

## Profile Tweeter

*Profile employs our recent aluminum-magnesium alloy inverted dome diaphragm in its most sophisticated version. The objective is not so much to improve the already excellent high-band performance, but to focus on the lower range, with increased linearity and decreased distortion.*

The Profile tweeter replaces the TRC model of the preceding Electra line, which used a dome from the Tioxid 5 family (titanium dome covered with a 5µm film of titanium oxide). The knowledge acquired from mastering the pure Beryllium dome demonstrates that we have indeed pushed the evolution of the technology to its limits, especially in matters of damping. The alloy of aluminum-magnesium is an excellent solution; with similar characteristics of rigidity and linearity, damping is far superior. Indeed, the nature of the material permits the design of a less concave form than in the past and which is much more favorable acoustically. It also allows the removal of the phase piece, which is occasionally the source of compression and distortion. This being said, the Profile tweeter joins the Utopia Beryllium TBU from which it borrows other essential characteristics.

### The inverted dome tweeter

The traditionally designed tweeter with convex membrane requires the use of a coil glued to the peripheral edge of the dome. There are no other possible choices. This, however, is far from favorable, as the mechanical coupling is less than perfect. There is a true lever effect between the center of the dome and the far removed coil. Tests and simulations show that the center of the dome is no longer reactive at high frequencies, and stays frozen. Only the peripheral edge of the dome in direct contact with the coil (the most rigid) is reactive. Dynamic behavior is compromised, which translates as a decreased output and an affected directionality.

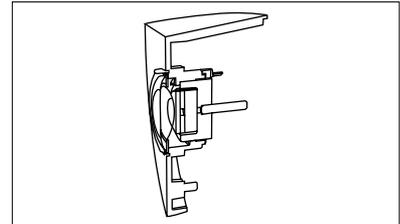
An inverted dome acts much like a woofer, in smaller dimensions. The coil rests on the inner part of the dome, distributing the impulse more uniformly over the entire surface of the dome. This improved mechanical coupling also permits a lower resonant frequency, an important consideration when determining the cutoff frequency between the tweeter and the midrange, with a minimum of distortion. Last, but not least, compared to a conventional dome of equal diameter, the inverted dome's coil has half the mass, an enormous conservation of energy. This is an essential parameter in dynamic behavior.

### The Profile tweeter

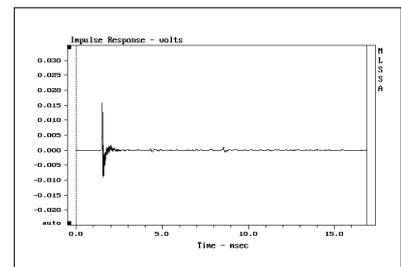
The Profile tweeter is a more elaborate version of the aluminum-magnesium dome from TNC of the Chorus series, which itself is a very successful model. Other characteristics of the design are groundbreaking. The very compact magnetic circuit uses Neodymium N48M, the most powerful element in its temperature class (100°). The flux density rises to 1.7 Tesla, compared to 1.5 Tesla of the TRC. Neodymium is a material that has enormous benefits, but does have one defect: the magnet tends to demagnetize under extreme heat, which is the case in certain circumstances).

This particularity required precautions to avoid raised temperature, proportional to the intensity of the current circulating in the coil. The excellent performance of the inverted dome allowed us to find the solution: the coil has an impedance of 6 Ohms with a comparable, if not higher sensitivity than a tweeter equipped with a coil of 3 or 4 Ohms, thereby giving the same acoustic output at only half the current. Also of note: heat dispersion is so low that no Ferro fluid is required, which would hinder the movement and performance of the tweeter (loss of detail and dynamics due to a sticky fluid). As in the Utopia Be TBU, this tweeter uses the same Poron® suspension. It is a cellular urethane foam that, aside from its remarkable damping qualities (used in silent-bloc, anti-vibration installations...), it is perfectly stable over time, keeping its mechanical qualities regardless of the demands placed upon it.

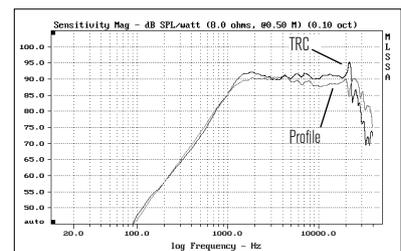
The use of Poron® also inhibits the suspension from acting upon the dome. Compared to the TNC, the levels of distortion are lowered by a factor of 1 to 10 at 1 kHz and almost as much at 2 kHz. This immediately translates to a very clear high band, which is more transparent in the remarkably low cutoff area at 2.6 kHz, where the ear is extremely sensitive. Even more important, in optimizing the magnet and its loading into the baffle cavity, we employ an advanced Thiell and Small configuration which benefits from a better linearity. This allows a much better union with the midrange thanks to a better-distributed energy. The result is a delicate and ethereal finesse, without coloration, or a sonic character at a given frequency. The absence of subjective distortion, even at high levels and at the crossover frequency, is another quality of this design.



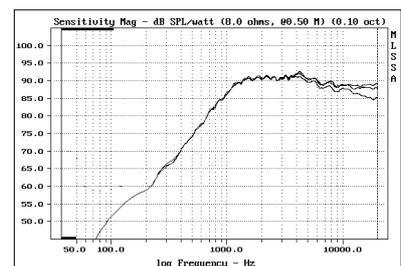
The Profile tweeter is housed in a massive, inert piece of formed Zamak. It creates an ideal mechanical coupling which is heavy and stable for the inverted dome.



Step response: proof of the ideal damping at the limits of bandwidth, speed of rise and high power handling translate as excellent dynamic behavior.



The TRC of Electra focuses on definition and energy of the inverted dome Tioxid 5. With Profile, the optimization falls mainly on the lower spectrum with a perfected acoustic alignment and on linearity, with a more sensitive upper bandwidth (above 30 kHz). Of note, the resonance at the end of bandwidth is perfectly dampened.



On off axis response (15°, 30°): remarkable results.