

T S S

Hsu Research HRSW10 Subwoofer System

Manufacturer: Hsu Research, 20013 Rainbow Way, Cerritos, CA 90701

Price: \$750, price now includes variable-frequency passive crossover—not reviewed.

Source: Manufacturer loan

At the outset, I would like to make it clear that this should be considered a preliminary review because, even though I have only had a chance to audition these singularly *Sensible* subwoofers with one set of "full-range" speakers, the NHT 2.3 towers, their performance is so impressive for their modest price—or any price—I felt that we should get the word out about them as quickly as possible. I intend to audition them later on with smaller (and less expensive) satellite speakers.

The HRSW10 is the smallest in a line of three subwoofer systems made by Hsu Research, which, until sometime in 1992, was known as Definitive Research. The other two are the much larger HRSW12 and the Infra Bass system, whose performance (140 dB @ 10 Hz) and price (\$80K) are too frightening to even consider. The cylindrical enclosures are fabricated of approximately 1/4" thick recycled paper. The cylindrical shape, it seems, is ideal for a subwoofer enclosure because of its inherent immunity to cabinet resonances. The use of paper for enclosure material is also a good choice because of its natural non-resonance and excellent damping characteristics. The top plates are MDF with a choice of veneers. The review pair were the standard walnut, but optional extra-cost veneers are oak and lacquered rosewood. Dimensions are about 30" high with the four 2.5" adjustable bolt feet attached and 14.5" in diameter. Here, because the bolt heads are used for coupling to the floor, I would rather have seen spikes employed to provide better floor coupling.

As might be expected, with this shape and material of construction, the HRSW10s are of single-chamber, ported design, with the port running very nearly the entire height of the enclosure and venting on the bottom, directly across from the down-firing, long-throw woofer. This woofer features a vented pole piece and a 2", four-layer voice coil and is capable of a maximum excursion of +/- 10 mm (just a bit short of 1"). The HRSW10s are also, as might be expected, very light, weighing in at only 23 lbs. each.

The standard crossover is a 12 dB/octave low-pass type with a crossover frequency of 40 Hz, with a dual-mono configuration. Optional crossover frequencies, in 10 dB increments from 50

to 100 Hz, are available at \$30 extra. An 18 dB slope option and a level control are also available, and this is the format I ordered for use with the NHT 2.3s. The crossover is enclosed in a separate box which has speaker level inputs for connection to the speaker outputs of the main amplifier and RCA plug-terminated line-level outputs which plug into the input jacks of the subwoofer amplifier. The SW10s are, in turn, connected to this amp via sturdy, gold-plated five-way binding posts situated on the bottom edge of the enclosure about midway between the port and driver.

No, as you may have gathered from the above description, these are not powered subwoofers, and you will need a separate amp to drive them, but Dr. Poh Ser Hsu, the creator of this amazing system, claims that any amp or receiver of 40-300 W/channel rating can be used, but that even a 40 watt amp (or receiver) is sufficient to drive the SW10s to a level of 109 dB (1 meter) at 20 Hz. So just take that old Heathkit, Dynaco, or even Eico amp or Allied or Lafayette receiver out of mothballs and you're all set.

The impedance is listed as 7 ohms minimum and the frequency response is +/- 1 dB from 20 Hz on up, with the -3 dB (half power) points being at the crossover frequency of 40 Hz and cutoff frequency of under 15 Hz! The maximum output is 119 dB from 17 Hz up!

There are a few moderately priced full range speakers, such as the Amrita Allegras (TSS 47) and subwoofers that will reproduce frequencies down into the high 20 Hz region, but until now, reproduction of that last octave from 30 Hz down into the teens have been devilishly difficult to attain, generally requiring gargantuan enclosures, loaded with umpteen-inch drivers, with correspondingly outlandish prices. I had, therefore, resigned myself to the fact that I was never going to be able to hear the shudder of 16 to 25 Hz fundamentals from 32' organ pipes reproduced in my listening room, until I spotted a very small ad in the 1992 *Audio Annual Directory* for a pair of subwoofers for \$500 (alas, now \$750) that claimed to be flat (+ 1 dB) down to 20 Hz and below and were offered on a 30-day home trial basis.

In my experience, when something seems too good to be true, it usually is, so I was not expecting much when I called the number in the ad to request more information about these seemingly ideal subwoofers. Even after discussing with Dr. Hsu the nature of the passive crossover I would require for the best integration with the NHT 2.3s and requesting a pair for review, I was still apprehensive because, as you are surely aware, the addition of subwoofers to an existing system is an exercise fraught with pitfalls. If you are not aware of these inherent perils, rather than go into them here, I refer you to excellent

primers on the subject in issue #32 of TSS by Thomas J. Norton (Yes, that Thomas J. Norton. He used to be one of us) and Thomas A. Nounsaine (Yes, that TAN). You see, in this way I get to both shirk my duty to inform you and sell back issues of the magazine...

I will say, however, that the variable that concerned me most was the degree of integration with the NHT 2.3s. In theory, the match should be good, with the SW10s rolling off at 18 dB/octave starting at something under 40 Hz and the NHTs down 3 dB at 35 Hz. Well, it turned out that Dr. Hsu was right on the money, but before I tell you how seamlessly they integrated, I better describe their setting up and placement.

Ancillary equipment employed was as follows: Rotel 955, 965 and PEOGE 4+ Magnavox CD players, my upgraded version of "Aunt Corey's Buffered Passive Preamp," PEOGE 5 Philips DAC-960 DA converter with digital signal from both Rotel players and the Magnavox with added digital buffer circuit, Kimber interconnects, digital link and power cord, Adcom ACE 515 line conditioner, two JCA&E modified Parasound HCA-800 (80-90 watt/channel) power amps and, most importantly, the excellent NHT 2.3 speakers with AudioQuest F-18 speaker cable.

The actual hook-up is very simple. The speaker level inputs to the crossover box (about 6" X 6" X 2") are connected, along with the main speaker cables, to the binding posts of the main amp. The wires are color-coded for +(green) and -(blue). The line-level inputs from the crossover are then connected, via attached RCA plugs, to the inputs of the subwoofer amp. The Parasound amps were used for both main and subwoofer amps. At this point, I will voice my only complaints about this system. The aforementioned use of bolt heads instead of spikes is one. The others are that the speaker and line wires from the crossover box are of very fine gauge and flimsy in appearance and the line level pair are so short that, with larger amps, with the inputs set low on the case, the box would have to set behind the amp, making access to the level control something less than optimum. Even with the fairly low profile (9" height) Parasounds, the box barely reached the top of the amp chassis but, since the HCA-800s have their own level controls, this was not a problem in my particular set-up.

As to optimum placement, I apparently lucked out, because I found it to be just out of the corners of the room and about 3' diagonally behind the NHTs, which also happens to be fairly acceptable for the room decor and preservation of the domestic tranquility.

The first thing I did after setting them up was, as might be expected, to drag out every CD I have that contained significant sub-30 Hz and even sub-20

Hz information (including the one included with the system for demonstration purposes, Telarc CD-80097, which is the inaugural recording of the Ruffatti organ in Davies Symphony Hall in San Francisco, and has a wealth of sub-20 Hz organ pedal fundamentals) and indulge in an orgy of gut rumbling, window rattling shudders. The SW10s handled every outrageous noise I threw at them with aplomb, from the pure 16 and 18 Hz pedal notes of the 32' pipes in the second movement of Saint Saens Organ Symphony (San Francisco/de Waart/Guillou, Philips 412619-2) to various and sundry Telarc bass drum whacks to sound effect CDs.

The SW10s did balk, however, with a metallic squeak, at the railroad crossing sound effect band from the *Chesky Jazz Sampler and Test CD #2* at a 1 KHz level setting of only 75 dB at the listening position. Obviously, in this case, the primary component of the sound near the end of this cut was well under 15 Hz, because Dr. Hsu warns that the one drawback of this ported design is that the speakers are fairly easily overloaded by large signals, such as cannon shots, below the cutoff frequency of slightly under 15 Hz.

After the novelty of rutting around in the nether regions of the bass and sub-bass had worn off, I decided it was time to actually listen to some music and found that my concerns about the integration with the NHTs were for naught. There was neither a hole nor an additive boom in the critical 35-45 Hz crossover region, nor could I detect where the NHTs dropped out and the SW10s took over. A further concern about the possibility of the subs muddying up the tight bass and clean midrange of the NHTs was also allayed when I found that the overall sound seemed even more clear with them than without them.

Most articles on subwoofers state that there really is nothing much of interest below about 40 Hz except big organ pipe fundamentals. Not knowing any better, I had no reason to believe otherwise. But after listening to music in which there are no bass fundamentals under 60 Hz or higher, such as string quartets and piano trios, or even '60s rock, with the SW10s in the system I can say, without reservation, that this viewpoint is fallacious.

How can this be, you ask (undoubtedly preceded by an epithet involving taurine excreta). Well, as near as I can determine, the sounds lurking in the 20 and sub-20 Hz region are of two types: instrument subharmonics and hall rumble or hum. The first is easily understood. A plucked string, for example, generates harmonics that are both above and below the fundamental vibration frequency. The second, however, is more subtle. If you have ever been alone in a large auditorium or concert

hall you may have noticed a distinct rumble and further, that each venue possesses its own characteristic set of reverberations in the bass region that contribute to the venue's unique "sound." In addition, with large symphony orchestras, there is something, which TJN in the above cited T&S articles calls the "hum of the orchestra." So, in addition to the floor-shaking organ pedal notes, there is a plethora of information in the bass and infra-bass region that contributes greatly to the enjoyment of reproduced music by instilling in the listener a sense of "place," presence, and an almost tactile realism. In short, if you want to experience real ambience, you need to reproduce the frequencies under 40 Hz at a realistic, not just a suggestive, level.

I intended to cite several of the many possible examples of the palpability (There. I used that word again!) added by the SW10s, but in the interest of keeping this review down to a manageable length, I will give only one absurdly extreme illustration.

I recently purchased the Telarc recording of Handel's *Concerti Grossi, Op. 6, 1-6* (Boston Baroque, CD-80253) simply to hear the marvelous acoustics of the 135-year-old Mechanics Hall in Worcester, MA, with the SW10s in the system. Now even though the instrumentation on this recording is simply a small, original instrument chamber ensemble, I heard, or rather felt, a floor vibration during the first concerto which, the first time I experienced it, I chalked up to a wayward truck rumbling past our house. However, after repeated listenings, I determined that the rumble was on the recording at about 45 to 48 seconds into the fourth movement. I then called Telarc to inquire about this phenomenon. A young fellow named David Bower confirmed that it was, indeed, on the recording and was caused by a heavy truck lumbering by on a street just outside the hall and was unavoidable.

With the associated equipment listed above and in my particular listening environment, I found that at a reference level of about 70-75 dB with a 1 kHz test tone, that with the exception of only a few CDs, the maximum setting of the level control on the crossover box was ideal. This is, however, a very moderate level and at higher levels of the main amp, this maximum subwoofer setting might be too high.

By now it should be obvious that I am pleased—no, make that elated—with the performance of the HRSW10 subwoofer system with the full-range NHT 2.3s. The bottom line is that if you are happy with your present full-range speakers with bass extension down to about 35-45 Hz, but would like to build under them a solid sub-bass foundation and hear the wealth of deep bass and ambi-

ent information you have been depriving yourself of, you should order a pair of HRSW10s immediately, if not sooner. With a 30-day return policy, what do you have to lose? I say this knowing that there will be some who will seek to abuse this policy by ordering a pair just for a cheap, fleeting thrill, because I would be willing to wager a sizeable sum that, once you have heard what they can add to your system, you won't want to part with them. I know I'm not going to part with the review pair. Ecstatically recommended!

- GDB