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EXCLUSIVE. PRIVATE AUDITION/MOREL

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With her half-human,
half-android shape
reminiscent of the
creature in Ridley Scott
Allen's film, Morel's
"Fat Lady" radically
departs from the right
angle tradition of
loudspeaker enclosures.
This sculpture, devoid
of parallel faces, has
required three years of
study before it came to
being.

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"FAT LADY" LOUDSPEAKERS

MOREL

"FAT LADY" LOUDSPEAKERS

"It's not over till the Fat Lady sings". Such has been the motto of Morel - the Israeli manufacturer who created the "Fat Lady" – an extremely unusual loudspeaker. Indeed, this acoustic diva shakes up quite a number of misconceptions as soon as we hear her sing and express herself. This loudspeaker really made us vibrate at the last Las Vegas CES.

It was last summer, while preparing the magazine summer edition that we discovered the Fat Lady Project. We knew very well the speaker manufacturer Morel - abbreviation of MORdechai ELeCtro-acoustics, a company founded in 1975 by Meir Mordechai in Ness Ziona, Israel.

He has at his disposal a complete line comprising subwoofers, woofers, medium units and tweeters, all of which are based on extensive technologies, which many loudspeaker manufacturers throughout the world put to good use in their high-end models. And it is during our test benches that we regularly discover that

Morel supplies so and so builder with models OEM or directly from his catalogue.

Furthermore, Morel develops his own loudspeakers and enlarges his offering with models for the "Car Audio". All that the brilliant designer needed was an extraordinary realization that would once and for all establish his reputation internationally. After almost three years of study, research and finalizations, Last January Morel has finally unveiled his trump card in the uncompromising loudspeaker battle. The Fat Lady was immediately crowned in Las Vegas with the 2009 "Design and Engineering Showcase Honors" Prize for Innovation.

The Lady is not so fat...

What strikes from the outset when one sees a photograph of the Fat Lady for the first time is the appearance of the loudspeaker, its lines without any parallel facing and all curves? The most original factors attempt in effect to give grace to their creations while trying to respect the incontrovertible laws of physics. Among the most successful examples, we shall mention the very sensual Muon de Kef which withdraws to the background thanks to its shapely metal structure, or in a different register, JM Lab Grande Utopia EM, with a very contemporary architecture the elements of which seem to be floating in space. For the Fat Lady, Morel has attempted to cross other frontiers in relation to the marriage between the speakers and the enclosure. One of the main ideas of the project directed by Oren Mordechai has been to work on the coupling and the interactions between transducers and their loading volume. Could there be a possibility for the speaker to be assisted in its operation by the structure that houses it by virtue of its shape,

The transducers applied on the "Fat Lady" were manufactured by Morel and either came from the builder's well stocked catalogue or they were specially designed for this exceptional enclosure. Here we can see the Acuflex-processed soft dome tweeter moved by a "flat pancake" neodymium magnet.

Building Features

Price: \$35,000 the pair (not imported)
TYPE: 3 way bass-reflex, drum in carbon fiber, fiberglass and epoxy resin
BASS SPEAKER: 22cm Rohacell - carbon composite membrane
MIDRANGE SPEAKER: 15cm Rohacell - carbon composite membrane
TWEETER: 28mm Acuflex- processed soft dome
FREQUENCY RESPONSE: 20Hz-25 kHz (50Hz-18kHz +/- 1.5 dB)
ADMISSIBLE POWER: 300W (1000W peak)
Sensitivity: 87dB/W/m
Impedance: 4 ohm
DIMENSIONS: 1270x340x440mm
WEIGHT: 44Kg

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the materials that constitute it, or its rigidity? Could there be reason to think that the mechanical behavior of each exacerbates the qualities of the whole? This attempt to penetrate deep into the laws of acoustics has led to a unique enclosure with generously seductive shapes, yet each one of those curves is the expression of a very specific functionality. It should be noted that the design of this exceptional speaker enclosure was a result of the collaboration between Morel and the designers Alain Fouraux et David Zuman, both recognized for their work in the fields of architecture and urban design.

The Fat Lady was built by Morel using state-of-the-art techniques very similar to those in use in the aeronautics or Formula 1 industries. It is constituted with a very light envelope in coated carbon fibers skillfully mixed with fiberglass and epoxy resin. The rigidity is exceptional, and finger tapping doesn't create any audible resonance. The grooves and the humps delineated by the Fat Lady make her resemble a musical instrument with no parallel faces. The different compartments housing the transducers remain empty, no internal damping materials are used. And this is the project's fundamentally innovating aspect: the empty structure vibrates with the speakers in a carefully studied and controlled manner and the energy developed by those vibrations contributes to the restitution of the enclosure. Better yet, the drum or rather each compartment (in particular bass and medium) vibrates as if it is the speaker's shadow. It follows closely the behavior of the speaker so that no delayed wall vibrations relative to the signal emitted by the speaker remain. Consequently, the enclosure no longer sounds like a traditional loudspeaker enclosure whose cabinet plays often and involuntarily by itself in its corner.

High Couture Speakers

Under this audaciously sculpted body the speakers are the heart and soul of the "Fat Lady", specially created, and even developed, for the occasion, like the two 22cm diameter bass units, derived from the SCW models of the builder's Supreme series.

These woofers receive a composite membrane formed with a sandwich composed of two carbon fiber sheets on each side of a Rohacell layer, creating a very rigid and very damping cone. This membrane integrates a central dome directly formed in it. We shall note that these materials are similar to those of the structure's enclosure. The long mobile coil mounted on aluminum support is an EVC (External Voice Coil) [the coil can be seen very clearly through the basket assembly]. Its diameter is 75mm in Hexatech aluminum wire of hexagonal section. This technique permits to guarantee optimal fullness factor in the pole gap (the coil takes less space while creating more ampere-turns in the pole gap than a coil having the same dimensions but in cylindrical wire). It is immersed in a field of 1 Tesla generated by a double Hybrid Magnetic circuit, a house technique based on ferrite and neodymium. The central polar piece is covered with copper, the whole is mounted on

The 15cm Rohacell carbon sandwich membrane midrange unit and the tweeter (here without dome protection) are mounted at the top of the carbon fiber shell.

The two 22cm Rohacell carbon sandwich membrane woofers are at the bottom of the enclosure. They are powered with parallel connections.

The overall dimension on the ground of the Fat Lady is quite reduced, the foot-support profile repeats the geometric shape of the bass volume

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a rigid but thin-ended Uniflow™ chassis frame, completely unblocking the back of the membrane. The 15cm medium unit is also derived from Morel's Supreme series model, the SCM634. It practically uses all the technologies implemented in the woofers, except for the magnet which is in neodymium and the coil of same diameter but shorter, which is "underhung" (shorter than the length of the pole gap). On the other hand, this speaker implements a proprietary technique called DLIS (Dynamic Linear Impedance Stabilizer). The coil receives a

copper shield which allows regulating and softening the impedance curve in dynamic state. The resonance is around 49Hz, remarkably low for a midrange speaker, the impedance

The suites made available by the Venetian Hotel do not offer very favorable acoustics. Nonetheless, the Morels magnificently got out of that trap with a particularly neat and powerful bass without exciting the pieces' resonance.

is only 17 ohm and only rises to 8 ohm at 20kHz.

Regarding the tweeter, the model implemented is directly issued from Model ST1108 of the Supreme series developed with all of Morel's technological know-how. The 28mm soft dome is processed with Acuflex, a material perfected by Morel to regulate the dome's response curve. As for the midrange, the "underhung" EVC mobile coil is a Hexatech™ profile aluminum wire on aluminum support, the "flat pancake" (shape of pastille) neodymium magnet develops in the pole gap an induction field of 1.8 Tesla. The regularity of the response curve is exceptionally linear, between 1 kHz and 15 kHz with practically nil directivity up till 45° outside the axis.

Filtering is of the first order for all transducers, with connections at 200 Hz and 2.5 kHz. Polypropylene film capacitors and very low resistance Mundorf series inductances have been retained for their great sound transparency as well as the MIT produced wiring and the simple WBT terminal block.

The foot of the "Fat Lady" is leather-clad like a luxury shoe. One discerns in the back the simple terminal block from WBT. The builder didn't wish to offer any bi-wiring option or bi-amplification because the filtering specifically studied for the enclosure contributes to its exceptional restitution.

The keel of a mono-shell of the Vendee Globe? Alien's back? Neither. This is the backing of the bass speakers' load volumes which only need very few liters to tickle the extreme bass.

Listening

Following the July-August 2008 no. 131 edition of our magazine, we received an e-mail from Morel thanking us for our brief presentation of the Fat Lady. Rather flattered by this positive reaction and having learnt that the manufacturer would exhibit in Las Vegas CES in January, we contacted the company to try to set a meeting at the press conference that was to be held on Friday, January 9, at the builder's stand for the launch of the Fat Lady - which we have obtained without any difficulty. We shamelessly took advantage of the opportunity to request a special audition of the Fat Ladies, in order to really figure out the personality of these objects of desire and that was granted without hesitation. We have been able therefore to proceed to our private audition in sun-baked Las Vegas for a whole hour, with all the Morel staff at our disposal. Royal!

To be honest, we were very skeptical as to the sound qualities of the Fat Lady based on the fact that their look is at the antipodes of traditional concepts. How stupid! How close-minded! How can one make such a judgment just by looking at a photograph? Needless to say, we felt slapped in the face as soon as the Fat Ladies began playing for us. Despite their 1.27m height, these systems appear delicate and project an indefinable impression of fragility. The curbs perhaps or the narrowness of the structure, something in them seems to invite measure. Nonetheless, it didn't take us very long to discover the true face of these divas even connected as they are to a "modest" Cambridge electronics assembly. To summarize, we would say that they know how to recreate everything, from symphonic music to the most nostalgic blues, from opera to acoustic jazz, with a substance, a harmonic analysis, subjective neutrality, a bandwidth, a spectral balance that one practically never encounters in the models of this type. How to say it? The reproduction takes on really astonishing spatial proportions, with an airing of the sound scene and a precision of the localization which make the sound environment palpable. On

the blues of Mighty Sam Mc Cain proposed by Morel (it's a SACD we frequently use during our auditions, our work bases seem healthy...) the artist's and his group's performance appear extremely fluid, close cut, the instruments are perfectly

On the photo on the left, we see the separation in glass fibers between the bass volume and the medium volume. This separation plate is positioned in such a way so as to "make agree" the medium compartment and the enclosure's shell. On the right, we can see the open piece in fiberglass located above the top woofer, which contributes to reinforce the structure.

These two photographs show on one side the reinforcement parts in the bass volume and on the other side their peripheral look adapted to that of the main structure in carbon fibers reinforced with fiberglass. Once again, the precise shape and positioning of these pieces show the imitative vibration of the structure and the speakers.

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positioned in the studio where we perceive a large quantity of small ambiance noises which we have rarely heard with such precision. No tonality, no drum vibration to cover the sound message. We voluntarily raise the sound volume in order to evaluate the behavior of the Fat Ladies in bass. The big drum foot beats bang without the slightest trailing, no room resonance seems to be excited by the sustained bass guitar line, this is great art in the Venetian Hotel room, which was barely acoustically processed for the occasion.

On Bizet's *Carmen*, the image develops well beyond the enclosures, the scene of extreme stability permits to follow very precisely each interpret, with a very special mention for Carmen's castanets whose very rich information restitution (harmonics, sound level of the snaps, diversity of the timbres) help determine easily the distance of the heroin. On Diana Krall *Temptation* track (one of our favorite tracks at the magazine), the contrabass which most of the time damages the enclosures'

cabinet work passes here without a box effect or other interior wall vibration. As a result, the gain in tonal color truth from low-medium to bass is impressive. The various and varied timbres of this track (voice of the singer, piano, electric guitar, battery coppers) are of an astonishing realism. The treble runs with subtlety and delicacy, finally some "s" that do not hiss, and a discrete high treble in perfect fusion and total cohesion with the other registers.

Conclusion

The Fat Ladies are truly a master stroke on Morel's part, The builder now enters head on into the very closed circle of uncompromising very high-end speaker systems manufacturers. The perfect osmosis between first choice transducers and carbon fiber acoustic sculpture confers to the Fat Lady a restitution of exceptional transparency and neutrality. Offered in the USA at the price of \$35 000 the pair, they will be commercialized by the builder via a specially selected network. They are well worth it.

Pierre-Andre Viollet

The membranes of the woofers and the medium unit (photo) are based on carbon fiber as is the main structure.

CES LAS VEGAS

We have realized this audition during the Las Vegas CES Salon, in a room of the Venetian Hotel.