Building a Speaker Testing Turntable

A simple DIY turntable can make speaker testing easy and accurate.

PHOTO 1: Lazy-Susan bearings.

Testing speakers requires taking measurements both on-axis and off-axis. You can do so by moving the measurement mike, but the job is greatly simplified and accuracy is ensured with a testing turntable.

The heart of the turntable is the lazy-Susan bearing, which is available in various sizes both round and square framed (**Photo 1**). You can order them online or find them in most local hardware stores. A size between 6 and 10″ will do for all but the very largest pro-sound cabinets.

Along with the bearing, you'll need a 2 × 4′ piece of ½″ to ¾″ plywood. Cut the plywood into two 2 × 2′ pieces. Leave one piece square for the base, and cut the other into a 24″ circle for the top, using a jigsaw or a router and circle gutting jig. Drill a 1/8″ hole through the center of both pieces. Draw a line on the square piece from the center hole to one corner.

This is the zero degree reference.

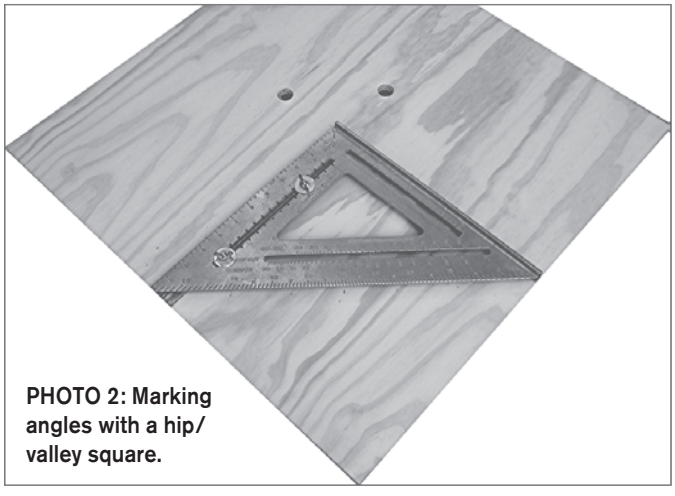

PHOTO 2: Marking angles with a hip/valley square.

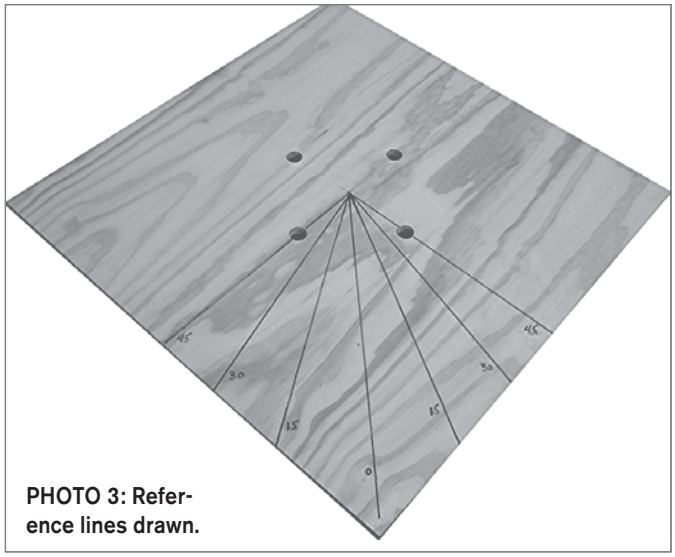

PHOTO 3: Reference lines drawn.

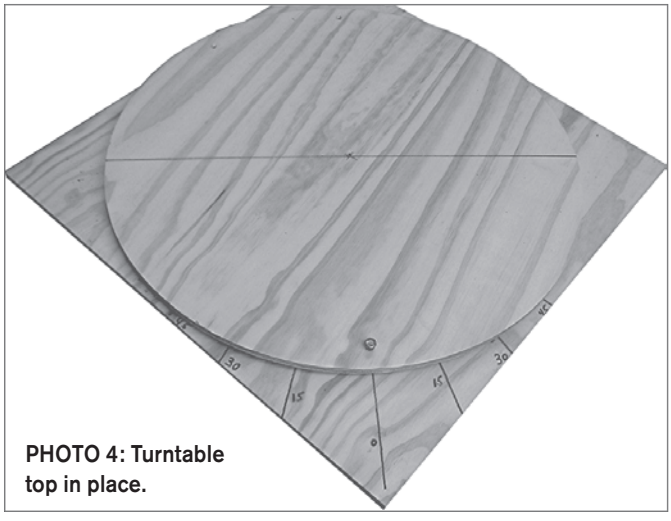

PHOTO 4: Turntable top in place.

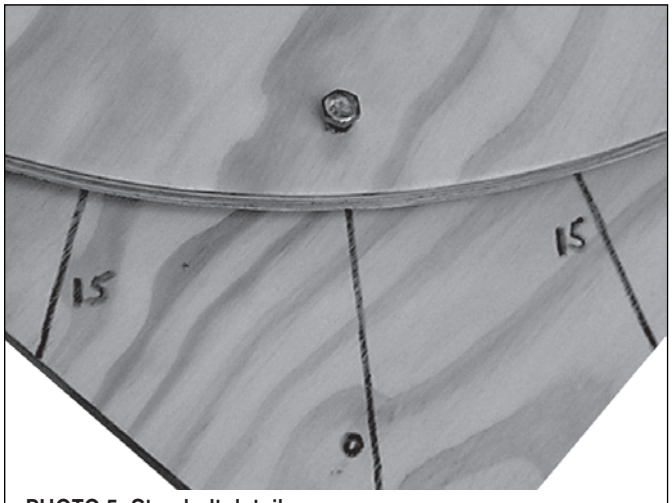

PHOTO 5: Stop bolt detail.

Using a protractor or a hip/valley square, draw additional lines radiating from the center hole at 15, 30, and 45° to either side of the reference (**Photo 2**). Draw and label the lines with a marking pen, so that they are easily visible (**Photo 3**).

Draw a line bisecting the top and then another line at a right angle to the first from the center hole to one edge. On the second line drill a ¼″ diameter hole about an inch from the edge. Install the bearing according to the instructions supplied with it. A nail inserted through the center holes in the base and top will align them for the bearing installation. Rotate the top, placing the hole over each of the reference lines on the bottom, in turn drilling through the hole into the bottom on each. A ¼″ bolt inserted through the hole will secure the top at each "stop" (**Photos 4** and **5**).

To render the top non-reflective, staple a half-moon-shaped piece of heavy felt carpet underlayment to it with its straight edge on the bisect line (**Photo 6**). To use the turntable, center the speaker atop the table, with the baffle on the bisect line (**Photo 7**). Place the meter/mike on the table reference axis. When rotated to the various angles, the center of the baffle remains at a constant distance from the meter/mike. Use carpet underlayment to cover the ground or floor between the turntable and meter/mike. For best results measure outdoors, away from any buildings or objects. *aX*

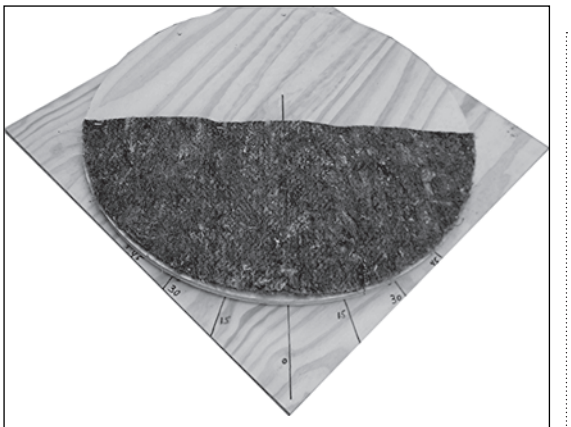

PHOTO 6: Felt carpet underlayment absorbs reflected waves.

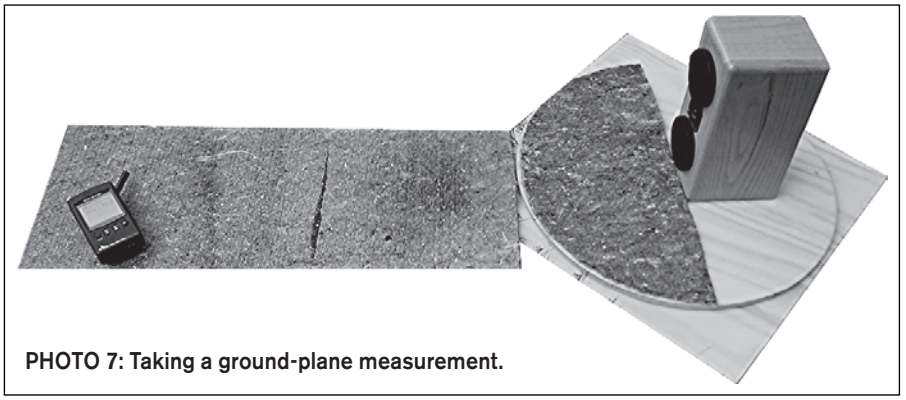

PHOTO 7: Taking a ground-plane measurement.