

GRANDE UTOPIA™ EM™

Press release - Saint-Etienne - July 2008

The 2008 event: The “Grande Utopia”, third generation, comes out. Like the two previous models, it launches a major technological innovation that marks a break with the norm: the Electro-Magnetic motor woofer, the EM. Such a considerable advance in the bass that it gives it its complete name: Grande Utopia EM.

The Grande Utopias are not only loudspeakers that have had a great impact on their generation. It's also a concept that is full part of “The Spirit Sound”: tradition, pleasure, innovation, the best in the world. A new Grande Utopia is not conceivable without major innovation, able to establish itself as a long-lasting technological milestone. The one of 1995 launched the “W” technology, but not only. The one of 2002 brought the pure Beryllium tweeter, but also numerous other innovations. The outstanding idea lies in the fact that almost all innovations were taken back by the Grande Utopia EM, which tends to prove their merits. Being a reference is not being a fad.

Bigger than ever

The 2008 Grande Utopia had to be immediately visually identifiable. Keeping its imposing aspect of a reference loudspeaker, without being massive. To reach our first goal, we kept the Focus Time structure and the separate blocks for each driver, the true aesthetic signature of the Grande Utopia. To lighten the shape, the delimitation between the blocks is more important (the cabinets seem to be suspended in the air). The chosen design main line was simplifying the object in the extreme and eliminating what could be aesthetically superfluous. Handed over to Pineau & Le Porcher agency, with which Focal-JMLab has been collaborating since 2003, the Grande Utopia EM's design is all purity and clarity - obvious. That's a truly amazing feat for a loudspeaker that now reaches 78^{3/4}” (2m) high and weighs 573.2lb (260kg)... Firstly available in an integral black lacquer version, the Grande Utopia EM will be suggested later in different finishes.

Electro-Magnetic EM

The expected great technological step in the bass is reached with the 15^{3/4}” (40cm) woofer with an electro-magnetic motor. The principle: the permanent magnet is replaced by an electro-magnet. Thus the magnet force can become endless – or flexible. Just one figure: the woofer Force Factor of the previous Grande Utopia Be reached the respectable figure of 18.5T.m, it now goes to 34T.m, that's to say an 83% progress. A figure that foretells a spate of others: the field in the air gap reaches 1.75T, the efficiency 97dB/1W/1m, that's to say a sensitivity superior to 100dB for 2.83V. These figures can make you wonder concerning the dynamic bandwidth but moreover when we combine them to its resonance frequency: 23.8Hz, that's to say an almost “unusually” low value, considering the reached efficiency. Because, so far, we had to choose between the two: high efficiency or ability to go down in the low frequencies, until we reached the right proportioning, and that was an acceptable compromise.

The choice of the EM technology is the clear consequence of the absence of any compromise: we wanted a superlative woofer, which was not possible with the classic magnet technologies. We called on an ancient technology that had been dropped out because it was too complex, able to reach extreme performance: the electromagnet. A technology that we improved thanks to the simulation software of the



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magnetic motors and high-performance modern materials. In the end, the electro-magnet uses no less than 15.4lb (7kg) of copper, for a 48.5lb (22kg) motor and a total weight of 52.9lb (24kg). A “monster”, in the literal meaning of the word, which manufacturing costs cannot be compared to a standard magnet and are only conceivable on exceptional loudspeakers.

The electro-magnet power supply is external and has a signal recognition system. It offers above all an adjustment of the power supply tension on 6 levels (for a delivered power from 9W to 90W). So that's the choice of a complete sound range for the bass, deep and round, or punchy with a “live” sound, and 4 intermediate levels to program a flexible bass sound. These adjustments permit to ensure a control of the bass without precedent, keeping control of the speaker / listening room coupling (making the over-voltage coefficient vary but also the efficiency on a +/-3dB scale).

IAL2: The pure Beryllium inverted dome tweeter that goes up and down

The inverted dome tweeter of the Grande Utopia Be had already demonstrated the superiority of pure Beryllium in high frequencies thanks to its unequalled mechanical qualities in terms of lightness, rigidity and damping, reached simultaneously.

Our other obsession, that started with Electra 1000 Be and its IAL technology (Infinite Acoustic Loading), has been to make the tweeter go as low as possible to obtain the ultimate full-range driver.

In that way, this approach is close to the EM woofer: how to go high and go deep down with a very high efficiency? How to make these fundamentally opposed principles coexist? By reconsidering the tweeter design.

We started from the IAL model with the only imperative to go even further in all fields. The principle is based on a tweeter designed like any other driver, the back of the dome is totally cleared up, to be loaded by a tuned cavity. Double advantage: control precisely its Thiele & Small parameters to get extended response in the bass and reduce the resonance frequency. Here is the key point: this frequency must be relegated to the lowest possible frequency, so that it won't interfere with the sound rendering. Over-voltage, distortion, aggressiveness and ringing are the most obvious signs of an insufficiently low resonance frequency. Going from 1280Hz to the Grande Utopia Be's 528Hz, the accomplished progress is clear, with a significant safety margin compared to the tweeter bandwidth, from 2.2kHz to 40kHz.

Problem: the efficiency increase implied an inescapable rise of the magnetic mass as well as its volume, which is incompatible with our will to clear up the back of the dome.

We cannot increase the magnet width. But we can increase the length. So we set a streamlined tube, in a turbine shape, made of 5 sections of Neodymium for the IAL2. As a result, the magnetic field in the air gap reaches 2.15T and the efficiency increases by 1.5dB.

We can notice that the Focus Ring of the previous Grande Utopia Be has disappeared: that's the only device that was dropped out in the long series of decisive technological steps that were taken back from the first Grande Utopia. This system, made of Samarium-Cobalt magnet (chosen for its high Curie point with little sensitivity when temperature rises) boosted by a Neodymium magnet, had no more essential purpose. The IAL2 structure, all in length with its dome, but also its entirely cleared-off voice coil and the increased mass of the magnet and the polar parts have outshined the Focus Ring. Unless it's now a natural Focus Ring - simple. It's a tradition of Utopia to eliminate a problem at its source.



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Adjustable Focus Time, a little craziness makes the Utopias move forward

The very structured shape of the Grande Utopia EM immediately evokes a kind of spine. Could we articulate it so that shape and function are in adequacy? In other words, could we go through the original Focus Time system by suggesting a mechanical adjustment to optimize the Sweet Spot according to the listening distance? Articulating a 573.2lb (260kg) loudspeaker could have been considered as an unacceptable argument at least and without doubt as inconceivable. But too irresistible not to be tried! Thanks to a system of endless screws operated by a handle (covered by a seamless Chapal leather, the best in Made in France luxury) placed in the back body of the tweeter compartment, the 4 upper enclosures of the Grande Utopia EM can spread out. In the end, the use is simple, the handling is soft and here comes the indefinable satisfaction of having tried and achieved the impossible.

OPC+: The exceptional becomes personal

A reproach that could be leveled against the previous Grande Utopia models was their absence of adjustments that could make one fear that their unconventional potential could be damaged by non-optimal acoustics. And that the perfect compromise could not easily be found knowing that the size of the rooms from a country to another, the furniture and decoration, can considerably fluctuate. Without even taking into consideration any personal choice...

Since the beginning, this notion of refined personalization of sound, without distorting the signal integrity, has been integrated to the project. The Grande Utopia EM then offers a great variety of adjustments, in the infra-bass, bass, midrange and treble registers, that's to say a total of 1458 possible combinations.

A figure that can alarm, except that it is part of a logical and long-experimented approach. Thus, an adaptation for a very big room with very clear acoustics for example, comes to a very precise, typical combination of the extreme bass to the treble adjustments, as detailed in the supplied table. A sharp optimization around the typical values can be set by the installer on site.

Extremely sophisticated (4 way configuration, added to the numerous adjustments) and divided in 3 sections in the loudspeaker, this crossover needs 16 hours of assembly and is only made of quality components chosen during comparative listening tests, without taking into consideration fashion or price, up to the internal wiring that was specially taken care of.

All-out maximization

Almost every technologies taken from the previous Grande Utopias have been kept. To begin with, the "W" sandwich cone technology, the signature of the first Grande. But a third generation "W", thanks to the new laser machines that permit an extremely precise cut-out of the cones, perfectly straight and round. Or not exactly straight or round depending on the cases in order to better control the cone fractionation. A precious tool that permits a significant evolution of the "W" characteristics.

The Power Flower midrange drivers, designed to limit the magnetic leaks, are maintained. But everything's new since the arrival of the third generation "W", the spider, the surround and the moving voice coil in order to gain in efficiency. Necessary evolution for a midrange that should not be stuck between a woofer and a treble in clear progress.

Same thing for the 11" (27cm) mid-bass with Multiferrite, re-designed to bring more dynamics and linearity, as well as clearly improved efficiency.



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That's the same for the Gamma structure (the idea of a stable – then heavy mechanical reference) that was re-defined. With the collaboration of a company specialized in measures, some vibratory cartographies of the loudspeaker panels were determined to reinforce or modify the structure wherever a weak point showed.

Evolution or revolution, the Grande Utopia EM is positioning somewhere between the two. It's part of a mythical, traditional series, which more than ever confirms Focal's position as a major actor in our industry.



About Focal-JMLab

Since its foundation, Focal-JMLab has grown to become one of the world main hi-fi loudspeaker companies. Headquartered in Saint-Etienne, France, it is now internationally recognized as a world leader in the design and manufacture of specialist drive units for hi-fi loudspeakers. It is also pre-eminent in the design and manufacture of specialist loudspeaker drive units for car-audio and pro-audio; and in the creation of highly advanced, complete hi-fi loudspeaker enclosures priced from 125 euros to 70,000 euros and 99 euros to 2750 euros for car-audio. Market-leader in France, it exports over 73% of its output mainly in Europe, North America and Southeast Asia.

The company key strength is its complete integration and quality control of the loudspeaker manufacturing process, from the design of drive units, cabinets and crossovers, to the assembly of the finished product. Focal-JMLab maintains an intense, continual programme of research and development into drive-unit technologies. Five patents have been registered since 2003.

Focal-JMLab currently employs over 200 people in modern facilities of 12 500m² (134 550 ft²), that concentrate production, R&D and management in the same site. The strengthened turnover of the Focal Audio Group reached 29.6 million of Euros in 2007.

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