

SPICA TC-50 LOUDSPEAKER WITH SERVO SUBWOOFER

TC-50 dimensions: 13 by 16 inches (back), 11½ inches deep. Servo subwoofer dimensions: 17½ by 16 inches (top), 14½ inches high. Price: TC-50, \$450 per pair; Servo, \$595 each. Warranty: "limited," five years parts and labor. Manufacturer: Spica, 1601 Paseo de Peralta, Santa Fe, N.M. 87501.

These two products are designed to be used together as a full-range loudspeaker system, though they actually are sold separately. The TC-50 speaker—or satellite, in the full configuration—is triangular in cross section, with the grille running down the slanted front. Behind it are a 6½-inch acoustic suspension woofer and a 1-inch dome tweeter. The Servo is a floor-standing sealed enclosure, whose 8-inch driver, behind the front grille, is powered by a built-in amplifier designed by PS Audio.

Both the TC-50s and the Servo are available in true oak or walnut veneers. The TC-50s can be used alone as full-range speakers, if you like. To extend the bass, you can add either a pair of Servos—one for each channel—or use a single Servo summing the two. We chose the latter option for our tests.

The satellite/subwoofer hookup scheme is much more complex than average. The satellites stay attached to your main amplifier terminals, just as they do when they're used without the Servo.



But to derive a bass-only signal for the Servo's amp, and to keep the low frequencies from reaching the satellites, you must insert an adapter (Spica calls it a "passive interface") between your preamp and power amp. If you're using electronics in which preamp and power amp are combined into a single unit, without jumpers, Spica instructs you to have jumper connections added, rather than use tape-monitor connections.

The interface box is fitted with three pairs of pin jacks and a switch calibrated for amplifier input impedances of 22, 32, 47, 75, and 100 kilohms (22,000 ohms, etc.). If your amplifier's input impedance is significantly different from all of these values, Spica tells you how to rewire the box internally.

The catch in all of this is determining your power amp's input impedance; not all manuals list the appropriate specification. Worse, not only does Spica assume that the amplifier input impedance is purely resistive and that the preamplifier output impedance is very low (the only conditions that would make the capacitor-choice graph accurate), but it presumes that you know whether or not your amplifiers invert the polarity of signals that pass through them. In our experience, the large majority do not, but to be sure that the subwoofer and satellites are in phase after hookup, you may have to do some careful listening. If they're not in phase, you can reverse the "hot" and "ground" leads to the satellites. Spica also gives you instructions for reversing polarity of the subwoofer, which shouldn't be necessary unless you have ascertained that the satellites maintain absolute phase and you want to match the subwoofer to them. (The key question here is absolute phase relative to what, since recordings are far from consistent in their maintenance of polarity.) Deciding the correct satellite/subwoofer phase relationship is a problem with many three-piece systems, not just the Spica, but it is exacerbated by the unusual hookup requirements.

If you keep your electronics at some distance from your speakers, you'll have to run long line-level (pin-jack) leads to hook the Servo into the system. You'll also need AC power for the Servo's internal circuitry, which incorporates a cross-

over, its own amp (including a level control, on the back panel), and the servo feedback circuit after which the model is named. Besides these, the pairs of color-coded binding posts on the backs of the satellites, and electrical test points behind the subwoofer grille, there are no further connections or controls on the speakers.

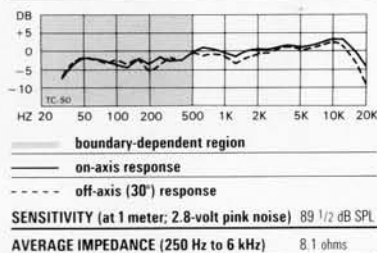
The test points are for use with an AC voltmeter, if you have one, to balance the Servo's output with that of the TC-50s. Spica supplies a cassette recorded with a sine wave at the crossover frequency (88 Hz). You play this tape, measure voltage at one TC-50, multiply it by 0.7, and adjust the Servo's amp to deliver, at the test points, an AC voltage equal to that product. If you don't have a voltmeter, Spica gives you instructions for doing the job by ear, which is how you should do your final balance trim anyway, even after meter-aided adjustment.

Because of the attention paid to phase response in the design of these speakers, Spica has very specific recommendations for their placement. They call for the satellites to be out away from any walls (though not the same distance from the back wall as from the sides) and raised on stands to the listener's ear level. The subwoofer goes between the two satellites. (Some other manufacturers suggest that as long as the crossover is no higher than 100 Hz, a subwoofer can be put just about anywhere in the room without harming the sound balance or stereo imaging, though this doesn't always work well.) The distance from the front edge of the subwoofer to the ideal listening position should be $4\frac{1}{2}$ inches greater than the distance from the front edges of the two TC-50s, which should be equidistant from the stereo seat.

Diversified Science Laboratories observed nearly all these recommendations in setting up for its tests. But DSL put the subwoofer—jumpered to function as one half of a dual-subwoofer setup—directly below the TC-50 used in the measurements. The whole, therefore, represented half of a dual-subwoofer stereo setup. The total system response obviously depends on the balancing procedure; the lower portion of the curve (presumably, below 88 Hz) could have been raised or lowered with respect to the re-



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mainder simply by changing the setting of the subwoofer's level control. Though DSL used Spica's voltmeter-assisted procedure, it could be argued that a hair more subwoofer level might have made the curves look a trifle better balanced.

As it is, however, the response is excellent. On-axis, it stays between $+3\frac{3}{4}$ and -4 dB all the way from 40 Hz to 20 kHz, and, except for some evidence of minor tweeter beaming at the very top end, does much the same off-axis. Even the usual floor-reflection dip fails to emerge unequivocally. There is a very gradual rise in response at high frequencies, however, and some listeners considered the sound slightly bright on certain instrumental recordings, though the effect disappeared when we switched to vocal music, which is reproduced very naturally.

Distortion is moderate (averaging about $\frac{1}{4}$ percent through most of the frequency range) when tested at 85 dB SPL (sound pressure level), but begins rising at 95 dB and averages about 3 percent at 100 dB. At lower test levels, however, there is far less distortion in the deep bass than we would expect to find in a conventional (nonservo) three- or four-way system. On 300-Hz pulses, the setup accepted without complaint the test amp's full output—the equivalent of $26\frac{1}{2}$ dBW (450 watts) into 8 ohms.

The TC-50's impedance is relatively constant, lying between 4.1 ohms (at

around 170 Hz, and again at 8 kHz) and 13.4 ohms at woofer resonance (just below 70 Hz). This should make it a comfortable load for solid-state amplifiers, though its broad 4-ohm minima (particularly the one in the midbass) would argue against paralleling these speakers with another set on a finicky amp. The subwoofer, being driven at line level, presents no load to the power amplifier; its

input impedance, which is driven by the interface, measures 100,000 ohms. Sensitivity of the TC-50 is about average among the speakers we test; because it's a small, sealed system, we would have expected it to be lower.

But what really matters where a loudspeaker is concerned is its sound. Despite the hint of brightness that some listeners heard on instrumentals, we

found the balance of the TC-50/Servo very natural. The imaging is excellent, as is the dynamic impact. And its qualities seemed to grow as the listening progressed. Although some will consider the involved setup process an impediment, others doubtless will enjoy it. To the skeptics, we can only say: Listen and see if you don't think the Spicas will be worth the trouble in the end. ●