ROBERT DEUTSCH

Focal Aria 936

LOUDSPEAKER

Founded in 1979 by Jacques Mahul, Focal—formerly known as JMlab and as Focal-JMlab—is one of audio's success stories. Beginning with a single speaker model produced in a small workshop in Saint Etienne, France, the company is still headquartered there, but has expanded to employ over 250 workers, making products exported to over 160 countries. All Focal products are engineered in France; only a few lower-priced multimedia models and headphones are assembled in the Far East.

Focal makes products in six categories: 1) high-fidelity speakers, 2) home cinema, 3) multimedia and wireless, 4) headphones, 5) monitoring and pro studio, and 6) custom and public address. Of course, our interest here is in No.1. The *2014 Stereophile Buyer's Guide* lists 21 Focal speakers, with prices ranging from $549 to $190,000/pair. The Aria 936 is too new to be listed in the *Guide*, but its price of $3995/pair puts it at just about the median.

Although Focal makes some very expensive speakers, one of their priorities has been to incorporate the technology developed for their top models into more modestly priced products. This was true for the Focal Chorus 826W 30th Anniversary Edition loudspeaker (I reviewed it in the November 2010 issue[1]), which used the proprietary W-sandwich–cone midrange and woofer technology found in Focal's more expensive speakers.

Focal describes the ideal loudspeaker cone as being: 1) light, to allow rapid acceleration; 2) rigid, for pistonlike movement; and 3) well damped, for low coloration. In their view, these often conflicting goals are best met by a "sandwich" construction of different

1 See http://tinyurl.com/nszzljb.

SPECIFICATIONS

Description Three-way, five-driver, floorstanding loudspeaker. Drive-units: 1" (25mm) aluminum-magnesium TNF inverted-dome tweeter, 6.5" (165mm) flax/fiberglass sandwich-cone midrange unit, three 6.5" (165mm) flax/fiberglass sandwich-cone woofers. Crossover frequencies: 260Hz, 3.1kHz. Frequency response: 39Hz–28kHz, 43dB. Sensitivity: 92dB. Impedance: 8 ohms nominal, 2.8 ohms minimum. Recommended amplification: 50–300W. **Dimensions** 45" (1150mm) H by 11.5" (294mm) W by 14.5" (371mm) D. Weight: 64 lbs (29kg). **Finishes** Black High Gloss, Walnut, and Leather. **Serial numbers of units reviewed** AIAGVF002041, AIAGVF002066, listening; AIAGVF002018, measuring. **Price** $3999/pair. Approximate number of dealers: 279. **Manufacturer** Focal, BP 374-108, rue de l'Avenir, 42353 La Talaudrière Cedex, France. Tel: (33) 4-77-43-57-00. Web: www.focal.com. US distributor: Audio Plus Services, 156 Lawrence Paquette Industrial Drive, Champlain, NY 12919. Tel: (800) 663-9352, (450) 585-0098. Fax: (866) 656-0686. Web: www.audioplusservices.com.

materials. Their W sandwich takes this approach, but its production is labor-intensive and thus costly. In a search for a less expensive alternative, Focal developed a new composite material in which flax fibers of various densities form the core of the cone, in a sandwich construction with fiberglass. Unlike for the W cone, manufacturing of Focal's F cone can be automated—and France is apparently the largest European producer of flax. (If, like me, you're a bit uncertain about what flax is, linen is made from flax fibers.

Having developed this new way making midrange and woofer cones, Focal turned their attention to tweeters, and came up with an inverted dome made of an alloy of aluminum and magnesium. It's similar in these respects to the tweeter used in the Chorus 826W, but in the Aria 936 the suspension between the dome and the bracket is made of Poron, a "memory foam" of microcellular urethane. This suspension method has been shown by Focal to reduce distortion by a factor of three in the critical range of 2–3kHz. A polyurethane plate with waveguide is said to improve the new tweeter's horizontal dispersion.

Which Aria?

Focal's Aria 900 line of speakers comprises five models. I'd heard—and been quite impressed by—the Aria 926 at the last Toronto Audio Video Entertainment Show. My only reservation was that, while the 926 generally sounded very good at TAVES, one of the demo recordings was Copland's *Fanfare for the Common Man*, and I found that the bass lacked some weight. At 45" H by 11.5" W by 14.5" D, the Aria 936 is as wide and deep as the 926, but it's 5" taller, to accommodate a third woofer. The 936's claimed low-frequency extension is 32Hz *vs* the 926's 37Hz (both –6dB), and that could make a difference with bass-heavy material. I requested a pair of Aria 936s.

The Chorus 826W was a nice-looking speaker, but the Aria 936 has a more elegant appearance. The finish is impeccable: Black High Gloss on the sides and top, with leather front, rear, and bottom. (It's also available in Walnut.) There are two ports on the front panel, "for more impact," and a downfiring port in the base, "for increased depth."

Setup

Because the Aria 936 has roughly the same footprint as the Chorus 826W, which I'd reviewed, I thought positioning the Arias would not be a problem—and it wasn't. With the help of Audio Plus rep Ian McArthur, who delivered them, I placed the speakers in more or less the usual positions, along the long side of my listening room, and played with their distances from the walls, the listening seat, and each other, until we felt that the soundstage and bass character and extension were about right. The Aria 936 comes with a plinth that conveniently allows you to withdraw and extend the built-in spikes, first by hand, then using the included plastic wrench. This worked very well—I wish other speaker manufacturers had a similar arrangement.

The Chorus 826W has a removable grille that covers the bass and midrange drivers but not the tweeter, which has its own, apparently fixed grille. Fairly late in my auditioning

MEASUREMENTS

I used DRA Labs' MLSSA system and a calibrated DPA 4006 microphone to measure the Focal Aria 936's frequency response in the farfield, and an Earthworks QTC-40 for the nearfield responses. The Earthworks microphone has a small, ¼" capsule, and so presents minimal obstruction to air flow in the ports. For logistical reasons, I measured a different sample from those auditioned by Robert Deutsch. The speaker was bolted to its plinth for the measurements, so that the downward-firing port was the specified distance from the floor. All measurements were performed with the grille removed.

My estimate of the Focal's voltage sensitivity was 89.5dB(B)/2.83V/m—close to the specified 90dB, and usefully a little higher than average. The Aria 936 is specified as having a nominal impedance of 8 ohms and a minimum impedance of 2.8 ohms; my measurement (fig.1) confirmed the minimum value at 108Hz, but as the impedance stays below 4 ohms from the upper bass though the lower midrange, where music has high levels of energy, I would recommended using a amplifier rated into 4 ohms with this speaker.

The small wrinkle at 22.9kHz in the impedance traces indicates that this is the frequency of the metal-diaphragm tweeter's primary breakup mode. The traces are otherwise free from the midrange discontinuities that would suggest the presence of enclosure resonances. Nevertheless, investigating the cabinet walls' vibrational behavior with a plastic-tape accelerometer uncovered modes at 234, 332, and 344Hz. These resonances were lowest in level on the sidewalls (fig.2) and highest on the rear and top panels, where their effects will be less audible.

The Focal's impedance-magnitude trace has a clearly defined minimum value at 40Hz, which would be the tuning frequency of the port in a reflex

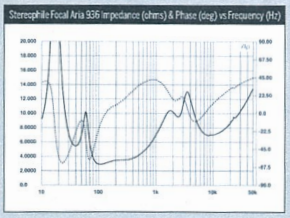


Fig.1 Focal Aria 936, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.).

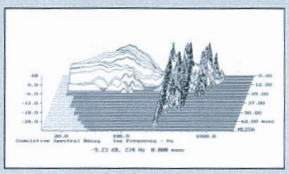


Fig.2 Focal Aria 936, cumulative spectral-decay plot calculated from output of accelerometer fastened to center of side panel level with top woofer (MLS driving voltage to speaker, 7.55V; measurement bandwidth, 2kHz).

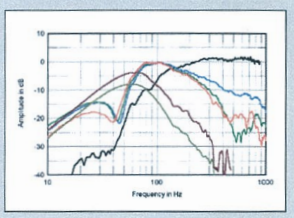


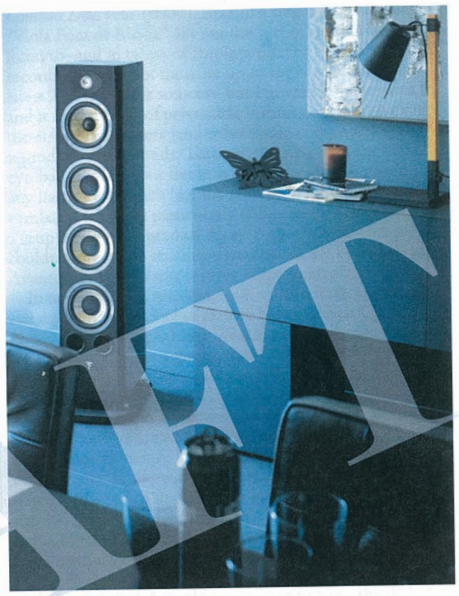
Fig.3 Focal Aria 936, nearfield responses of: midrange drive-unit (black), top woofer (blue), middle woofer (green), bottom woofer (red), front port (purple), bottom port (gray).

of the Chorus 826W I discovered that the tweeter grille *could* be removed with the tip of a ballpoint pen or a paper clip. I did, and was rewarded with greater treble clarity and improved specificity of imaging.

For the Aria 936, Focal has changed the grille arrangement—perhaps because of customer complaints. A single grille covers all five drivers, and it's attached magnetically. What hasn't changed is the fact that the speaker sounds better with the grille removed, which is I how I listened to it (and is what Audio Plus recommends).

Ian McArthur told me that, as far as he knew, the review samples had come straight off the assembly line, with no break-in. But they sounded good out of the box, with only minor improvements after more extensive playing. Focal speakers that use a beryllium tweeter have a reputation for needing a longer-than-usual break-in period if they're not to sound too bright, but that wasn't the case with the Aria 936's aluminum-magnesium tweeter.

When selecting electronics to use with speakers, I often find myself in a quandary. Should I use equipment at a price level that represents a typical or likely pairing, or should I use higher-end equipment that lets the speakers really show what they can do? At various audio shows, Focal's Aria models have been successfully demonstrated with Devialet D-Premier DAC-integrated amplifiers, which are also made in France and distributed by Audio Plus. I was sure that Audio Plus would have loaned me a Devialet for this review, but that would have introduced a second unknown factor into the equation: Before being able to assess the sound of



measurements, continued

design; however, with its three woofers and two ports, the Aria 936's low-frequency behavior is complicated. Fig.3 shows the nearfield responses of the midrange drive-unit (black trace), top woofer (blue), middle woofer (green), bottom woofer (red), front port (purple), and bottom port (gray), all with their levels plotted in the ratios of their radiating diameters. The midrange crosses over to the three woofers at around 150Hz, though the top woofer rolls off a little slower in the midrange than the lower two woofers. The middle and top woofers appear to be loaded by the front-firing port, with very similar minimum-motion notches in their outputs at around 44Hz. The bottom woofer's minimum-motion notch occurs slightly lower in frequency, at 39Hz. Both port outputs are commendably free from midrange resonant peaks.

The complex sum of these nearfield responses, taking into account both acoustic phase and the different distance of each radiator from a nominal farfield microphone position, is shown as the trace below 300Hz in fig.4. A large part of the upper-bass peak apparent in this graph will be due to the inevitable exaggeration of the nearfield measurement technique. But with the overlap between the outputs of the three woofers and the midrange drive-unit in the same region, it is hard to escape the conclusion that the Aria 936 will have too much upper-bass energy in all but very large rooms. I note that Bob Deutsch found that the Focal's bass sounded extended, but without the low frequencies sounding "boomy or bloated," which suggests that the woofer alignment is on the overdamped side. Though the tuning frequencies of the ports bracket 40Hz, close to the frequency of the lowest string of the electric bass and double bass, RD did comment on the

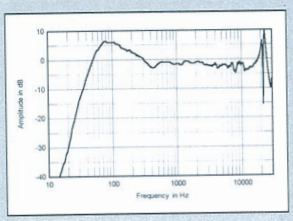


Fig.4 Focal Aria 936, anechoic response on tweeter axis at 50", averaged across 30° horizontal window and corrected for microphone response, with complex sum of nearfield responses plotted below 300Hz.

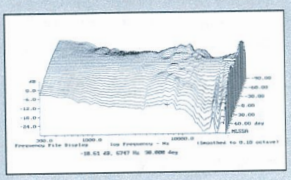


Fig.5 Focal Aria 936, lateral response family at 50", normalized to response on tweeter axis, from back to front: differences in response 90-5° off axis, reference response, differences in response 5-90° off axis.

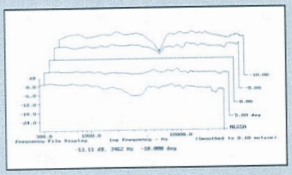


Fig.6 Focal Aria 936, vertical response family at 50", normalized to response on tweeter axis, from back to front: differences in response 10-5° above axis, reference response, differences in response 5-10° below axis.

the Aria 936, I would first have to compare the Devialet with other equipment that I was already familiar with, so that I could get a handle on the Devialet's contribution to the sound (see sidebar, "Confounding, Cables, and Room Acoustics"). That would turn the process into, in effect, a second review—something I wasn't prepared to do.

So I went with the familiar: my own Convergent Audio Technology SL1 Renaissance preamp ($7995), McIntosh MC275LE power amp ($5500), and loan samples of PrimaLuna's ProLogue Premium integrated (at $2299, a real-world option) and Simaudio's Moon Evolution 740P preamp ($9000) and 860A power amp ($14,000). The Simaudios, being new models, weren't entirely known quantities, but I was familiar with their respective predecessors, the Moon Evolution P-7 and W-7. At one point I'd had both sets on hand for comparison, and knew that this pre/power combo was representative of today's top solid-state electronics, the 740P/860A having even greater finesse than the P-7/W-7. My comments on the sound of the Aria 936 represent a kind of "averaging" of the sound with the various amplifiers, with differences as noted.

Sound

Smooth. *Very* smooth. Not *smooth* in the sense of glossing over or subduing the sharp transients that characterize the sounds of certain instruments, but just not exaggerating or sharpening them. This was my initial impression of the Aria 936, and it persisted throughout extended listening.

One of my favorite tests of transient response is track 3 of the *Chesky Records Jazz Sampler & Audiophile Test Compact Disc, Vol.1* (JD37): Brazilian singer Ana Caram's "Viola Fora de Moda." It's not the sort of music I normally listen to—and in terms of absolute fidelity, this 25-year-old recording it may not measure up to the resolution of the latest 24-bit/96kHz sources—but I'm very familiar with it, and it features lots of percussion instruments that challenge the ability of speakers (and other audio components) to reproduce their sounds. Through the Aria 936, the bells, cymbal, etc., rang out freely, with delicacy and without any harshness—much like the real thing. The sound of the cymbal at 0:54 was particularly telling in its clarity, with a crisp onset and a gradual decay. And while the Aria 936 couldn't match the startling dynamics of the horn-hybrid Avantgarde Uno Nano, it came surprisingly close.

In tonal balance, speakers have come a long way from the days when you had to choose between East Coast (mellow, muted highs) and West Coast (bright, punchy, forward) sounds. As a group, the speakers I've reviewed lately—Monitor Audio Platinum 200, MartinLogan Montis, Wharfedale Jade 7, Focal Chorus 826W, GoldenEar Triton Two, PSB Imagine T2 Tower—offer tonal balances in the "neutral" category, and the differences among them fall into a fairly narrow range. The Aria 936 definitely joins them in this category. In olden days (when, as Cole Porter fans will recall, a glimpse of stocking was looked on as something shocking), one was likely to adjust an amplifier's bass and treble controls to compensate for a speaker's departure from tonal neutrality. Tone controls have pretty well disappeared from high-performance audio gear, but if we had them, with the Aria 936 I would be inclined to leave the dials

measurements, continued

Aria 936's excellent low-frequency extension; I suspect that this is actually related to the speaker's exaggerated upper bass.

Higher in frequency in fig.4, the 936's midrange and treble are extraordinarily smooth and even. The rise in response due to the tweeter's primary diaphragm resonance occurs above 15kHz, and it can be seen that there is a sharply defined antiresonance above 20kHz, but below the frequency of the tweeter resonance. A loudspeaker's perceived tonal balance depends not just on its frequency response but also on how that response changes off axis.

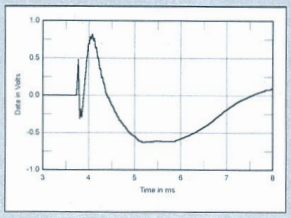


Fig.7 Focal Aria 936, step response on tweeter axis at 50" (5ms time window, 30kHz bandwidth).

Fig.5 shows the Aria 936's horizontal radiation pattern, referenced to the tweeter-axis response. Despite the midrange drive-unit's relatively large radiating diameter, there is only a relatively slight off-axis flare at the base of the tweeter's passband, and the contour lines in this graph are evenly spaced and uniform. As is always the case with a 1" tweeter, the output falls off to the sides above 10kHz, but this will not lead to a lack of top-octave air in rooms of normal size. In the vertical plane (fig.6), a suckout at the upper crossover frequency occurs 10° above the tweeter axis, but as the tweeter is a high 43" above the floor, this will not be a problem. The average ear height for a seated listener is 36" from the floor, so it's just as well that the upper-frequency suckout doesn't start to develop until 10° below the tweeter axis.

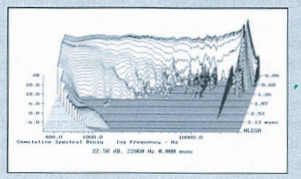


Fig.8 Focal Aria 936, cumulative spectral-decay plot on tweeter axis at 50" (0.15ms risetime).

Turning to the time domain, the Focal Aria 936's step response on the tweeter axis (fig.7) shows that the tweeter and midrange drive-units are connected in positive acoustic polarity, the woofers in inverted polarity. But more important than the individual drive-unit polarities is the fact that the decay of each unit's step smoothly blends with the start of that of the next lower in frequency. This suggests optimal crossover design, given the different distance of each unit's acoustic center from the microphone position. RD commented on the Aria 936's superb transparency, which is what I would have expected from the clean decay seen in the speaker's cumulative spectral-decay plot (fig.8).

The Focal Aria 936's measured performance would not be out of place in an expensive loudspeaker. Considering that it costs just $3999/pair makes it an extraordinary value.—**John Atkinson**

in the Flat (or bypass) position. Bass, midrange, and treble were all present in a well-balanced way, with no part of the audioband jumping out at me or sounding too muted.

One thing the Aria 936 was *not* was "bright." I mention this specifically because, in my occasional browsing of Internet audio forums, I've encountered the statement that "Focal speakers tend to be bright." Based on my experience with the Aria 936, and with the earlier Chorus 826W, I must disagree. Extended highs, transparent to the tonal characteristics of the recording and of the associated equipment—yes. But from what I've been able to determine, the Aria 936 did not add significant brightness of its own. I can certainly imagine that with a cheap-and-not-so-cheerful amplifier, and a particularly "digital"-sounding source, the resulting sound could be brighter than ideal. I preferred to set my Ayre Acoustics CX-7e^{MP} CD player to its Listen rather than its Measure filter—but then, that was my preference with other speakers as well. And while there were differences in the sound depending on whether the electronics were the solid-state Simaudio Moon pair or the tubed CAT and McIntosh, in neither case could the sound be described as too bright—or too soft, for that matter. Vocal sibilants are, for me, the most telling indicators of exaggerated treble—a "spitty" character that I find very annoying. However, the treble of the Aria 936 was clean and extended but not overly bright, with no emphasis added to sibilants—a tribute to the design of Focal's new tweeter.

I noted earlier that one of my reasons for choosing the Aria 936 over the smaller Aria 926 was that the 936 has an additional woofer and a claimed bass extension to 32Hz, or 5Hz lower than the 926. I was concerned that the bass might be too much for my room, but that wasn't a problem. (The pair of ASC Bass Traps in the front corners probably helped in this respect.) The bass sounded extended—not quite as low or as room-filling as the GoldenEar Triton Twos, but at least comparable to the PSB Imagine T2s. The Aria 936 went low enough to pass my usual low-frequency test—the 32Hz synthesizer note at the beginning of "Temple Caves," from Mickey Hart's *Planet Drum* (CD, Rykodisc RCD 10206)—with maybe a bit more assurance than the PSBs. Double basses, bowed or plucked, were firm, not weak or exaggerated, and no obvious unevenness manifested throughout the instrument's range.

Colorations—a speaker drawing attention to the fact that the sounds heard are not being made by musicians playing instruments in the room but are emanating from a box and result from vibrations produced by transducers—are endemic to loudspeakers, and controlling them represents perhaps the greatest challenge in speaker design. The Aria 936 did exceptionally well in this department, mixing very little "speaker sound" in with the music. For the most part, I found it easy to pretend that the sounds in my

CONFOUNDING, CABLES, AND ROOM ACOUSTICS

IN DESIGNING AN EXPERIMENT, one of the essential requirements is the avoidance of confounding. If you want to determine the effect of a single variable, you must change only that variable, and keep everything else constant. If you change more than one variable (unless it's part of a more complexly designed, multivariable experiment), then any differences in outcome may be due not to the variable of interest, but to the other, confounded variables.

This concept is relevant not only to scientific research but to conclusions drawn from everyday observations. A typical example in audio involves listening to a system featuring a particular speaker in one room at an audio show, then listening to another speaker in another system in another room. If your focus is on speakers, it's tempting to attribute any sonic differences to the speakers, but the comparison is rife with confounding. Unless the two systems use exactly the same components, each component is a confounded variable—as are the rooms, the acoustical treatments (if any) in each room, the positions of the speakers, the position of the listener in the room, the amount of time each system component has had to break in/warm up, the number of people in each room, and a variety of psychological factors, including the listener's mood and level of aural fatigue (the latter an important factor of show conditions), etc. It is in consideration of these potential confounding factors that I tend to be cautious about drawing conclusions about the sound of specific audio components at shows.

While the methodology used in the subjective reviews of audio gear may not satisfy the most rigorous scientific criteria, I think most reviewers do their best to ensure that their conclusions represent the sound of the component being reviewed, and not the result of a failure to eliminate confounding. Whenever I get a new component to review, I make it a point to keep the rest of the system the same. But sometimes there are obstacles to this practice. If the component is a speaker, the designer or marketing rep may want to send me cables that they've found work particularly well with that speaker. I can appreciate that they want their product to sound its best, but changing the cables involves obvious confounding. Of course, I could listen to the speakers with my usual cables as well as the ones the speaker designer recommends, but I'd then be reviewing the cables as well as the speakers, and I don't want to go down that road. Unless there are solid technical reasons for not using my usual cables—*eg*, the speakers need to see a specific characteristic cable impedance—I prefer to stay with cables whose sound is familiar to me.

For several years now, I've standardized on Nordost Valhalla speaker cables, interconnects, and power cables.

Robert Deutsch's renovated listening room.

a bit less ultimate transparency than the CAT/McIntosh duo, the Focal/PrimaLuna pairing is one I could live with quite comfortably. I'm not experienced with solid-state integrated amps at about the $2000 price point, but a perusal of the most recent edition of *Stereophile*'s "Recommended Components" and talking to a good dealer should help to identify some likely contenders.

Conclusions

"A big, spacious sound, tonally neutral, with impressive dynamics, and powerful bass for the size of the speaker." That was my capsule description of the sound of Focal's Chorus 826W 30th Anniversary, and it also describes the Aria 936, which is all of those things—and more. As befits its somewhat larger size and additional woofer, the Aria 936 reaches further down into the bass, without the bass sounding boomy or bloated. No longer having samples of the Chorus 826W on hand for comparison, and thus having to rely on my memory and listening notes, I may be on thin ice here, but I'm comfortable saying that the sound of the Aria 936 is more detailed and more transparent, and its highs are particularly clear and extended without sounding in any way forward or clinical. Soundstages are bigger, and aural images within those soundstages are more precisely defined.

The word *voice* has long been associated with the reproduction of music, going back to His Master's Voice, Electro-Voice, and Altec's Voice of the Theater. It is thus most appropriate that Focal has named their newest line of speakers Aria, a term that refers to vocal music. With the right source and suitable partnering electronics, the Aria 936 sings with a beautiful voice. ■

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