09%, but third was a just audible 0.31%. Only by dropping to 80dB spl did third harmonic fall below 0.1%. For a realistically loud 50Hz, 90dB sound level, third harmonic was a clearly audible 10%. Reflex tuned to 38Hz (the point of maximum bass power for an average level of 84dB), the second harmonic distortion was 0.25% and third was 3.5%, which is considered mildly audible at this low frequency and level. Overall these are purely average results

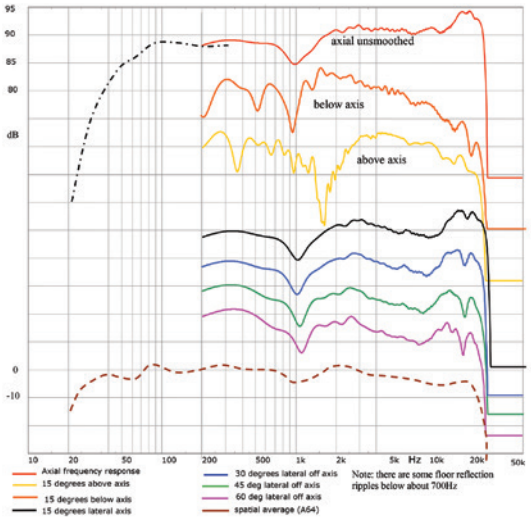
HIFICRITIC Loudspeaker laboratory measured test results July 2017

Make, Country of Origin	Airpulse, US designed, made in China
Model	Model-1, moving-coil + ribbon, shelf or stand, vented loading
Price per pair	£949 (direct sale) (stands £200)
Finishes	satin lacquer cherry
Size(WxHxD),	20.3 x 35.5 x 29.5cm
Weight	9kg, 18.5lb approx weight
Type	Bass Reflex 2 -way 11cm custom design alloy cone bass- mid High frequency 75mm by 25mm horn loaded, aluminium ribbon, transformer coupled
Amplifiers	Active: 55W LF, 10W HF; DSP-corrected switch-mode technology
Frequency response, axial	42Hz - 23kHz ±5dB (listener axis)
Frequency response off- axis	see graphs and in-room response
Bass extension	40Hz -6dB, (38Hz, -6dB in-room limit)
Max loudness in-room	103dBA for a stereo pair (estimated)
Power rating (max, min)	Active sensitivity: 1V balanced, 550mV S-E (+ Optical, Bluetooth)
Placement	Shelf or stand
Controls	Bass and treble level controls ±3dB (not for balanced input)

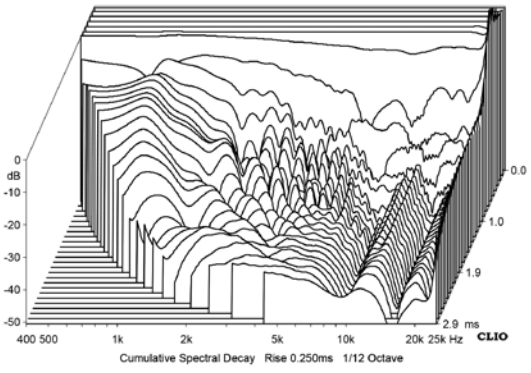
Airpulse Model-1 Impulse Response (note acausal behaviour and ringing



Airpulse Model-1 Frequency Responses



Airpulse Model-1 Waterfall Decay of Level with Time and Frequency



Audio Note (UK) DAC 4.1

KEVIN FISKE EXAMINES THE CURRENT VERSION OF THE BALANCED AUDIO NOTE (UK) DAC 4.1x

KEVIN FISKE

Many audio companies assert that a circuit can sound good even if the resistors, capacitors, diodes and other electronic components are standard commercial off-the-shelf items (COTS is the common acronym). Audio Note (UK) is one of relatively few companies which argue that component quality matters very much indeed. The company is not saying that cheap components flying in formation cannot sound good. It is saying that the same circuit implemented with quality components may sound even better.

For the most expensive Audio Note UK products, nothing less than the best will do, such as silver end-capped and-wired non-magnetic tantalum resistors, *Black Gate* electrolytic capacitors, and in-house designed and built transformers using costly core materials and silver windings on both primaries and secondaries.

That this is still a contentious issue, and draws snorts of derision from some quarters is illustrative of the bizarre state of denial that exists across much of the audio industry today. Even the most junior engineer will acknowledge that carbon film and metal film resistors of identical electrical values sound different. To argue therefore that the use of alternative materials to these doesn't similarly result in different sonic fingerprints being realised is inconsistent. Whether we *like* the alternative sound is a matter of honest subjectivity, and we might cavil about the alternative materials on the grounds of affordability, but to deny that materials make a sonic difference, or to ridicule companies that seek to push the materials boundaries, is either revealingly ignorant or simply commercial gamesmanship.

Capacitors

After conducting bench and listening tests of *Black Gate* capacitors for *HiFiNews* in 2003, Martin Colloms observed: *"Referenced to the benchmark of the best known non-*Black Gate *capacitors (including* Nichicons*, Elna* Cerafines *etc), the soundstage of the test amplifier after its treatment was remarkably expanded in width and depth, yet its focus is still more solid. Images now hung in space, set in floodlit pools of detailed acoustic ambience. Subtleties which were previously just hinted at were now firmly and expressively delineated. Every point in the audible frequency range was clarified, sharpened, resolved. Rhythm and timing are redefined. Musical notes appear to linger in time and space, of near perfect entity and with breathtakingly natural instrumental and reverberant decay compared with previous experience of that design.*

Colorations which were previously blamed on circuit behaviour and specific active devices (if you like, its technology makeup) were in this unit now seen to be largely the fault of

"Even the most junior engineer will acknowledge that carbon film and metal film resistors of identical electrical values sound different"