

# DRUID 2



**SUMMERY [v1]**



The original Druid was finished and lunched in 2001. It made its show debut January 2002 at the Consumer Electronics Show in Los Vegas.

Please see the Druid-1 Summary download for details. The second version [Mk. II] was essentially the original with a few small tweaks to the cabinet and a small change on the high-pass filter.

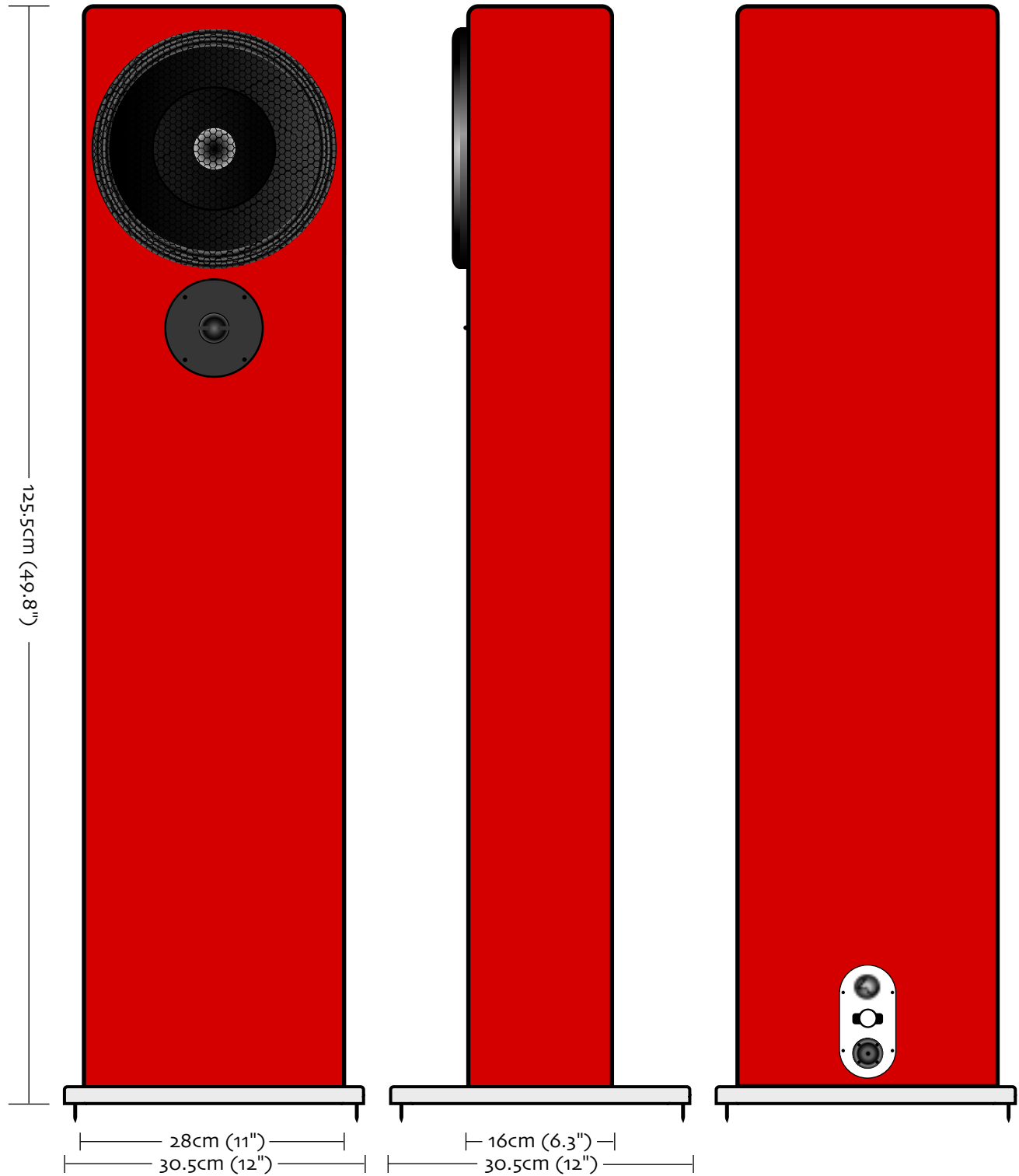
### **Druid 2 Basic Specs**

101dB-SPL, 1W @ 1m  
45 Hz - 25k Hz average in-room bandwidth  
50" [127 cm] tall  
12" [30.5 cm] square footprint  
\$3,600 per pair starting price

[Zu also offered a torsion box graphite composite cabinet for a \$1,500 surcharge—there were no takers. Looking back, damn what a deal!]

Full-range driver was fastened to the cabinet with light adhesive and wood screws. The machined trim ring was fasted with adhesive and required special tools to remove if service was ever needed.





loudspeaker weight: 28kg each (60 pounds)  
shipping weight: 32kg each (70 pounds)  
packaged side: 41cm x 41cm x 140cm (16" x 16" x 54")



# DRUID

Tests & Measures

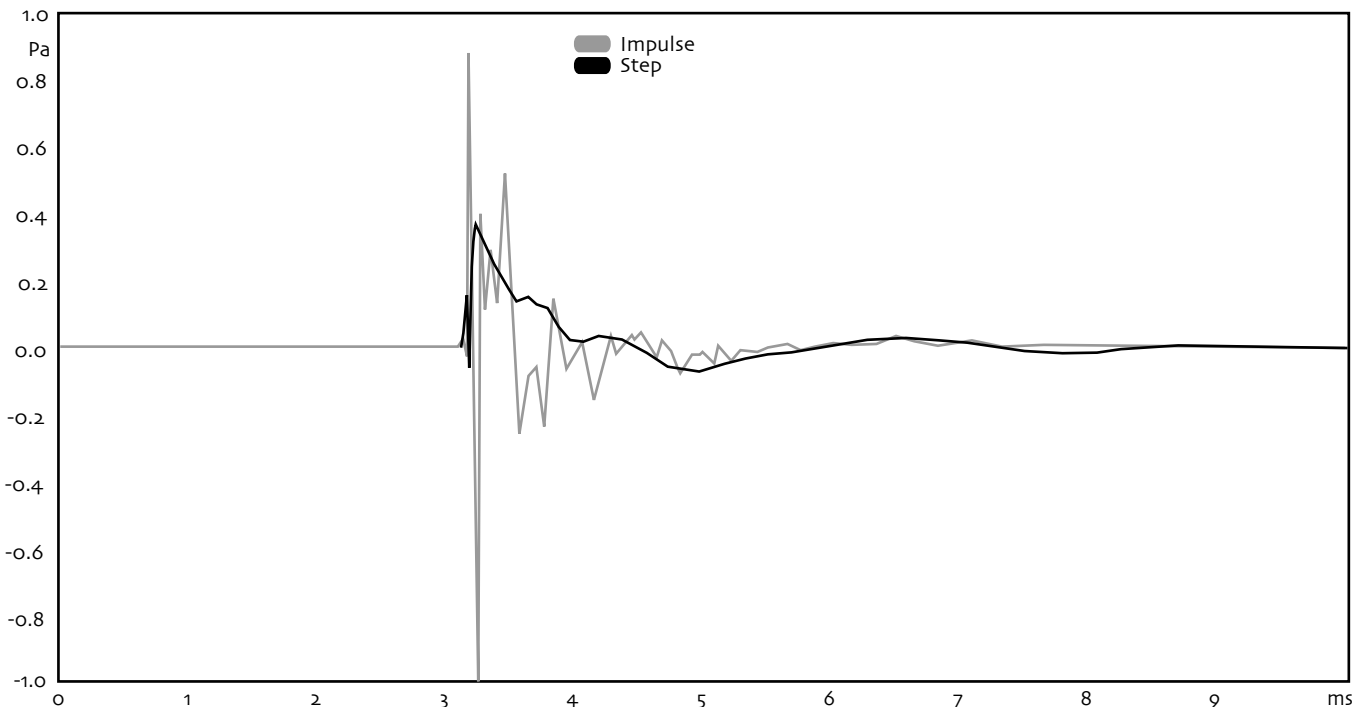
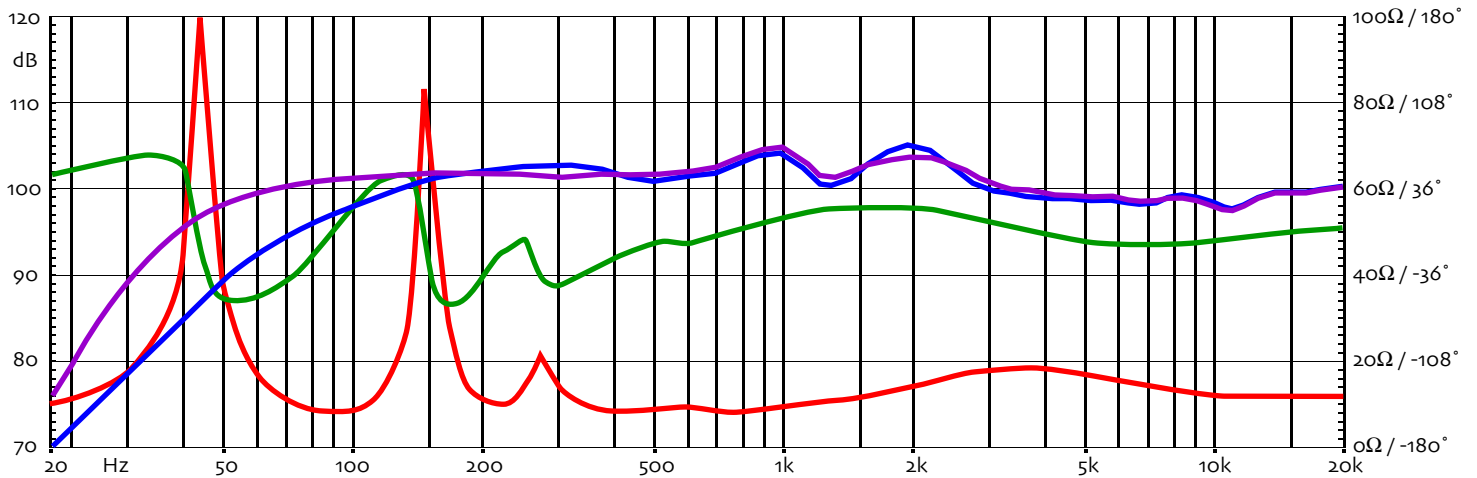
Druid Mk. II measures are somewhere, but were not able to be located at the time this was published. Original measures and Mk. II were nearly identical.

nominal  $4\pi$  sensitivity (200 - 20 kHz): 101 dB @ 1.0m @ 1 Watt ( $V^2 \cos\theta / Z$ )  
 dynamic range ( $2\pi$ ): 130 dB peak 300 - 20 kHz  
 nominal impedance: 12  $\Omega$  (7.5  $\Omega$  min.)  
 anechoic frequency response ( $\pm 3$  dB): 85 Hz - 25 kHz  
 averaged in-room bandwidth (-3 dB): 45 Hz - 25 kHz  
 bandwidth (-6 dB): 35 Hz - 30 kHz  
 bandwidth (-10 dB): 30 Hz - 35 kHz  
 "crossover" point: 12 kHz  
 amplifier recommendation: 2 - 600 Watt / channel (8  $\Omega$  load)  
 power handling RMS: 300 Watt  
 power handling program: 500 Watt

1 Watt input power  
 1.0m mic distance  
 DRUID vertical acoustic center height is 1.0m  
 2001 September

avg. amplitude response ( $\pm 15^\circ$  in-room, avg.)  
 amplitude ( $4\pi$ )  
 theta  $\theta$   
 impedance Z

MLS ANALYSIS Clio® v5.52  
 Tektronix® T922R  
 Earthworks® Lab1  
 Earthworks® M30





### **Brief Overview of Druid Versions**

2001 - Original Druid launched. Featured machined from billet aluminum everything including base. Zu260FR driver with accordion surround and max shove motor, complimented by a 3/4" French made Audax high output dome tweeter. Speakon 8-pole connector facilitating B3 interface for loudspeaker cable input along with Cardas Patented Binding Post for traditional spade inputs.

2002 - Druid 2 [Mark II] introduced with revised super-tweeter filter and improved cabinet construction.

2003 - Druid 3 [Mark III] hits the market. Audax informs Zu that they can no longer produce the tweeter we are using as they are closing their French production of hi-fi drivers. Zu scrambles to finish the driver lens and network. Druid-3 features this new machined from billet lens, driven by the composite dome Eminence super tweeter. Zu260FR/G2 was also introduced and featured a double-roll surround and revised motor for improved bass response. B3 interface is dropped as a feature to help keep price down. Billet aluminum base was replaced by a silver painted wood core plinth also to keep costs down.

2004 - Druid 4 [Mark IV] is launched with slightly improved cabinet due to adhesive changes, improved fabrication technique and precision. Improved harness assembly with the reduction of joints and solder. Revised super-tweeter network. Addition of iridescent and matte finishes. Matte finish is a true matte, but is rough like sandstone.

2008 - Druid 4/08 [Mark IV/08] is launched. Changes are plentiful, with the focus being on a much improved super tweeter. See Druid 4/08 Overview for complete details.

2012 - Druid 5 launches. See its summary for details.

2013 - Druid 4/13 Upgrade kit for Druid 4 owners to upgrade their older Druid to come close to Druid 5.

2017 - Druid 6 launches. Everything changes.



Zu B3 / Neutrik Speakon 8-Pole Pin Assignments

Zu Cable & Loudspeakers

2002-08-07

Zu B3	Speakon 8-Pole
<b>+</b> "Positive" Signal	
+ Primary 0°	1+ Inner Pin Set
+ Secondary 135°	2- Outer Pin Set
+ Secondary 225°	3- Outer Pin Set
<b>-</b> "Negative" Signal	
- Primary 180°	3+ Inner Pin Set
- Secondary 45°	1- Outer Pin Set
- Secondary 315°	4- Outer Pin Set

(2+ and 4+ are unused)



[Marketing Notes Published 2002 @ Zu Audio]

High sensitivity, easy load for amplifier, ultra wide dynamic range and high power handling—natural dynamic reproduction is the foundation on which the Druid is engineered. Matching the natural dynamic range of an event with that of playback results in a dramatic increase in playback realism. In addition Druid tackles bandwidth, amplitude and group delay issues without breaking a sweat. Druid performance is largely due to our newly developed full-range driver. It features very high efficiency, ultra wide bandwidth, minimum group delay, linear dynamic contrast and uniform spectral amplitude—attributes that allow the elimination of crossover and other network components. The amazing dynamic range of the Druid is the result of a very powerful motor and unique acoustic coupling of the cone. The balance of cone weight, material, shape and mechanical suspension also enabled the Zu-260FR driver to reach new benchmarks in bandwidth, dispersion and amplitude uniformity. (Standard hi-fi drivers are not capable of playing much over three octaves without having problems in dispersion, imaging, timbre, timing.)

Complimenting our new driver is our original Grieve driver/box loading model. Why a new box? Because all popular models have some major problem—transmission lines and ported designs of all types control cone motion but at the expense of group delay and other forms of distortion; sealed enclosures perform with much less group delay distortions but cause cone motion to be excessive; horns damp cone motion well but distort amplitude and phase. Druid driver loading and low frequency goals are met through our proprietary Grieve\* enclosure. This is the first loudspeaker to implement Ron Grieve's\* ideas.

Esthetic Design - Small footprint, confident, exceptional fit and finish, timeless lines and materials. With one glance the observer will know the Druid loudspeaker is capable, well engineered and solidly constructed. The Druid's purpose and attention to detail command respect. Did we mention they leap tall buildings in a single bound?

Connection - Druid loudspeakers feature our new proprietary B3 connection using a Neutrik® Speakon® 8-pole interface. A secondary Cardas binding post input also accommodates spades (standard and oversized), bananas, pins or bare wire.

Amplification - Bipolar or F.E.T., class A or switching, O.T.L. or transformer isolated, one bottle single ended triodes or 500 Watt “who needs central heating” pentodes; Druid loudspeakers will work well with all audio amplification designs.

Multi-Channel - There is nothing that will match the level of fidelity that a set of five Druid's will give in a large multi-channel playback system. Sure you will have to have a perf screen and projector for your center front...

(For better or worse, recording and mixing techniques are now and will continue to be focused on the multi-channel reproduction. Druid loudspeaker are designed to integrate with such systems. We believe this direction affords creators, producers, engineers and listeners an increased level of creativity and fidelity.)

Stereo - This past year Zu intimately sampled many of the best loudspeakers in the world. To be competitive you must know your competition. The only comparative shortcoming the Druid has in stereo playback is in the lowest octave. Fidelity in the extreme low frequency is excellent but lacks in amplitude. While a sub may be welcomed, it is not a requirement.



[Marketing Notes Published 2001 @ Zu Audio]

### Features of Zu Druid Loudspeakers

- Zu-260FR full range driver. 8.5 octave bandwidth (-3 dB), 260 mm (10.3") diameter, very high BI, linear motor function, 25 gram moving mass, natural fiber cone assembly, cast frame, precision machined motor and pole assembly, 12 Ohm nominal impedance, 101 dB nominal sensitivity!
- Proprietary Grieve\* driver loading. Our evolutionary loudspeaker enclosure causes maximum wideband cone damping (minimizes cone motion), proper control and coupling of "rear" acoustic energy and reduces low frequency time delay.
- Amplifier intimacy. Elimination of not just the crossover but also any other network element were part of the Druid concept. FET, bipolar, digital, vacuum tube, all amplification types benefit from the increased intimacy the Druid provides.
- B3 connection and internal cable technology. The Druid features our new B3 technology and employees our Wax cable for internal cabling. When combined with a Zu loudspeaker cable featuring the B3 design, cable geometry is maintained from the amp all the way to the voice coil.
- MDF / aluminum, low mass, enclosure reduces energy storage , enclosure coloring and weight.
- In addition to the B3 input, Druid loudspeakers also accept 6 mm (1/4") spades, 8 mm (5/16") spades, bare wire, bananas and pins via Cardas™ pure unplated copper binding posts.
- 20 mm Audax / Zu super tweeter rolling in at 12k Hz.
- Proprietary 6dB / octave split knee high-pass network on super tweeter.
- Spikes are AISI 1062 steel, core hardened to Rc55.
- Zu Finish, our world-class acrylic finish available in any color desired. Custom hues, flames, sublimations and other detail work are available.
- 30-day satisfaction guarantee.
- Lifetime warranty on materials and workmanship.
- Made in USA.





[Marketing Notes Published 2001 @ Zu Audio]

### **Is the Druid a bass reflex (ported) design?**

The Druid is not a bass reflex design and does not correlate to Helmholtz resonators. While the reactance and impedance plots may look similar to those of a ported design, such measures cannot be specifically correlated to enclosure acoustics.

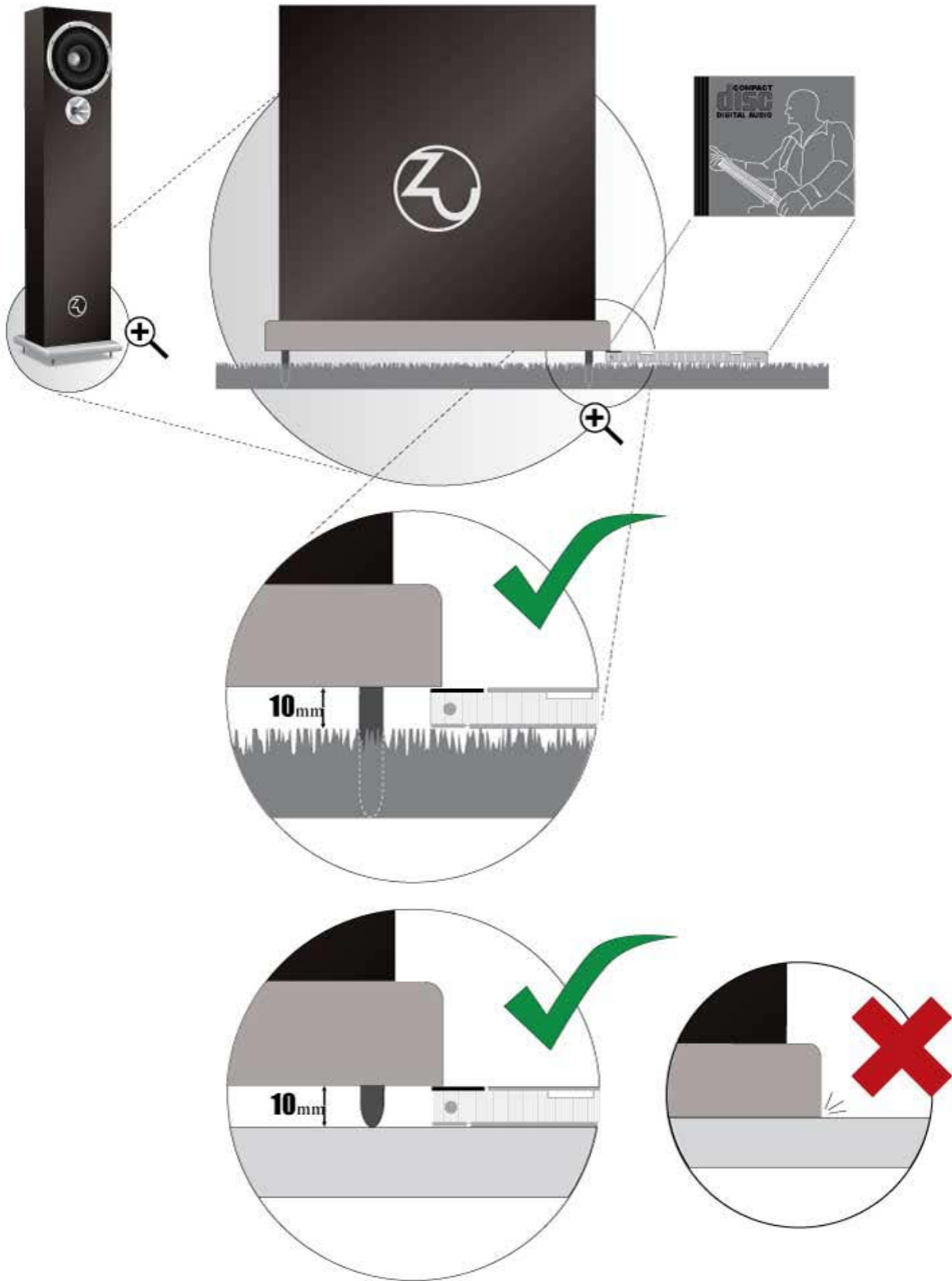
Without divulging the proprietary math and correlations, let me outline a few principles expressed in the Druid and contrast them with bass reflex (ported) designs. A bass reflex loudspeaker uses a simple Helmholtz resonator to augment lower frequencies and control cone motion. A Helmholtz resonator consists of a rigid-walled cavity (the volume) with a neck ("port") with an area and length. The fluid (air) moves as a unit to provide the mass element and if the quarter wavelength is much greater than volume, the acoustic pressure within the loudspeaker box provides the stiffness element; the resistive element is provided by the opening that radiates the simple source sound. All Helmholtz resonators contain these basic elements.

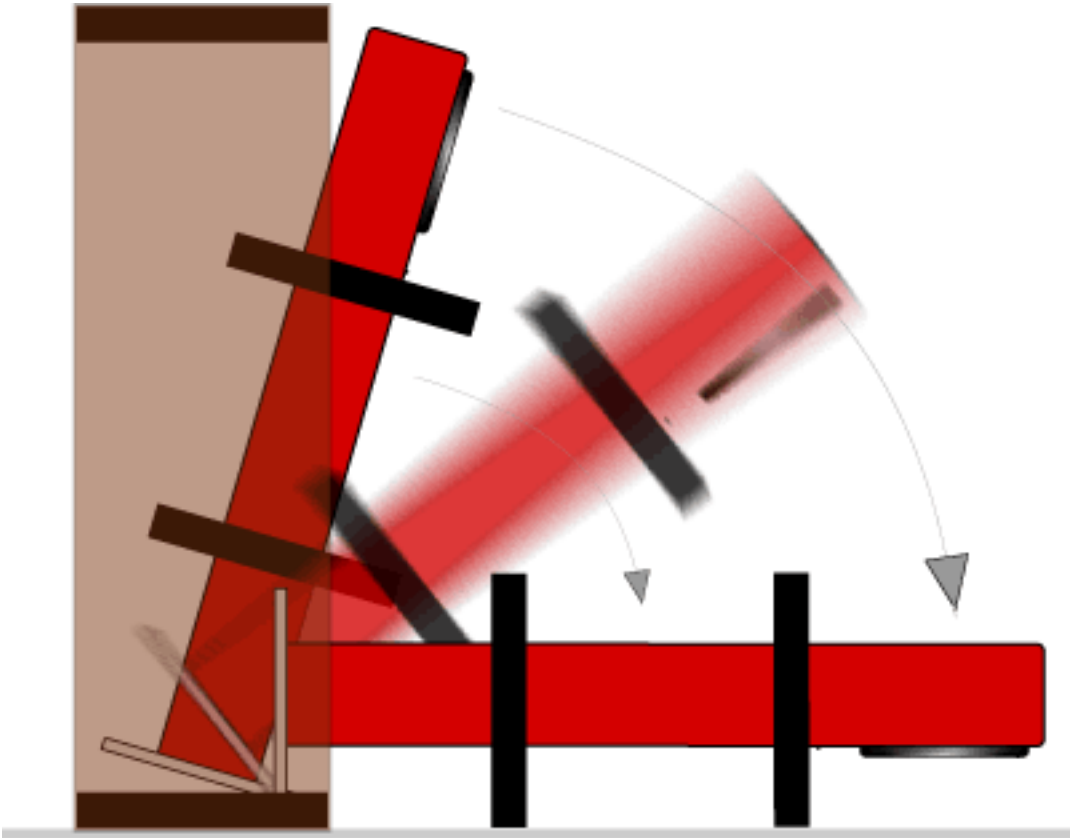
The Druid enclosure is expressed, on a fundamental level, like that of a waveguide with uniform cross section and terminated and driven at one end. Propagation within the Druid is mostly planer and standing waves are not stimulated. Power radiation from the open end is expressed similarly to that of a standard open-ended pipe, driven and terminated from the opposing end. Though similar, the Druid cannot be fully defined by waveguide, loudspeaker transmission line or driven pipe models. Development of an acoustical model accounting for driver introduced dynamic variables and resulting model changes revealed areas of non planer propagation. The resulting turbulence is wavelength relational and proportional to amplitude.

Applied to loudspeaker design, the new Grieve\* model shows resulting noise distortions, in varying degrees, throughout the entire audible range. Modifications within and to an audio waveguide that improve loudspeaker are proprietary, the basic idea being to minimize or eliminate non-planer oscillatory propagation.

\*The enclosure acoustic design principles used in the Druid are based on Ron Grieve's research and resulting patents. Ron has granted Sean Casey permission to use his research and collaborated on the fundamental application to loudspeakers. Ron Grieve was the editor and chief of Cycle World magazine for fourteen years and has worked as an engineer for several motorcycle manufacturing companies.









ZU AUDIO  
Ogden, Utah, USA

DESIGNED AND MADE BY US