with Pp and Ppk for process control and best fit to average for choosing golden units for production testing.

Dual channel analysis allows any signal to be used as the stimulus, including music or speech, as it measures the stimulus as well as the response to ensure accurate comparison. Transfer functions, impulse response, all associated cross-spectra functions such as coherent and non-coherent power, signal-to-noise, can be accurately measured.

Version 6.1 also offers significant advances in the user interface, particularly the sequence editor. The sequence editor now features "explorer-style" tree navigation that makes it easier to see configuration information and navigate complex sequences. You can export sequences and step configurations to text files or Excel for documentation purposes. The analysis editor now offers the option of detailed or simplified display options so that you can choose to see all the available options or a condensed menu ideal for production line testing operators. For more information on the Listen Inc. SoundCheck software, contact Listen Inc., 450 Harrison Avenue, Suite 307, Boston, MA 02118, (617) 556-4104, Fax: (617) 556-4145, e-mail info@listeninc.com, or visit the Listen Inc. website at www.listeninc.com.

SM Audio's Voice Coil Worksheet

Steve Mowry, an industry consultant and frequent contributor to *Voice Coil*, is making available a free beta version of his "Voice Coil Worksheet" Excel program on the SM Audio website, www.s-m-audio.com/SM AUDIO VOICE COIL WORKSHEET.xls. You can use this voice coil design tool to quickly and accurately configure voice coil properties for any application. The spreadsheet inputs include wire packing factor, wire size and type, either insulation thickness or Brown and Sharpe standard, min/nom/max wire conditions, DC resistance, number of layers, bobbin and bond coat thicknesses, and voice coil inside diameter. Wire and adhesive masses, inner/outer/average wind height, outside diameter, and stacking factor are automatically calculated. You can model both rectangular and round magnet wire voice coils.

The worksheet also outputs a voice coil sample sheet in an easy-to-read tabular format along with a reference drawing that you can print and send directly to the voice coil supplier. Steve has used this tool for several years and says he could not live without it. The "Voice Coil Worksheet" is available for download at no charge from s-m-audio.com. There are no limitations on its use, either commercial or personal; however, SM Audio assumes no responsibility for any damage caused by use or misuse. SM Audio has carefully scanned the file and it is virus free. Report any bugs to Steve at steve@s-m-audio.com/.

Magnetizers from Walker Scientific

Walker Scientific Inc. of Worcester, Mass., has introduced a new series of industrial-grade capacitor discharge magnetizers for high-volume production magnetization of samarium cobalt (SmCo), neodymium-iron-boron (NdFeB), ceramic ferrite, or alnico magnetic materials. The Model 6600 Series Capacitive Discharge magnetizers, capable of cycle times as low as 3 seconds, are intended for applications in which high volume manufacturing is required for loudspeakers, microphones, magnetic sensors, or DC motors. All models in the new line utilize custom-designed water-cooled magnetizing fixtures and are available in energy levels ranging from 1kJ (kilojoule) to 60kJ with an adjustable voltage range of 35V to 600V.

You can order these magnetizers with an external programmable logic controller with an optional PLC interface, multiple fixture operation, and polarity reversal. Custom charging fixtures and workstations are also available with pneumatic part loading/unloading and automatic magnetization of the customer's end product. Quality control options offered include peak field monitoring and/or magnetic field measurement.

Pricing for this new series of magnetizers depends upon the configuration and fixture requirements. For additional information, contact Walker Scientific Inc., Rockdale Street, Worcester, MA 01606, (508) 852-3674 ext. 515, (800) 962-4638, Fax: (508) 856-9931, e-mail info@walkerscientific.com, or visit the Walker Scientific website at www.walkerscientific.com.

New OEM Coax Driver from Renaissance Audio Group

Renaissance Audio Group (formerly Morel USA) released a new 8″ coax driver, the UniDrive-8, which utilizes a double magnet motor system for the woofer. The cavity of the woofer motor doubles as the acoustic chamber for the 1.1″ silk soft dome tweeter. Mounting depth is a very shallow 69mm (2.7″).

Woofer features include a polymer-treated paper cone, 3″ voice coil wound with hexagonal aluminum wire, and a 38Hz resonance. The tweeter incorporates a 28mm voice coil also wound with hexagonal aluminum wire driving a treated silk dome. For more information on this and other Renaissance Audio Group drivers, contact Renaissance Audio Group, 414 Harvard Street, Brookline, MA 02446, (617) 277-6663, FAX: (617) 277-2415, e-mail car.speakers@RenAudio.com, or visit the Renaissance Audio Group website at www.renaudio.com. *VC*

Test Bench

Renaissance Audio Tweeter and B&C Midrange

By Vance Dickason

This month's drivers come from high-end and car audio OEM supplier, Renaissance Audio Group, and Italian prosound driver manufacturer, B&C. From Renaissance Audio Group, *Voice Coil* received a new 1.1″ soft dome tweeter —the MST-296v, and from B&C, a new prosound neodymium motor 6″ midrange—the 6MDN44.

The MST-296v incorporates a number of features you would expect in a high-end dome tweeter: a 1.1 treated fabric dome, compact 3.63″ diameter aluminum faceplate,

28mm voice coil wound with copper wire on an aluminum former, damped vented pole and damped rear cavity, and gold-plated terminals.

I began testing by using the LinearX LMS analyzer to produce the impedance plot shown in ***Fig. 1***. The primary resonance is low for a 1″ dome and occurred at about 665Hz (same as the published factory spec) with a Q of 1.0 for the 5.1Ω voice coil DCR. Following the impedance measurement, I recess-mounted the tweeter in an enclosure that had a baffle area of about 15″ × 6″ and measured the on- and off-axis frequency response at 2.83V/1m. ***Figure 2*** depicts the on-axis response. Overall response was reasonably flat and is ±2.8dB from 3kHz-20kHz. The off-axis response seen in ***Fig. 3*** is very good and is typical of a 25-28mm soft dome.

Using the Clio analyzer with the tweeter recess-mounted on a large 4′ × 2′ baffle produced the cumulative spectral decay plot (waterfall) given in ***Fig. 4***. ***Figure 5*** shows the two-sample SPL comparisons indicating the two samples submitted by Renaissance Audio Group were nicely matched. For more information on this and other Renaissance Audio drivers, contact Renaissance Audio Group, 414 Harvard Street, Brookline, MA 02446, (617) 277-6663, FAX: (617) 277-2415, e-mail car.speakers@RenAudio.com, or visit the Renaissance Audio Group website at www.renaudio.com.

Like many of the B&C drivers recently reviewed in *Voice Coil*, the 6MDN44 uses a neodymium magnet to keep the weight to a minimum, which in this case happens to be about 2.2 lb. Rated at 300W continuous (3dB greater than the nominal power rating that is determined by a 2-hour pink noise test) with a 96.5dB rating, this pro mid should find use not only in three-way configurations, but also in line source arrays. Built on a proprietary cast frame, the 6MDN44 incorporates a coated curvilinear cone with a 2.25″ diameter coated paper dust cap. Compliance is provided by a 0.25″ wide two-roll pleated and coated cloth surround and a 3.5″ diameter cloth spider.

Driving the cone assembly is a 44mm (1.7″) diameter voice coil wound with aluminum wire on a glass fiber former. The

FIGURE 1: Renaissance Audio MST-296v free-air impedance plot.

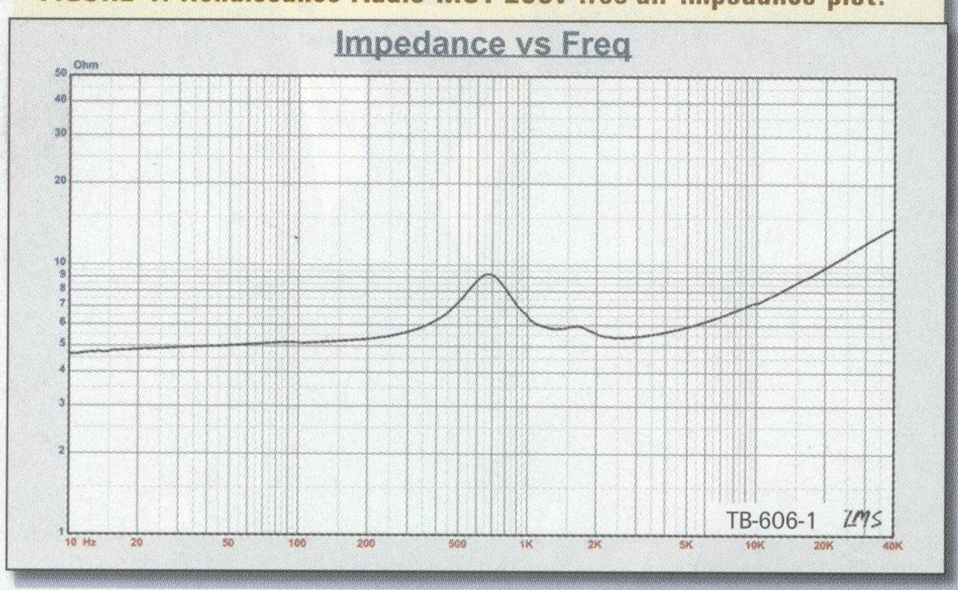


FIGURE 2: Renaissance Audio MST-296v on-axis response.

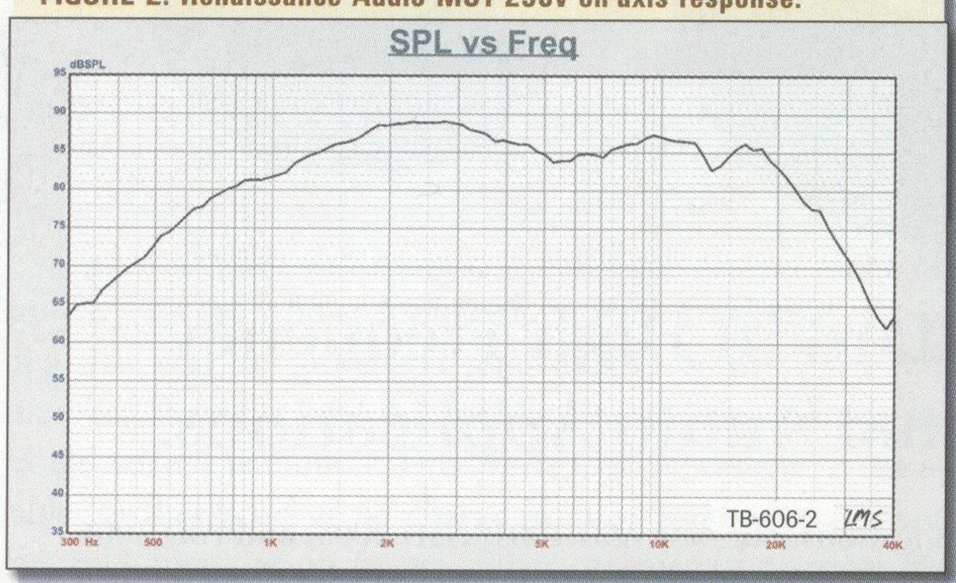


FIGURE 3: Renaissance Audio MST-296v horizontal on- and off-axis frequency response (0° = A; 15° = B; 30° = C; 45° = D).

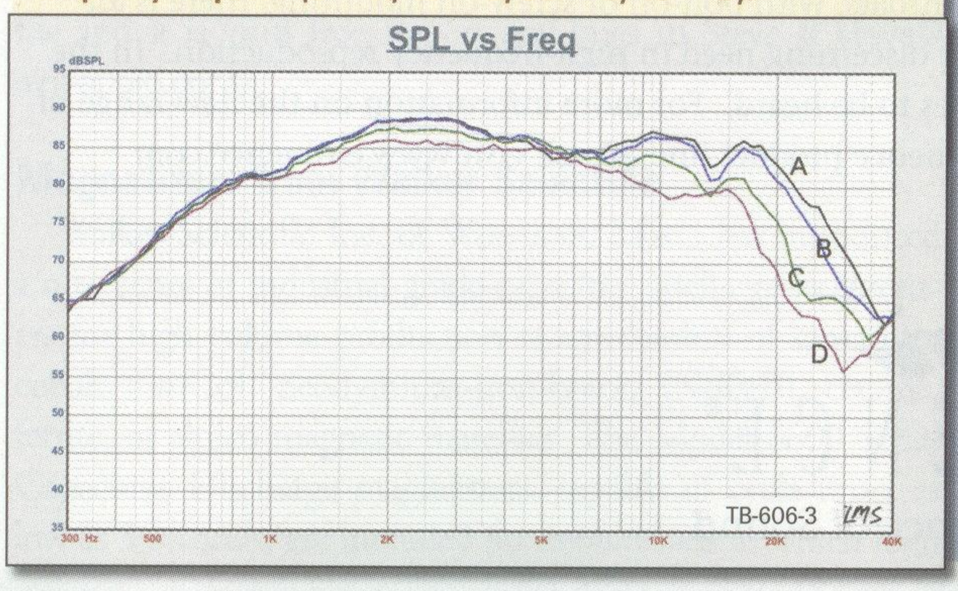


FIGURE 4: Renaissance Audio MST-296v cumulative spectral decay plot.

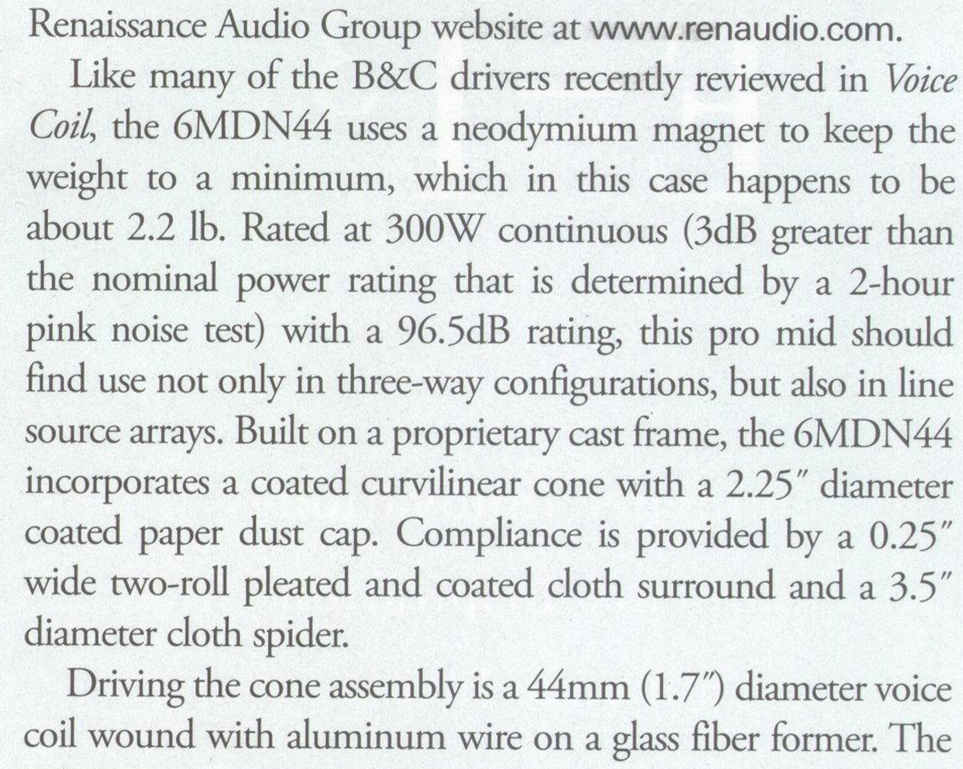


FIGURE 5: Renaissance Audio MST-296v two-sample SPL comparison.

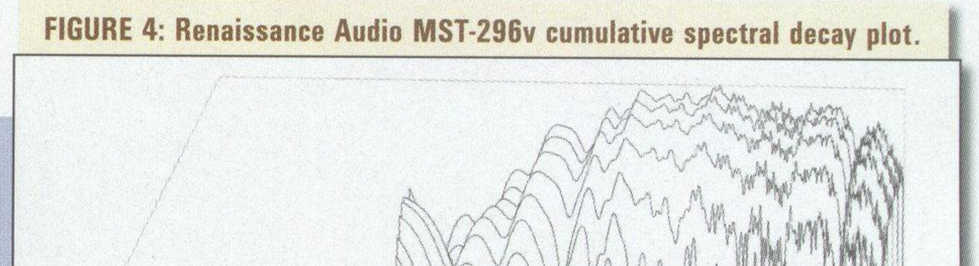
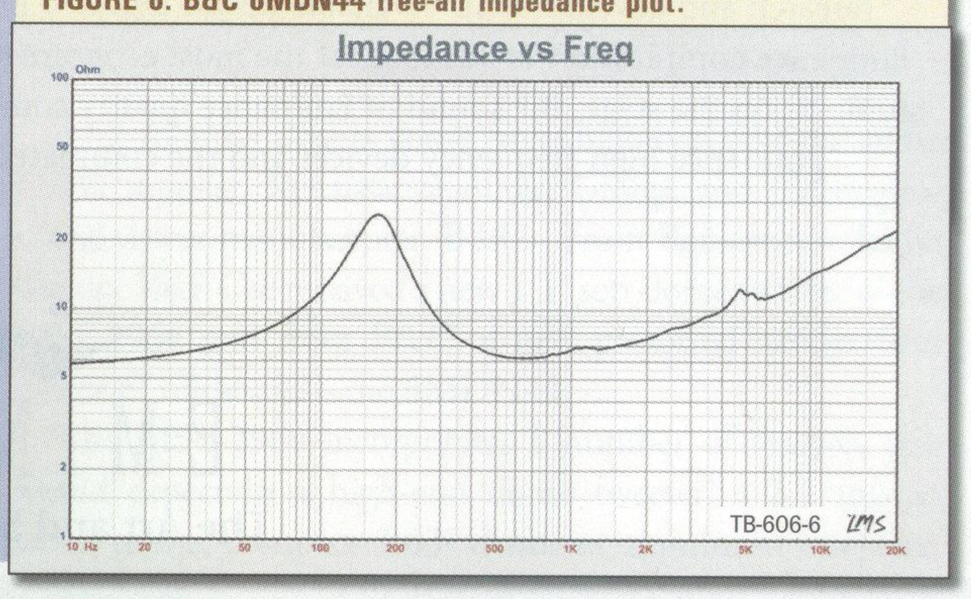


FIGURE 6: B&C 6MDN44 free-air impedance plot.



motor utilizes a neodymium ring magnet with a vent hole that looks like a conventional pole vent. This vent provides a convection-cooling thermal path to the voice coil area. Distortion is minimized with an aluminum demodulating (shorting) ring.

I began testing the B&C 6MDN44 by rigidly mounting the driver in free-air and taking both voltage and current (admittance) measurements at 1V, 3V, 6V, 10V, and 15V. I used the physically measured Mmd that was provided by B&C (an actual physical cone assembly measurement with 50% of the surround and spider removed) rather than a single 1V added (delta) mass measurement. Fifteen volts proved to be too high a free-air voltage for LEAP 5 to get an accurate curve fit, so I dropped it from the final parameter calculation. I then processed the remaining eight stepped sine wave voltage and current curves and divided the voltage curves by the current curves to produce the impedance curves.

Following my usual protocol for Test Bench testing and because most manufacturing data is being derived using a standard model or the LEAP 4 TSL model, I also produced a TSL parameter set using the 1V free-air curves to provide more familiar data to go with the manufacturer's specs. I copied both parameter sets—the multiple voltage impedance curves for the LTD model (see ***Fig. 6*** for the 1V free-air impedance curve) and the 1V impedance curves for the TSL model—into the Transducer Derivation menu in LEAP 5 and calculated the T/S parameters for the computer box simulations. ***Table 1*** compares the LEAP 5 LTD and TSL data with the factory data.

As is usually the case between my data and B&C pub-

FIGURE 7: B&C 6MDN44 computer box simulations (A = sealed at 2.83V; B = vented at 2.83V; C = sealed at 50V; D = vented at 35V).

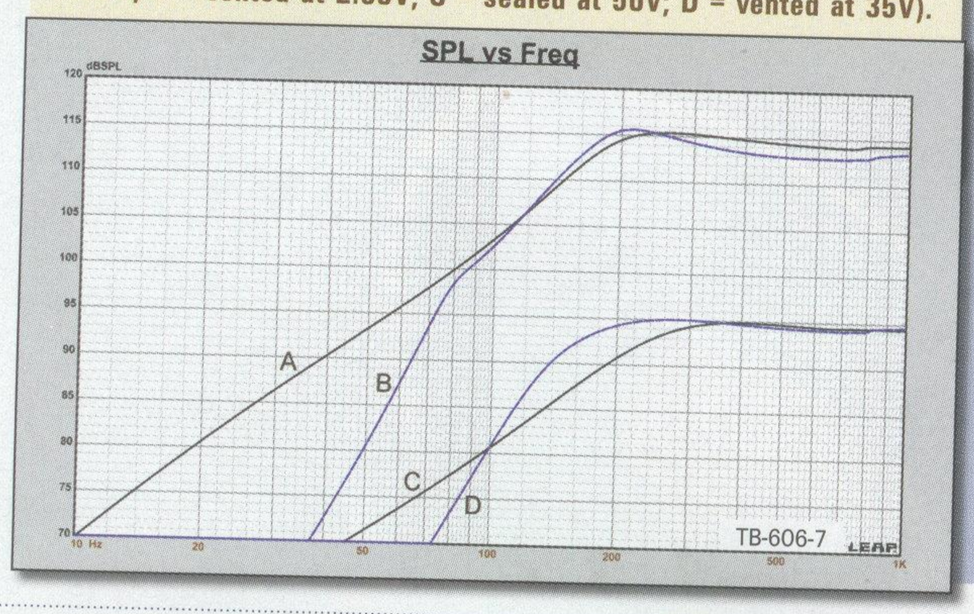


FIGURE 8: Group delay curves for the 2.83V sealed box (A) and vented box (B) curves in *Fig. 7*.