Cabasse
La Sphère
POWERED LOUDSPEAKER

Michael Fremer

DESCRIPTION Four-way, floorstanding, full-range active loudspeaker. Drive-units: 1.1" (28mm) dome polyether tweeter, 4" (100mm) annular midrange, 8" (210mm) Duocell annular low-midrange, 22" (550mm) woofer. Crossover frequencies: 150Hz, 800Hz, 4kHz. Frequency response: 20Hz–25kHz, ±3dB. Sensitivities: 93dB (tweeter, midrange), 94dB (low-midrange), 96dB (woofer). Nominal impedance: not specified. Power handling: 30W (tweeter), 80W (midrange), 170W (low-midrange), 1kW (woofer). Fully balanced, class-D ICE monoblock power amplifiers: four 300W (tweeters, midranges), four 1kW (low-midranges, woofers).
DIMENSIONS 55.1" (1410mm) H by 27.6" (700mm) W by 27.6" (700mm) D. Weight: 220 lbs (100kg).
FINISHES Pearl gray, pearl black, other finishes possible.
SERIAL NUMBERS OF UNITS REVIEWED not noted.
PRICE Two speakers with stands, outboard active crossover with DSP processor, $140,000; with eight channels of ICE amplification, $165,000. Approximate number of dealers: 40. Warranty: 5 years, drivers.
MANUFACTURER Cabasse SA, 210 rue René Descartes, BP 10-29280 Plouzané, France. Tel: (33) (0)2 98 05 88 88. Fax: (33) (0)2 98 05 88 99. Web: www.cabasse.com. US distributor: St. John Group, 4396 Saddlestone Drive, Bellingham, WA 98226. Tel: (360) 756-2205. Fax: (360) 647-1087. Web: www.cabasse-usa.com, www.stjohngroup.com.

Cabasse La Sphère powered loudspeaker

In an unfortunate coincidence, a few nights before the Cabasse team arrived to install the company's unusual-looking La Sphère powered speaker system, VOOM HD Networks, Monster HD channel, which is exclusively devoted to B horror movies, broadcast *The Crawling Eye* (aka *The Trollenberg Terror*), a 1958 black-and-white howler starring Forrest Tucker. I watched.

Uncrated, and minus the cold fog, the large, accurately named Sphères bore more than a passing resemblance to that flick's crawling-eye monsters. Indeed, the Cabasses' unusual presence in my listening room creeped out more than a few visitors. The ones who didn't recoil—count me among them—embraced the speaker's retro sci-fi looks.

Construction in the Round

The Sphère's startlingly large spherical enclosure is made of dual shells of thin, rigid polymer separated by a layer of damping material that Christophe Cabasse, son of the French firm's founder, Georges Cabasse, told me is extensively used in the aeronautical industry, as well as to damp submarine interiors. It contains a acoustic-suspension woofer with a 22" cone made from ultrarigid, lightweight Nomex honeycomb. Inside, the sphere is further stiffened with curved wood braces, then covered in a thick layer of acoustical felt.

Within a highly damped composite "lens," the ball's curved front surface holds

the three-way TC23 module, which covers the range of 80Hz to 22kHz and comprises the convex midbass and midrange drivers, and a dome tweeter mated to a flared horn. The TC23 is an upgrade of the TC22 coaxial driver used in many Cabasse products, including the Artis Baltic II, which I reviewed in the September 2005 *Stereophile* (Vol.28 No.9). As I wrote in that review, the coaxial's exploded diagram demonstrates that it's "not simply three nested drivers but a complex jigsaw puzzle of them." The TC23's updated tweeter is made of a new generation of polyether said to incorporate an ideal ratio of rigidity to weight that better matches the performance of the midrange driver. The 8"-diameter low-midrange unit, with a ring-shaped Duocell diaphragm of Rohacell foam, has been redesigned and now has a longer throw.

With this four-way composite drive-unit, Cabasse appears to have produced as close to a full-range, coincident point-source loudspeaker as is physically possible while avoiding the usual problems of reflection, diffraction, and comb filtering associated with placing a mid/high-frequency driver in front of a woofer. Still, the Sphère's drivers are arranged one in front of the other, the new woofer placed behind the low-midrange/high-frequency array.

While a single full-range driver would be ideal, it's simply not possible. This forces the designer to choose between producing frequency-limited, single-driver speakers, which almost always sound very coherent while reproducing flutes and such, but are more or less useless at the frequency and dynamic extremes—or multidriver, full-range speakers, which all suffer, to one degree or another, from tonal and spatial incoherence due to com-

MEASUREMENTS

The Cabasse La Sphère is bulky enough,[1] heavy enough, and, with its need for quad-amplification, complicated enough that I felt that, rather than have the loudspeaker shipped to my lab for measurement, I would travel to *it*. So I paid a visit to Mikey's listening room to take the measurements, which also allowed me to give it a listen. I was very impressed by the speaker when I auditioned it at the 2007 Consumer Electronics Show, thinking it had a delicacy that belied its bulk (see http://blog.stereophile.com/ces2007/010907cabasse), and I heard much of what Mikey described in his auditioning comments.

Rather than my usual speaker-measuring setup, DRA Labs' MLSSA, which is tied to a desktop PC, I used SMUG Software's Fuzzmeasure program running on my Mac laptop, in conjunction with an EarthWorks omni mike and a Metric Halo ULN-2 FireWire sound processor. Like MLSSA, Fuzzmeasure allows the user to "gate" a loudspeaker's measured impulse response to produce, using FFT analysis, an anechoic response; but rather than MLSSA's MLS signal, Fuzzmeasure uses a "chirp" signal. I have previously compared both measuring systems; with gate and FFT parameters set identically, and with the microphone at precisely the same point in space in front of a loudspeaker, they produce identical measured responses, as you might expect.

As I understand the Sphère is fundamentally an active system, it wasn't appropriate to measure voltage sensitivity or impedance. Therefore, the first measurement I discuss here is the speaker's impulse response, taken on the tweeter axis at 1m. (Because I measured the speaker in MF's listening room, with room furnishings and boundaries present, I had to get closer to the speaker than is optimal for the measurements.) Fuzzmeasure has an operational mode that allows the user to compensate for the time it takes the DAC feeding the amplifier with the test signal and the ADC operating on the measurement-mike signal to perform their conversions. Even so, if you look at the horizontal scale of the measured impulse response (fig.1), you can see that the impulse arrives at the microphone between 13 and 14 milliseconds after leaving the loudspeaker. Because sound travels about 13" in 1ms, this result implies that the microphone was more than four times farther away from the loudspeaker than 1m.

The difference arises from the fact that the Sphère has a digital crossover, with its own A/D and D/A converters. The extra 10ms is the crossover's "latency"—*ie*, the time it takes to process the signal—and is equivalent to moving the speakers back by 9' or so. This time delay is small enough not to be an issue if the Sphère

1 Its 28" diameter will not fit through the door to my test lab, for example.

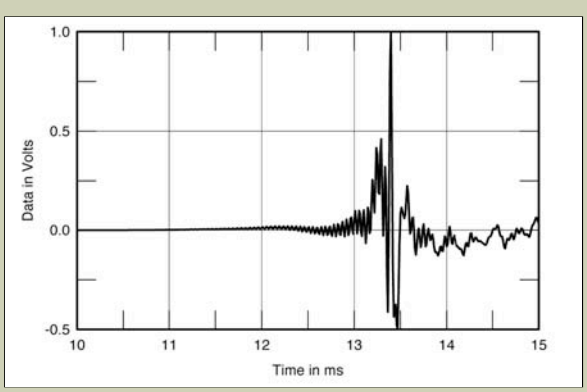

Fig.1 Cabasse La Sphère, impulse response on tweeter axis at 1m (5ms time window, 30kHz bandwidth).

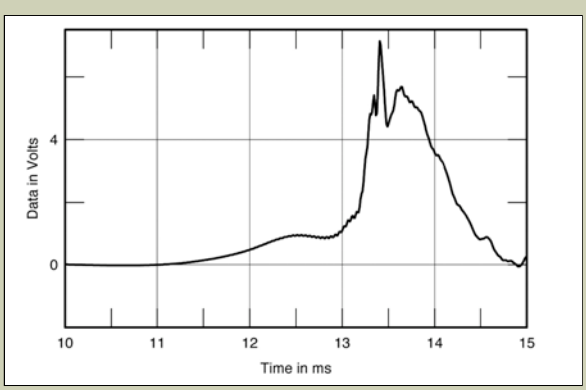

Fig.2 Cabasse La Sphère, step response on tweeter axis at 1m (5ms time window, 30kHz bandwidth).

promises that must be made in driver placement and/or crossover network, and the resultant inconsistencies in time delay. Most of us listen to examples of the latter, among which are many speakers that prove that such a system can be made to work quite effectively. Still, these problems are difficult to design around, and affect both direct and reflected off-axis energy. It's the balance a designer strikes between them that is critical to achieving timbral and spatial accuracy.

In the Sphère, Cabasse claims to have produced at least part of that ideal driver: a pulsing sphere. Even the Sphère's asymmetrical, diffraction-avoiding stand plays a part in the speaker's sound. It provides a rigid, vibration-free support for the sphere, and also gives it a sexy, "futuristic" look.

Solving the physical aspect of the composite drive-unit's design still leaves the issues of crossover phase and time delay. For that, Cabasse developed a proprietary active digital crossover combined with a powerful DSP chip. The software, jointly developed over three years by Cabasse and ENST Bretagne, a graduate engineering school and information-technology research center based in Brittany, resulted in the issuance of several patents and three AES presentations on digital sound treatment and coaxial drivers. Cabasse then worked with the American company DANVIL Signal Processing, which produced a special version of one of their soundcards to meet the needs of the Sphère.

In simple language that even I can understand: The crossover-processor corrects, in the digital domain, the time delay inherent in the horizontal stacking of the point-source array, while using four linear-phase digital filters combined with the appropriate time-align-

is used to play back video soundtracks.

Fig.2 shows the Sphère's step response, calculated from the impulse-response data. Though there is a sharp rise just after the 13ms mark, some lower-frequency energy arrives before that time, and the shape only roughly resembles the right triangle that would indicate a time-coincident design. I therefore examined the step responses of the individual drive-units, again on the tweeter axis at 1m. These are shown in fig.3. The black trace is the woofer's output: positive-going, it starts to slowly rise above the time axis just before the 11ms mark. (The crossover's low-pass filter necessarily slows its risetime—talk of "fast" woofers[2] always ignores this fact.) The low-midrange unit's step is the blue trace; the upper-midrange unit's is the green trace. The steps of both are initially negative-going, but the bulk of the energy is on the positive side of the time axis and arrives at approximately the same time as that of the woofer's maximum. The tweeter's step is the red trace—the pre-ringing is presumably the residual effect of the Finite Impulse Response (FIR) high-pass filter, and the positive peak arrives just a little too late to sharpen the speaker's overall step. While this may well not matter subjectively, evident in the decay of the tweeter's and the midrange unit's step responses is some ringing that might well do so. (Both the filter's pre-ringing and the tweeter's post-impulse ringing can also be seen in the impulse response, fig.1.)

Turning to the frequency domain, fig.4 shows the individual drive-unit outputs, again measured on the tweeter axis at 1m. Again, the woofer's output is shown in black, the low-midrange unit's in blue, the midrange unit's in green, and the tweeter's in red. The outputs of the low-midrange unit below 500Hz and the woofer below 300Hz were taken in the nearfield. The relative levels of the four units were as set by designer Christophe Cabasse when he set up the speakers in MF's room. The tweeter appears to have been set around 3dB too low in level—I am sure this contributed to MF's finding the sound a little dark—and the steep rolloff above 22kHz is due to the fact that the digital crossover's A/D converter operates at 48kHz. I suspect that the designer felt that higher conversion precision could be obtained by running the converter at 48kHz rather than at, say, 96kHz.

The crossover's digital-filter slopes can be seen to be very steep, with very little overlap of the three upper-frequency drive-unit outputs. The low-midrange unit hands

2 Audiophiles are actually talking about the Q of the woofer tuning when they use this terminology. A "fast" woofer has the same slow risetime as a "slow" woofer, but doesn't ring as long following a transient.

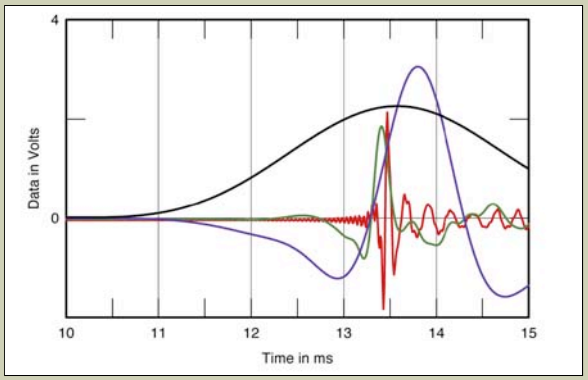

Fig.3 Cabasse La Sphère, step responses of: tweeter (red), upper-midrange unit (green), low-midrange unit (blue), and woofer (black), all on tweeter axis at 1m (5ms time window, 30kHz bandwidth).

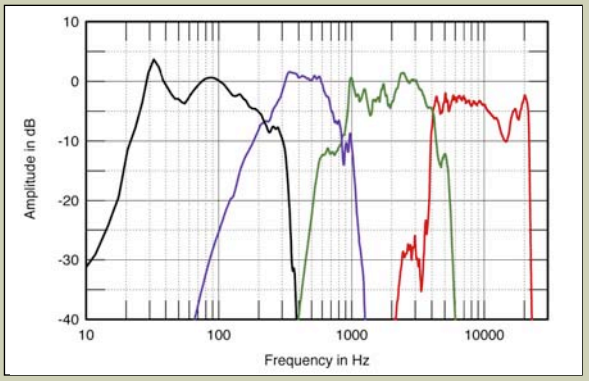

Fig.4 Cabasse La Sphère, quasi-anechoic responses on tweeter axis at 1m of: tweeter (red), upper-midrange unit (green), low-midrange unit (blue), woofer (black).

ing delay filters to carefully limit the response of each transducer's operating range. The system was further optimized by Cabasse to optimize the off-axis radiation pattern. To smooth the amplitude response, it also includes a linear-phase, digital-domain equalizer.

While digital-domain crossovers permit the implementation of steep slopes without the usual tradeoffs of analog crossovers, Cabasse's research has demonstrated that this approach is not necessarily ideal for coaxial drivers, in which lobing does not occur in the overlapping frequencies. The result, according to their literature, is a speaker whose polar pattern response is remarkably smooth, consistent, and controlled. Cabasse claims that the response will fall within 2dB of the Sphère's specified on-axis frequency response of 20Hz–25kHz, ±3dB (open space conditions) within a 60° cone centered on the tweeter.

A block diagram shows that the analog input is first digitized at 24-bit/48kHz resolution by an Analog Devices AD1938 analog-to-digital converter. The digital audio data are then equalized, after which it is fed to a digital filter bank that implements the necessary time alignment of the four acoustic centers and the crossover networks. The crossover points are 150Hz, 800Hz, and 4kHz, with variable-slope filters ranging from 24 to 70dB/octave. Digital signal processing is accomplished via an Analog Devices 32-bit floating-point SHARC chip, with D/A conversion for each of the four drive-unit channels handled by an AD1938 chip. The speaker needs to be quad-amplified.

$140,000 gets you the two speakers, the outboard active crossover and DSP processor, and installation, including computer-coordinated custom room correction. While you have the option of using enough separate, non-Cabasse amplifiers to achieve the required eight channels of power, Cabasse strongly recommends its own Bel Canto–sourced power package, comprising eight fully balanced ICE-powered digital monoblock amplifiers: four 1kW bass/midbass amps and four 300-watters for the midrange drivers and tweeters. That's 5200W for $25,000, and a *total* package price of $165,000.

You'll also need four pairs of balanced interconnects between the processor and the monoblocks, *and* four pairs of loudspeaker cables.

Easy Installation

Carrying the Sphères, which come with their stands pre-installed, was an easy two-man job. Thanks to Cabasse's room correction, placing the speakers wasn't quite as critical as it usually is in my room. The pair ended up where most speakers sound good here: 8' from my listening chair, 2–3' from the front and sidewalls, and about 8' apart. Christophe Cabasse flew in for the installation, and while there's no guarantee he'll do the same for you, *someone* highly qualified by Cabasse to do the job *will*.

Once the speakers, the crossover, and the stack of amps were in place, it was time to wire them all up. Cabasse had been using Monster Cable at public showings, but because the Sphère is internally wired with Kimber Kable, they decided to supply me with a full array of Kimber Select interconnects and speaker cables.

When everything was connected and powered up, Monsieur Cabasse first made several measurements of the woofers alone, to understand the effect of

measurements, *continued*

over to the upper-midrange unit between 800 and 900Hz, while the tweeter takes over above 4kHz. However, the crossover from the low-midrange unit to the woofer appears to feature asymmetrical acoustic slopes and a degree of overlap. As set, the woofer's output peaks at 32Hz before starting a steep rolloff with a third-order slope, rather than the expected second-order slope from the sealed-box tuning. The upper-frequency drive-units are generally well behaved in their passbands. I did initially suspect that the peaks and dips in the upper-midrange unit's response were due to room reflections, but they are actually due to diffraction from the openings for the 22" woofer.

I haven't shown the Sphère's overall response at 1m, but I have shown the spatially averaged response (fig.5). To produce this graph, I averaged 40 measurements taken for each speaker individually in a rectangular grid centered on the position of Mikey's ears in his listening seat. The spatial averaging reduces the effect of room resonances; I have found that this technique's integration of the on-axis response with the room's reverberant field—which is strongly influenced by the speaker's power response—gives a good correlation between the shape of the graph and the perceived balance. The large peak at 32Hz stems both from the woofer's intrinsic response and from the close-to-the-corner room placement, the latter maximally exciting what I assume is the lowest-frequency diagonal room mode. The Sphère's low bass did sound heavy and powerful when I listened to the speakers. Higher in frequency, the middle of the midrange is a little hot and the tweeter is slightly shelved down. But other than those characteristics, the Cabasse speaker's room response is generally smooth.

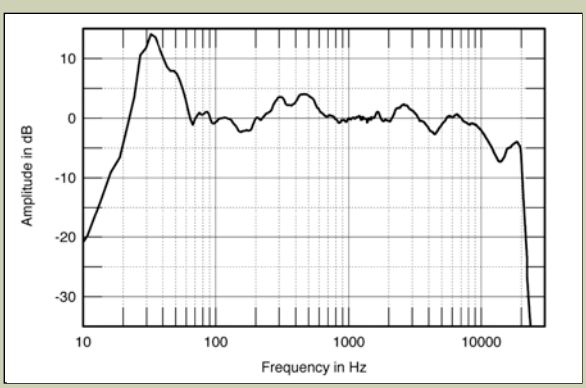

Fig.5 Cabasse La Sphère, spatially averaged, ⅛-octave response in MF's listening room.

Without my being able to measure the Cabasse La Sphère in my lab, its measured performance in Mikey's room unfortunately leaves some questions unanswered. But overall, it seems a well-engineered design. I'm not surprised Mikey liked it as much as he did.

—John Atkinson

LF room modes. Then he placed a microphone at my listening position and, using a test tone, measured each channel's response. He looked at the resulting curves and pronounced the room's response excellent, in need of only minor correction—although with a pair of 22" woofers in close proximity to the front and sidewalls, there was, of course, the usual exaggeration of low-frequency response due to boundary reinforcement.

While I did other things, Cabasse played with various fixes for the better part of an hour before choosing one. When I listened and felt the bottom end still too prominent, he went back to work, and produced another solution that was somewhat less pronounced in the very low frequencies.

When I looked at the screen of his laptop to see the final curve, I was impressed by its smooth midrange, its extended and reasonably flat bass response (taking into account the boost from the speakers' proximity to the walls), and its non-peaky treble, even if the trace in the graph sloped slightly downward from bottom to top. Throughout the two months I listened to the Sphère, its overall balance always struck me as slightly on the warm, mellow side of neutral, this associated both with the bass boost and the downward slope of the response curve at increasing frequencies.

However, Cabasse insisted that such a curve was his preferred in-room response. He also felt, and I concurred, that the sound was somewhat disappointing—the music seemed to cling to the Sphères instead of floating free of them. This wasn't what I'd heard at shows, and not what Cabasse himself had become accustomed to. We listened for a while that way, and believe me, it didn't suck. It just wasn't as open and as expansive as I would have liked.

I then substituted my reference preamp-to-amp interconnect, the TARA Labs Zero, for the Kimber Select. Sure enough, the sound opened up considerably. Was TARA willing to supply four pairs of their Omega Gold speaker cables and four pairs of Zero balanced interconnect? They were, though it took them a few weeks to produce and ship the Omegas. That was fine with me; it was only fair to give the Kimbers time to break in, and eventually they did—the sound opened up, particularly on top. But when, after a few weeks, I replaced them with the TARA Omega Golds, the immediate result was a sound that was notably more open, expansive, fast, and extended on top—all things that the Sphères needed. All of my comments on the Sphère's sound are with the TARA cables.

So—to $165,000, add another $100,000 for the four pairs of speaker cables and balanced interconnects, for a grand total of $265,000—and that's just for the amps and speakers and the wire to hook them up with. Preamp and source components and *their* wires are extra.

At a time when the US economy is sliding into the toilet and tens of thousands of Americans are losing their foreclosed-on homes, spending over a quarter of a million bucks just to hear some music is disgusting, disgraceful, decadent, grotesquely indulgent, well off the Bad Taste chart, and blah blah blah. But even with a robust economy, zero unemployment, and free healthcare for all, spending $265,000 to play some music would still be all of the above. And there is still, and will probably always be, a waiting list for Ferraris. Some people will continue to fetishize and wear obscenely priced wristwatches the size of satellite dishes. The good life goes on for the terminally well-off, of whom surely some read *Stereophile*. Please, the rest of you, indulge your imaginations and hold your envy in check for a few more pages, just as the readers of auto magazines do. Even if you can't afford the car, try to enjoy the ride.

Cabasse supplies optional amplification in the form of 8 monoblocks, as well as the digital crossover.

The big D in the room

To say that the Cabasse La Sphère system is not for analog purists is an understatement. If, for you, purity comes before performance, you would never want the Sphère, no matter how good it sounded. Not only is it "digital," but its resolution of 24 bits/48kHz, bandwidth-limited to 22kHz is relatively low. How many SACD enthusiasts want to redigitize the analog conversion from DSD at 24/48? How many CD enthusiasts will want to redigitize their CD players' analog output, even if the Sphère's resampling frequency and bit depth are greater than the original? And regardless of the resolution, how many vinyl enthusiasts will be willing to convert their vinyl to digital *at all?* I know what you're thinking: In addition to the analog input on the Sphère's crossover module, couldn't a digital one have been included, along with a high-quality volume control? Perhaps Christophe Cabasse's "Manufacturer's Comment" will provide an answer.

Then there's the Sphère's class-D ICE amplification, which, while not "digital" per se, uses pulse-width modulation and a lot of feedback. And finally, why not run the A/D converter at at least 24/96 or, better yet, 24/192, which chipmaker Analog Devices says is indeed possible? Again, perhaps Cabasse will comment on these questions; for now, I suspect it's a matter of the limits of processing power.

It sure sounded different

Though the Sphères were then still in development, their rendering a few years ago of a CD-R I'd made of "Tin Pan Alley," from Stevie Ray Vaughan's *Couldn't Stand the Weather* (LP, Columbia/Pure Pleasure), was among the more memorable listening experiences I've had at a Consumer Electronics Show since I began attending in 1978. My hope was for a similar experience at home with the finished version.

It's impossible to separate from the Sphère's overall performance the individual contributions of the processor, amplifiers, and speakers. The only question really worth answering is *How does it all sound?* Given the claims Cabasse makes in its literature for the Sphère's performance, and the speaker's staggering price, the first time you plop yourself down in front of a pair of them, the experience should not only be staggeringly *different* from anything you've ever heard before, but, at least in some ways, *better.*

That's what happened to me. On an enormously wide and—especially—*deep* soundstage, the Sphères produced the most stable and solidly three-dimensional images I've ever heard, in my room or anywhere else. These images hung convincingly suspended in space with almost alarming solidity—it was like looking at scenes through a View-Master. At least in

that respect, the Sphères *did* sound fundamentally different from and better than anything else I've heard. It was like moving from widescreen CinemaScope to triple-projector 3D Cinerama. The Sphères traded the usual pinpoint "sweet spot" for an area the size of a candy factory, over which soundstaging, imaging, and instrumental timbres remained fundamentally unchanged (although, in my relatively small room, the low-frequency balance did vary off axis).

But even more than startlingly superior staging and imaging, the harmonic structure of instruments also sounded more correct, more coherent, more lifelike than I am used to. And this was with digitized vinyl. Digititis, grain, etch, edge, and every other quality of CD sound that repels so many, were simply not evident in the sound of this system, which operates wholly in the digital domain. The organization of the time element resulted in unprecedented ease of listening—the sense of musical relaxation I usually associate with live music.

With every familiar LP I played during the months the Sphères were in my room, the absence of time and phase artifacts, combined with amplitude correction that resulted in a subjectively near-flat frequency response in the critical midrange, was the sonic equivalent of finally getting in sharp focus a long, blurry, smeared panoramic photo.

From familiar recordings there were always surprises, and often new information, to be heard. More important, there was a continuous sense of "rightness" about the overall sound. Last night I put on the oft-reviled Mobile Fidelity edition of the Rolling Stones' *Sticky Fingers* (LP, Rolling Stones/Atlantic/Mobile Fidelity Sound Lab). "Brown Sugar" had never sounded this convincing. This usually mushy-sounding mix is not a great recording to begin with, but never had Bobby Keyes' tenor sax been rendered with such reedy pungency and evenhanded clarity. Each instrument was rendered with greater individual clarity and precision than ever before in my experience, and by a wide margin.

Everyone complains about the hyped-up, out-of-control bass and sizzly top end on "Can't You Hear Me Knockin'," also from this MoFi edition. Not so through the Sphère, which was essentially flat down to 20Hz (or to at least 30Hz in my room). If the Cabasse didn't measure *absolutely* flat in my somewhat confined space, it sure sounded it, despite what I knew about the speaker's low-frequency boundary-proximity bump.

The bass on this supposedly boomy track was unbelievably deep and tight, well-controlled and -timed. Because of all that, the excess bass was less noticeable than through many speakers of more limited range through which I've played this track. Cymbals rang out solidly, convincingly bright and physically present, with attacks that were credibly fast and clean but never hard or bright or "crispy" (best for potato chips, not sound). Pushed to +100dB, the Cabasses gripped in their iron fists everything in the mix, rendering it with unprecedented precision and coherence. Each element of the mix, including Mick Jagger's vocal, was reproduced with remarkable solidity.

But while ruthlessly revealing, the Cabasse Sphère was also self-effacing. On LP or CD, well-recorded solo acoustic piano—for instance, the recent reissue of Robert Silverman's recording of Rachmaninoff's two piano sonatas (CD, Stereophile STPH019-2)—never suffered from leading-edge crispness or overaggressive attack, nor did it sound mushy and indistinct.

I hope you've been lucky enough to hear, from a good seat in a good hall, a solo-piano recital on a good instrument. If you have, you know that the piano never sounds tinkly or tinny, though it can sound (coherently) bright when pushed. It has a velvety, rich, woody sound that isn't soft or muffled, and certain notes don't randomly jump out at you. It's probably the most difficult instrument to record accurately.

Silverman's analog recording of Rachmaninoff's Sonata 1 got it more or less correct, as did the Cabasse Sphères. Each note's attack had a physical presence that was distinct yet liquid. I could feel the finger pressure on the key and the hammer's response, followed by the reverberation of the sounding board. Each note seemed wrapped in a velvety caress that made it sound and *feel* like a piano instead of an electronic rendering of one.

I have sampled (no pun intended) Artur Rubinstein's set of Chopin's *8 Polonaises, 4 Impromptus* (LP, RCA Living Stereo LSC-7037) many times over the years, but never until the Cabasse La Sphères have I sat down and listened straight through all four sides. This set, recorded at Carnegie Hall, had never before sounded so cleanly or solidly rendered, or as intimate. The distinction between the direct sound of the piano and the reflected hall sound was never so cleanly laid out or pronounced. The piano never sounded as solid, dimensional, and harmonically complete. The brief lags between the direct sound of the notes and their reflections had never sounded as cleanly organized, nor has the picture sounded as three-dimensionally complete.

Better piano recordings sounded more convincing than I'd ever heard them at home. But if you're used to crisp, tinkly leading edges and false "air," such recordings can sound dark and unimpressive—especially if you're unaccustomed to hearing solo-piano recitals in person.

The Sphères and their 5200W of power produced unlimited expression at both ends of the dynamic scale, and sounded equally convincing whether played at excruciatingly loud or very low levels.

Why do original vinyl recordings converted to digital and back still sound better than CDs put through the same process? I don't have the answers. I just know that I and everyone who listened to the Sphères in my room came to the same conclusion. And no one, myself included, heard anything "digital" about the Sphère's rendering of analog sources, even though we'd all heard how the system could produce ultrasolid, three-dimensional images that were markedly superior and better-organized that anything heard previously here—or pretty much anywhere else.

And yet...

Though much was spectacular, and in many ways vastly superior to anything else I've experienced at home, not all was perfect in the microprocessor-controlled digital world of the Cabasse La Sphère. Regardless of the recording, or whether the source was LP, CD, SACD, or a live eight-track analog recording I helped a friend mix down, the way the Sphère's digital processing dealt with fast vocal transients revealed itself as a suspicious sameness that intruded on hard sibilants. That was the one overt way in which the extreme signal processing the Sphère uses to set things right (or the A/D conversion) showed its seams. There were other, more subtle ones.

My wife, in whose ears I trust, came down for a first listen. Without knowing anything about the digitization and heavy processing the Sphères were doing, she heard Fleetwood Mac's familiar "Station Man," from *Kiln House* (LP, Warner Bros.), and said, "I don't like it. It

sounds processed. It sounds dark and mushy and everything is back *there*." As the tune continued and her ears adjusted, she heard all of the Sphères' tremendous organizational skills and ability to retrieve real detail, which can only be heard by listening "in" to the presentation as opposed to having them dumped in your lap by brightness and leading-edge accentuation. She came to appreciate all that, but still felt the overall presentation sounded "processy."

I, Mr. Analog, was somehow less bothered by that, and more irked over time by a feeling that, in his quest for near-perfect response characteristics and the Sphère's other considerable achievements, Christophe Cabasse had sacrificed both resolution and high-frequency air and delicacy. Recordings I've known for years to be bright and have tape hiss sounded smooth and hissless. That told me that the system's high-frequency response was rolled off, or simply cut off by the limitations of 48kHz digital. Can I still hear beyond 22kHz? I doubt it—but what happened to the hiss, and some of the attractive sparkle, on those familiar records?

After hearing the tune for more than 30 years on many great systems, when I played Roxy Music's "Do the Strand," from *For Your Pleasure* (LP, Island), the Sphère's ability to lay it all out with complete control—especially Andy MacKay's sax part—was absolutely stunning. Yet, as astonishing as it was, there *was* a "processy" quality to the sound, particularly singer Bryan Ferry's sibilants, and to some degree the organization came at the expense of high-frequency air and extension. Other familiar albums, such as Buffalo Springfield's *Last Time Around* (LP, Atco SD33-256), which had always sounded open and exciting, now sounded closed-in. While some records revealed heretofore unknown star qualities of sound, and others that had always sounded great continued to do so, still others were big disappointments—as if the Sphères' signal processing just didn't like something about the recording.

Spatially, while the system projected as far back into the soundfield as I've heard, nothing—despite the measurements cited in Cabasse's white papers—seemed to extend forward of the plane described by the fronts of the speakers. That contributed to the sense of mush and the lack of drama or surprise, and ultimately elicited from me a response to the Sphères' sonic achievements that was more intellectually than viscerally stimulating.

I was more aware of this tradeoff when listening to analog sources than to "Red Book" CDs (and in that case I was grateful for it). But I spent many nights listening to LPs straight through, almost till dawn, transfixed by what the Cabasse system was revealing about many very familiar records, most of which it transformed in positive ways.

As I said, it's impossible to separate out the contributions made by the speakers, the processor, and the ICE amps. I've heard, however, that ICE amps in general can sound smooth and dark. The Sphère's tonal balance *did* sound smooth, dark, and starved of air, although part of that surely must have been the boundary-proximity bump—there *was* too much bass, though not of the obtrusively boomy variety.

Conclusion

Lest I leave you with the wrong impression, the two months I spent with Cabasse's La Sphère were among the most exciting and enjoyable I have experienced as an audio reviewer. The speaker is an amazing achievement.

The system delivered the sonic ride you'd expect and demand for so great an investment: full audible frequency response, full dynamic range, rich detail. And having heard it in a very large space at Shows, I can assure you that the Sphères are capable of delivering all the goods there as well as in my sorry little room. In a big, open room they sound positively magnificent, and far more open and expansive than my room permits.

In terms of organizational skills, timing and phase coherence, and timbral and textural accuracy, Cabasse's La Sphère system sets new sonic standards. Its reproduction of the piano and the human voice is light-years ahead of anything else in my experience. Its ability to produce solid, three-dimensional images on a stable, remarkably well-organized soundstage also beats anything I have ever experienced anywhere, and by a considerable margin. And in terms of textural solidity, harmonic structure, overall control, and low-end extension, its bass performance is similarly unprecedented.

But as set up in my room, the Sphère didn't produce the air and shimmering high-frequency extension that can be found in the grooves of many LPs and SACDs, and that are not recording artifacts. (If your listening is limited to CDs, this won't be an issue.) And the Sphères' failure to push their soundstage in front of themselves, whether more accurate or not, somewhat reduced their visceral impact, producing an experience that involved the head more than the heart. Finally, there's that issue of "processiness." A lot of processing goes on within the Sphère system, and unless CD is your only source, 48kHz is a barely sufficient sampling rate. With the exception of vocal sibilants, this processing wasn't grossly audible per se, but it certainly affected the system's ability to sound *real*, as opposed to sounding really great.

It comes down to the usual balancing act: Is what's achieved worth the cost? But by *cost*, I don't mean dollars. The best part of a system such as the Sphère is that software upgrades are easy to make. I would assume that, should a faster, higher-resolution processor come along—say, 24-bit/192kHz—or even just some improved software, a box swap or software upgrade should be possible.

That said, I feel comfortable asserting that, as currently configured, the very expensive, unusual-looking La Sphère sets new standards, both measurable and audible, for accuracy in the reproduction of music. I hope you get to experience it for yourself.

ASSOCIATED EQUIPMENT

ANALOG SOURCES Continuum Audio Labs: Caliburn turntable, Cobra tonearm, Castellon stand; Graham Phantom tonearm; Ortofon Windfeld, Einstein TU3, Air Tight PC-1, Lyra Titan *i* cartridges.
DIGITAL SOURCES Musical Fidelity kW SACD player, BPT-modified Alesis Masterlink hard-disk recorder.
PREAMPLIFICATION Manley Steelhead, Einstein Turntable's Choice, Nagra VPS phono preamplifiers; Musical Fidelity kWP, DartZeel NHB-18NS preamplifiers.
LOUDSPEAKERS Wilson Audio Specialties MAXX 2.
CABLES Interconnect: Kimber Kable Select, TARA Labs Zero. Speaker: Kimber Kable Select, TARA Labs Omega Gold. AC: TARA Labs The One, Cobalt AC, Shunyata Research Anaconda Helix.
ACCESSORIES Shunyata Research V-Ray Reference power conditioner; Oyaide AC wall box & receptacles; Audiodharma Cable Cooker; Furutech DeMag & deStat; Finite Elemente Pagode stands, Symposium Rollerblocks; ASC Tube Traps, RPG BAD & Abffusor panels; VPI HW-17F, Loricraft PRC4 Deluxe record-cleaning machines. —*Michael Fremer*

Cabasse La Sphère

Editor:

First I'd like to thank Michael Fremer for the exciting time we had together, sharing our passion for music and engaging sound through numerous tests and comparisons of different components as well as digital and analog sources. It was a rich experience, although I missed the pleasure of meeting with John Atkinson at MF's place and comparing measurements process and human perceptions with him as well.

Regarding measurements, I was surprised to see that my mine were much smoother that the ones John gathered, and in many ways mines were more in line with MF comments. The one major exception is the level of the tweeter. My records reveal that it is aligned with the one of the midrange. This is not a surprise to me, as I did not modify in the processor the anechoic room set-up for both ways. Michael and I were missing some air in the upper frequencies, and as we significantly improved the treble reproduction when using a Tara Labs cable between the preamp and the processor, I intentionally choose not to raise the level of the tweeter. And that was for two reasons: first, Michael was also intending to use Tara Labs cables between the processor and the power amps so I expected another step further in the upper range results. Second, he is well familiar with the acoustics of his room. An inappropriate compensation would have probably sounded unnatural to him, thanks to his skill in sorting out what is intrinsic to the system *vs* what comes from the nicely damped room.

So I am puzzled here: While I believe Michael and John when they mention they miss some level in the treble, I do not see why our near field measurements are different. Nor why our measurements around the listening point alike, where on both the treble level is, not surprisingly, rolling off from 10 kHz, far above the 4 k Hz low-pass frequency. Regarding the peak around 30 Hz, it represents only +4dB at Michael's listening point compared to 100 Hz. Listening tests with +2 dB and +0dB at 30 Hz instead of 4 dB were frustrating, especially with digital software. Therefore, I decided to leave a room characteristic that Michael is used to at his listening position, even if, away from that one listening armchair, the LF level rises dramatically in most areas.

In his detailed review, Michael is asking for answers on some "digital" points. John already answered for the choice of 24-bit/48kHz conversion : more precision. The 24/96 option implies dividing by 2 the processing complexity when the 24/192 does it by 4. The other "digital" question refers to the choice of ICE amps and deserves more than a "0" and/or "1" answer. We selected those amplifiers to offer the best possible entry package for La Sphère: an optional set of eight amplifiers combining perfectly together and to not affect the absolute linearity in-phase of the system, and with 1000 W for the 22" unit. A set of amps as compact as our speakers, especially considering the built-in drivers and their specs, actually requires a very small space: 5200 W in one-and-half square feet! This unique solution is already creating great excitement for audiophiles and music lovers around the world; some are ready for more and would (like me) have been delighted to read Michael's comments on a "La Sphère" set-up with four of his reference amplifiers. Perhaps next time, and in a larger room!

A full digital chain from SACD player right down to the amplifiers, has been considered at Cabasse. In fact, it still is. For this project, though, we decided to concentrate on the speakers and processor. You know, it took us 15 years to create a digital processor sounding better than our active analog filters, so please allow us a bit more time to develop, experiment with and validate with listening sessions a full digital solution.

Among all of Michael's positive comments, I want to thank him for pointing out the signature qualities of the Cabasse soundstage: wide, especially deep, the most stable and three-dimensional images. These qualities are inherent in all our speakers that are based on our Spatially Coherent System principle, especially spherical enclosures and co-axial drivers. We believe these qualities can be achieved only with point source systems, where the response at the listening point is very smooth, showing perfect coherency between direct sounds and reflected sounds.

La Sphère is a masterpiece that encompasses 60 years of development in high performance drivers, filters, and acoustical know-how. Every model from the Cabasse range owns a part of La Sphère– that little something extra that makes your favorite tracks sound real.

Christophe Cabasse,
Cabasse Acoustic Center, France

Cabasse

www.cabasse.com