

Cometh **Bösendorfer!**

The \$25,000 Bösendorfer VC 7 horn-loaded loudspeaker system

Part I: AN ILLUSTRATION

Constantine Soo

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Manufacturer:

L. Bösendorfer Klavierfabrik GmbH
Graf Starhemberg-Gasse 14
A-1040 Vienna
Tel. +43 (1) 504 66 51-0

URL: <http://www.bosendorfer.com>
Email: mail@bosendorfer.com

SPECIFICATIONS:

Type:

Horn-loaded, 3-way 6-driver dynamic
loudspeaker system

Frequency Response:

25 ~ 27kHz, ± 3 dB

Sensitivity:

91dB/1W/1m

Impedance:

4 Ω



**Exclusive Presentation
in the U.S.:**

Bösendorfer New York
200 Lexington Avenue, Suite 902
New York, NY 10016
Tel. (212) 684-1956
Fax. (212) 684-2849

URL: <http://www.bosendorfernewyork.com>

Crossover Frequency:

130Hz, 2.5kHz

Music Rating (RMS):

360W

Dynamic Peak:

720W

Dimensions:

52.4 H x 7.7 W x 15.9 D
(inch)

Weight:

80lb each

BÖSENDORFER (bûr-z&n-'do-f&r)

The core realm of high-end audio has always been purveyed predominantly by enthusiasts with electrical engineering background. Back in the 60's, there were also the amateur DIYers around the world whose hobbyist passion fueled the formation of many of today's renowned audio companies.

Now, Bösendorfer of Austria, the oldest piano maker in the world, has not only become the first music instrument maker to enter the high-end audio world with its Hans Deutsch-designed loudspeaker series, it is now also the only audio company in the world with a direct lineage to music-making. Because since its founding in 1828 in Vienna, Austria by Ignaz Bösendorfer, the company's concert pianos have been the preferred instrument of leading musicians. Most noteworthy is its reputable ties to many legendary composers of the early 20th century.



Lizst's Bösendorfer Grand,



Bösendorfer Swarovski,



Bösendorfer Emperor,



Bösendorfer Porsche

"Since it was founded in the year 1828, Bösendorfer has always made an effort to cooperate with leading architects and designers to build pianos that also underline the instrument's exterior value in a contemporary style."

-www.Bösendorfer.com

For instance, a Bösendorfer was preferred by Franz Lizst as the first and only piano capable of withstanding the composer-pianist's powerful and demanding playing in performances of his own concertos. The infamous Bösendorfer Imperial Grand first introduced in the early-20th century is also the only piano to feature 97 keys, of which 9 extra bass keys are provided for reproducing bass notes as low as a bottom C. This Bösendorfer model was used by prominent early-20th century composers, such as Bartók, Busoni, Debussy and Ravel for their own piano compositions.

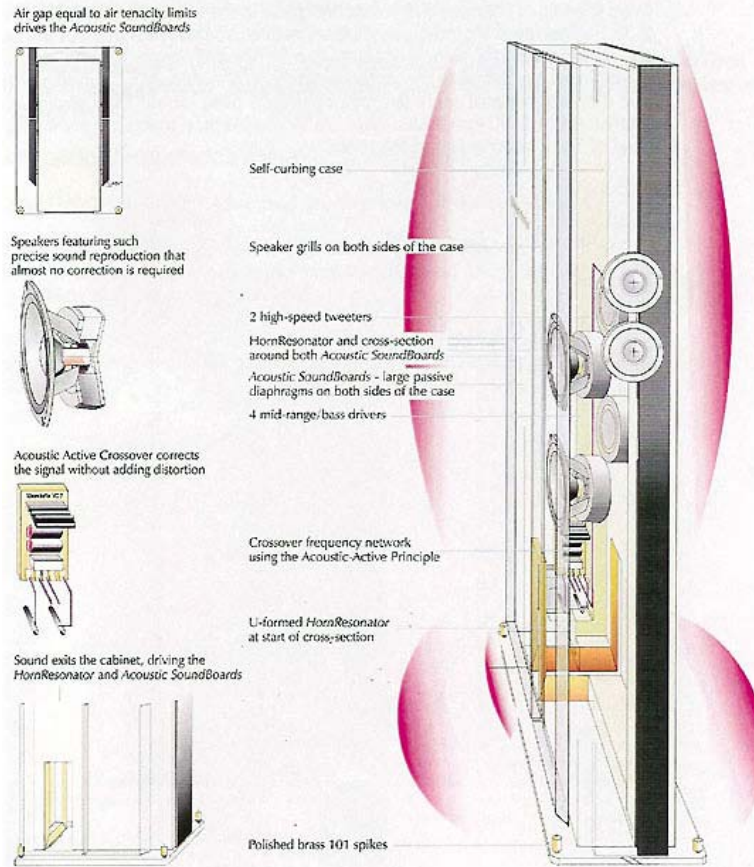
As of 2006, Bösendorfer's incursion into the high-end audio industry is now in its 2nd generation, and its current floor-standing loudspeaker offering includes the 52-inch tall VC7 (\$26,000/pair), the 44-inch tall VC2 (\$16,000) and the 36-inch tall VC1 (\$12,000). For home theater applications, there is also the VC Wall (\$9,000) and the VC Center (\$7,000).

The VC loudspeaker designer Hans Deutsch's full name is Hans Deutsch von Stahlenberg, who, in the late 60's pursued knowledge in the fields of physics, musical performance, psychology, physiology and indoor acoustics from the Technical University of Braunschweig and Aachen University of Technology. The immediate result of which was Hans' first loudspeaker, the Orgel (Organ).

In 1970, from a personal endorsement by Maestro Herbert von Karajan, Hans subsequently developed the Amadeus and Odessa loudspeakers. Two years later, his original *HornResonator* concept became not only fully developed and incorporated into the new Amadeus and Poseidon loudspeakers, the technology was even selected by the new Gastein Convention Center as part of its loudspeaker system planning and construction. Hence, participating Salzburg Festival artists of legendary stature, such as Loneard Berstein, John Eaton and Giorgio Strehler began working with Hans in their musical activities.

In 1980, two loudspeaker systems, namely the Pedro Lume and Santo Domingo, were created via Hans' new "Spatial Sound Reproduction Using the Acoustic Active Frequency Filter" technique that was patented the same year. It is a concept based on Hans' *Acoustic Active Principle* discovery of 1973. Two years later, Hans patented the HornResonator technology, and his speakers went on to become selected in 1989 as German HiFi Vision's "Loudspeaker of the Year".

THE ACOUSTIC ACTIVE PRINCIPLE & HORNRESONATOR WITH ACOUSTIC SOUNDBOARDS



Hans' association with Bösendorfer commenced in 2000, when he developed his 2nd generation HornResonator technology with the piano maker's sound boards, a unique technique henceforth known as *HornResonator with Acoustic SoundBoards*. After the creation of the first sound board-equipped loudspeaker systems in 2003, namely the Amadei-V, Akustik Paravent and Madrigal, the Hans Deutsch-designed Bösendorfer VC loudspeaker series is born.

The importance of the sound board incorporated into the three VC series floor-standing models underscores the alliance between Bösendorfer and Hans Deutsch. The piano is a string instrument; the fact that its strings are hammered during playing does not re-categorize its nature into a percussive one. The sound board bears the critical role of amplifying a world of resonances generated by the playing, as well as accurately reproducing the complex amplitude and magnitude.

The sound boards of the Bösendorfer piano are sourced from the high plateau of Italy, where the average moisture and oxygen content of the air is optimal to creating sound boards of the highest and most consistent quality. The pre-cut wood planks are seasoned from 3 to 5 years in a 4,500m² Bösendorfer timber yard before construction processing.

The same attention to detail is applied to all other elements of piano construction, and the construction of the cabinets of the loudspeakers follows the same processes.

The sound boards' applications in Hans Deutsch's Acoustic Active Principle is best illustrated in the following excerpt from the whitepaper:

"The main goal of conventional technology is the elimination of resonances by heavy damping and the flattening of the frequency curve using powerful crossover filtering. This pays surprisingly little attention to the sound itself. Unfortunately, no difference is made between undesirable and desirable resonances.

The basic acoustic principle remains: Without resonances, there cannot be lifelike sound. Music is played using instruments; hence the authentic reproduction of sound must also require instruments featuring harmonious resonances. While conventional loudspeakers produce illusions of reality, they fail to sound lifelike since all resonances have been eliminated.

Bösendorfer loudspeakers are instruments in themselves. Of course they don't employ active resonators with instrument-specific sounds, as musical instruments do, but instead they use passive resonators, creating a neutral response. It is only through this coupling that the resonators or absorbers are made to vibrate (after Hermann Ludwig Ferdinand von Helmholtz, inventor of the 'Helmholtz Resonator').

Reproduction of essential resonances is one of the secrets of the lifelike Bösendorfer Audio sound."

Hans' Active Acoustic Principle theory states that two types of resonance stimulators are necessary for any speaker to recreate sound of instruments faithfully: an active and a passive one. A loudspeaker's drivers, akin to a piano or violin's sound board, constitute the active stimulator. Yet, a loudspeaker creates opposite phases of sound wave from the movements of its drivers, hence a passive stimulator in the form of the loudspeaker's very own cabinet becomes an absolute mandate.

The solution is the low-vibration bodies and tuned Acoustic SoundBoards of the Bösendorfer VC loudspeakers, which, according to the whitepaper, "represents the best solution for true-to-life sound reproduction".

Instead of following the practice of a great majority of high-end loudspeaker manufacturers in damping their products, Hans complimented a loudspeaker's vibratory nature with CAD/CAM-designed cabinet material and construction, interspersed with specially angled and shaped structuring. The result was a sonically non-intrusive cabinet "of exceptional lightness and airiness".

Situated on the bottom of the sides of each VC 7 toward the rear is a single width-long port opening that runs through both sides of the speaker. A quarter inch of air separates this port from a Bösendorfer sound board on each side of the speaker, which though not touching the cabinet, is secured to the speaker's side panel via 6 clamping bolts at 75 cNm.

Horn enthusiasts among our readers will instantly recognize the bass horn that is now emerging in Hans' calculated arrangement. In an overly-simplified term, Hans' Acoustic Active Crossover technique takes the combined effects of amplitude, frequency, intermodulation and pulse-modulated distortion into account when designing a purist crossover that utilizes the tuned cabinet to its advantage.

This technique allows the speaker's bass drivers to "operate over their entire frequency range and achieve the desired frequency on their own; [while] the tweeter is marginally corrected". In the case of all 3 VC floorstanding speakers, the low-midrange drivers' output rolls off at 130Hz at the lower end naturally, while their upper end, in the VC7's case, crosses over to the twin front-firing tweeters specifically at 2,500Hz. The low-midrange drivers thus radiate in a spherical pattern.

Then, each Acoustic SoundBoard is precisely angled in its coupling to the low-midrange drivers, directing the mid-range frequencies from the forward-located low-midrange drivers toward the front of the speaker, while resonating in passive and sympathetic mode to frequencies below 130Hz through the bass port, producing multitudes of resonances tone across the entire bass spectrum.

An internal narrowing at the starting point of the VC 7's horn structure is claimed to have been devised so as to create a "deep bass filter" effect which, in turn, serves to avoid the typical horn coloration.

The front drivers are two 1-inch, acrylic-permeated silk domes with 4-ply voice coils, which Hans claims to produce superior responsiveness to transient demands and yet remaining inert to deleterious driver resonances. Reinforced and yet flexible internal connecting wires are also employed.

The two low-midrange drivers are 5-inch in diameter, positioned mid-height and toward the front in close, arranged vertically and adorns each side of a VC 7, resulting in four of such drivers for each speaker. These Bösendorfer drivers feature a specially-devised carbon-fiber paper diaphragm with Alaskan hemp that is optimally damped and soft on the inside, while remaining hard on the radiating surface for sound projection. They are subsequently mated to a UV-resistant Styrofoam for its non-resonant advantage.

Voice coil of these Bösendorfer low-midrange drivers is made of high-conductivity, 6-ply coils with Kevlar mounts for its rigidity and linear-damping character. The ubiquitous artificial magnets that are prone to converting energy into heat are excluded from the design of the VC speakers, in favor of air-gap focused magnets with tiny air gaps that excel at converting energy into acoustic pressure instead. To suppress the inherent kinetic energy as generated from speaker movements, Bösendorfer adopts massive steel baskets, steel joints and sound walls.

This concludes the Part I of the Bösendorfer VC 7 loudspeaker system Review.