

The \$ENSENIBLE Sound

Electronically reprinted from November/December 2001, Number 88

SV Subwoofers 16-46PC Subwoofer

Manufacturer:
SV Subwoofers LLC, 590
Carlin Drive, Austintown,
OH 44515;
www.svsubwoofers.com
Price: \$849
Source: Manufacturer loan
Reviewer: Howard Ferstler

These days, I am convinced that only two things can make significant improvements in the sound we get from even very good, traditional, two-channel audio systems: the addition of surround sound (meaning more speakers, more amplifiers, a good surround processor, and of course recordings that can take advantage of that configuration), and (assuming that the system owner does not already have two really huge, ultra-powerful speaker systems that deliver flat bass well into the bottom audible octave) the addition of a really potent subwoofer system.

This review is about the latter option (those interested in the former may check out my past and contemporary reviews of assorted surround processors and receivers for some specifics), and it will concentrate on the SVS 16-46PC subwoofer, which is a formidable piece of work from just about any angle.

The 16-46PC is similar in concept and appearance to the Hsu line of cylindrical subwoofers, although this particular



SVS job is a bit shorter and thicker than the Hsu TN1220HO I reviewed in Issue 67. The actual size is a bit over 16 inches in diameter and 46 inches tall. The model number reflects the tuning frequency and enclosure height.

The advantage of a cylindrical enclosure is that the walls of the subwoofer cannot flex or bend, because there is no curved shape for them to flex or bend into. The end caps also cannot flex much, because one mostly contains the driver (which is supposed to move, anyway) and the other is made quite rigid by virtue of a large port assembly in the center.

Like the TN1220HO, the 16-46PC has a 12-inch driver, although the design arrangement is 180 degrees different

from what we have with the Hsu. With the latter, the woofer driver is on top and the port is on the bottom. With the SV subwoofer, the driver is on the bottom, facing downward, and the port is on the top, aimed at the ceiling. Locating the driver on the bottom makes the unit significantly less top-heavy than the Hsu subwoofer.

One problem with the TN1220HO as delivered was that the upward-facing woofer had no protective screen cover, and so you had to go to a place like Radio Shack and pur-

chase one yourself (the Hsu manual suggested this if you insisted on a cover) and then install it in such a way that it would not vibrate obnoxiously. Hsu no doubt feels that any grille screen would be a potential source of extraneous vibrations, but the fact is that most people would want at least some kind of protection over an upward-facing woofer.

In my case, I fully expected to find one of my cats curled up in the cone area one morning (the unit is next to a bookcase the top of which any normal cat could jump to, and from the bookcase to the top of the sub enclosure would only be a modest leap), and so I installed one of the spare plastic grill screens that had originally been designed to cosmetically protect each of the woofers in my full-range Allison IC-20 systems.

There is no such protection problem with the SV sub, not only because of the downward-facing woofer, but also because the largish port area on top is protected by a very sturdy metal grille screen. You do not have to worry about cats or big bugs getting inside of your 14-46PC via the port tube. Nor do you have to worry about some heavy object falling off of a shelf above the unit (if it is in a corner or up against the wall) and plunging into the tube or punching out a cone. The sub is pretty resistant to casual damage.

The upward-facing port tube itself is a long, 4-inch-diameter job that is flared on both ends to minimize turbulence. In addition, rather than have the woofer aim downward into the flooring or carpeting underneath the system, the SVS enclosure has a solid bottom plate separated from the woofer baffle by a trio of fixed, 2-inch standoff spacers that insure that the woofer will be fairly well protected. The driver's direct signals exit from the opening clear around the bottom of the enclosure.

The plate itself comes with tough little rubber pads on the bottom, and those should work fine for both bare-floor and carpet placement. (The pads also cover the recessed screws that hold the bottom plate to the main enclosure.) If the tall enclosure leans slightly away from perfect vertical after being set up on carpet (a potential problem with all tall speaker enclosures), you can use home-made cardboard shims to get it to true vertical.

There are actually two different 16-46 models. The basic version, the 16-46CS (CS stands for cylinder series), is a sub only, and it must be powered by an outboard amp. (Tom Nousaine reviewed the smaller 20-39CS version in Issue 86.) SVS offers such an amp, a 350-watt job, but the user can also use any other amp he or she wants, because unlike a lot of other upscale subwoofers, neither 16-46 model absolutely requires equalization down really low. These systems reach their bottom limits by virtue of their large sizes and port tuning. According to SV, the unpowered CS model can get just a bit deeper into the deepest bass than the PC version, because the lack of an on-board amp means there is a bit more space inside of the enclosure. Anyway, more on this lack of equalization, up ahead.

The 16-46PC version reviewed here (PC stands for "powered cylinder"), has a built in 190-watt amp that allows the subwoofer to be hooked up in the traditional subwoofer way. This can include a direct, line-level feed from a receiver or processor's "subwoofer-out" jack, or can involve using the subwoofer's own on-board crossover. With the former option, you simply set the sub's crossover-bypass switch so that input signals go directly to the internal amplifier. This kind of subwoofer-hookup feature is common with today's subwoofers, thanks to home theater.



The amp is built into a recess in the back of the cylindrical enclosure, and when the unit is turned around to face into the listening area, it is not visible. Most of the amp surface is covered by a largish heat sink that never got warm during my auditioning process, even when playing two different Bass Mekanik demo/test discs.

There are actually two ways to make use of the subwoofer's own crossover. One involves the use of a line-level hookup, which has a fixed, 6-dB-per-octave, high-pass filter at about 100 Hz in combination with a variable low-pass filter working at 12 dB per octave. I measured the electrical output of the high-pass section, and it closely paralleled what I had previously measured from a Velodyne FSR-12 subwoofer when the latter's 80/100 filter was set to its 100-Hz high-pass setting. The rolloff began at about

200 Hz, and was down about 3 dB at 100 Hz and about 6 dB down at 50 Hz.

The low-pass filter's range of adjustment is 50 to 150 Hz, and you can use the control to dovetail the sub's bass output with the high-pass section as the latter interacts with the natural rolloff of the satellite speakers one has and the acoustics of the listening room.

The second hookup option involves speaker-level, five-way binding post connections, which you would use if you had a receiver that had neither a line-level subwoofer output, nor preamp-out and power-amp-in external jumpers. These offer a fixed high-pass filter at about 100-125 Hz (the exact frequency will depend in part on the impedance of the satellite speakers), and the same low-pass filtration and adjustment range as the line-level inputs.

Needless to say, I favor either the subwoofer-out hookup option or the line-level in/out alternative. Speaker-level hookups are a last resort, in my opinion, and are not something that serious audio buffs would fool with.

The amplifier offers several other features. First, of course, it has a gain control that allows you to balance the sub's level with that of your satellites. Second, it has a continuously variable phase control (0-180 degrees) that might come in handy, although a simple 0-180 toggle switch would probably work as well. Third, it has a three-position switch that allows for a nominal flat output or two boost modes that reach their maximums at about 30 Hz. One setting bumps the output by about 3 dB and the other boosts it about 6 dB. The switch has only a slight effect on signals

below about 25 Hz, which means that its use would mainly involve goosing the low-bass output for movies, rather than super-duper pipe-organ music with plenty of sound below 25 Hz.

The amplifier also includes the now ubiquitous “off/on/auto” switch, with the latter setting allowing for the input signal to switch the subwoofer amp from its standby mode to full “on.”

A detachable, two-prong cord supplies power to the unit, and the amp is protected by a 4-amp fuse that is user replaceable. There is also a 120/220 voltage-choice switch on the back to facilitate overseas operation of the unit.

The 16-46PC enclosure is wrapped in a thick, velvet-texture black cloth that feels good to the touch. It feels so good that five minutes after I unpacked the test unit and sat it in a corner of my room one of my cats was doing some surface evaluating of her own. The stuff seems tough enough, because she did no visible damage at all. No telling how things would work out in the long term, however.

While the SV subwoofer certainly does not look like your run-of-the-mill low-bass reproducer, its resemblance to a black water heater might prove unsettling to some. It shares this visual exclusivity with the Hsu TN1220, although it looks more like a “real” black water heater than the taller and skinnier Hsu. How a typical spouse will react to the style is anybody’s guess, but my better half kind of liked it looks, or at least did not faint dead away when she first saw it. Well, she already has learned to live with my TN1220 in one corner of the main-system room and a Velodyne F1800RII in the other. She thought the velvet covering was nifty, by the way.

Hooking up the 16-46PC was ridiculously easy. I simply swapped it with my Velodyne F1800RII, set the bass level with the aid of my AudioControl SA-3051 RTA, and that was it. I left the phase control set at 0 degrees, and everything blended together marvelously.

My initial signal source was an uncorrelated pink-noise test signal, to see just how the sub compared to the F1800. I have measured the latter in conjunction with my Allison IC-20 main speakers and my Yamaha DSP-A1 processor/amp many times. This procedure involves a moving-microphone technique (to minimize the effects of standing-wave interactions) and the integration of all input signals by my SA-3051 over a 20-second measurement period.

Overall, the response was identical to what I get with the F1800 down to about 35 Hz, with the Velodyne ending up about 3 dB louder at 31.5 and 5 dB louder at 25 Hz. I also took some fixed-position measurements down to 20 Hz (using the SA-3051’s digital-readout option), and at that

frequency the F1800 was about 5 dB louder than the 16-46.

I also checked out the response with the boost switch set to both the +3 dB and +6 dB positions. With those settings, the SVS was equal to or slightly louder than the Velodyne down to about 28 Hz, with the F1800 again pulling into the lead below 25 Hz, even with the +6 dB setting. This agrees with the SVS owner’s manual, which noted the boost’s 30-Hz center frequency. The manual indicates that if the sub is to be played at very high levels, the 0-level setting is the best choice.

Speaking of the owner’s manual, I will have to admit that it is one of the better-written pieces of consumer-oriented, audio-instruction and product literature I have encountered. The booklet is both candid and helpful, and it even includes a list of killer-bass DVD movies that will show off what the subwoofer will do, as well as a glossary of audio and home-theater terms. The instruction package also comes with a “quick start setup” sheet for those in too big a hurry to read through the manual.

The manual stresses the home-theater abilities of the 16-46 more than its musical capabilities. However, there is no reason to panic, because the 16-46 is more than able to very effectively deal with serious musical source material. I would imagine that the literary emphasis on movie-sound reproduction is the result of home theater being a much bigger market than music-oriented home audio.

I followed up my frequency-response measurements with some maximum-output tests that compared the unit to several other subwoofers I have reviewed in the past. As usual, I positioned the subwoofer in the left-front corner of my listening room and located my microphone at my normal listening position, about 17 feet from that corner. I then switched my AudioControl SA-3051 RTA to its digital-readout mode, which allowed me to measure fixed-frequency signals to one-tenth dB resolution.

When feeding in a continuous 31.5 Hz signal, the 16-46PC managed to get up to 113 dB, and do so very cleanly. It was kind of hard to tell just how clean, because at that output level the entire listening room was vibrating considerably, and the wall-mounted, left-front surround speaker (located about two feet above the subwoofer’s port mouth) was making substantial noise all by itself, as it vibrated against the foam pads that hold it off from the wall. The subwoofer was cleaner sounding than any other object in the room at this level, and I had to walk right over to it and listen close to hear any negative artifacts.

As a point of reference, I will note that I have only managed to generate louder signals at the 31.5 Hz frequency with two other subwoofer systems: my own



F1800RII Velodyne and the dual-subwoofer modules of the Waveform MC/MC.1 sub-sat system (the latter reviewed in issue 84). Those units could hit 114 dB at 31.5 Hz.

On the other hand, virtually every other subwoofer I have reviewed, including the Hsu TN1220HO and the Paradigm Servo 15 (the latter reviewed in issue 71), both of which could hit 112 dB, fell short of the 16-46's elevated output. Even a \$2500 Velodyne HGS-15 I happened to have on hand at the time could only hit 110 dB, and the \$1000 B&W ASW 2000 (reviewed in issue 73) could only get a bit past 108 dB.

The performance at 20 Hz was not quite so impressive, but I could still manage to get an honest and clean 102 dB out of the unit. Almost 107 dB was possible with no apparent stress to the driver, although port wind noise was clearly audible at that level. As a point of reference, the Velodyne F1800RII, Hsu TN1220HO, and Paradigm Servo 15 could each hit 110 dB at that frequency, with minimal distortion. So, down that low the SVS was not quite in the same max-output class as the best of the best.

Still, 102 clean dB at 20 Hz is not chopped-liver performance, and at that level the listening room was vibrating aplenty, adding in considerable artifact-rattling noise of its own. The 16-46's maximum-output ability at 20-Hz was only a couple of dB shy of what the Velodyne HGS-15 could deliver, or what my two Allison IC-20 main systems can deliver if I run them without a subwoofer, and was greater than what the Waveform MC sub, B&W ASW 2000 sub, or a pair of full-range Dunlavy Cantatas could cleanly generate down that low.

Of course, test signals are not what we really listen to when we play with our systems (well, maybe I am an exception, here), and so I made use of several bass-potent, musically significant recordings to see just how the unit compared to a few reference subwoofer models I had on hand. One of those was the above-noted Velodyne HGS-15, and when I did some quick-switch comparisons (level matched at 50 Hz) it was impossible to tell which subwoofer was playing if the musical content (or test signals) were at 30 Hz or higher. At lower frequencies, you could tell a difference in terms of output levels (the HGS-15 was somewhat louder), but as far as the purity of the sound was concerned the two subwoofers were subjectively the same at normal listening distances.

Musical source material with extremely low-frequency program content, such as Mendelssohn's Organ Works (Argo 414 420) or St. Saëns Third Symphony (Philips 412 619) showed the Velodyne to be superior at the very bottom end. However, recordings that had deep and powerful bass mostly down to "only" 20-30 Hz were not quite so revealing of differences. Those included Respighi's Pines of Rome (London 410 145), The Very Best of Erick Kunzel (Telarc 80401), Duruflé's Requiem (Summit 134)

and Suite, Op. 5 (Telarc 80136), John Rutter's Requiem (Reference Recordings 57CD), Dupré's Symphony in G Minor (Gothic 49083), Enya's Watermark (Geffen 24233), and of course Bass Mekanik's musically "interesting" Quad Maximus (Pandisc 8848).

At some times, it appeared that the HGS-15 would slightly outpoint the 16-46PC, but those times were few and far between, and those differences would only be noticeable with direct, level-matched, rapid-switchover comparisons. Regular critical listening, without the rapid switchovers, would not be able to pinpoint such differences.

The 16-46PC is clearly a killer subwoofer, and in terms of maximum-output abilities and extension uniformity, it is capable of holding its own down to 30 Hz or a bit below that frequency with units such as the Velodyne F1800RII, Hsu TN1220HO, and Paradigm Servo 15, each of which is electrically equalized for flat response down to the lowest audible frequencies.

Each of those subwoofers (even the nominally budget-grade Hsu, if you add in Hsu's big amplifier) are more expensive than the SVS unit, and to be truthful I know of no subwoofer in its \$800-\$900 price range that can stand up against it in terms of overall low-bass performance. For the record, a single 16-46CS, with the outboard, SVS-supplied amp, lists for \$925 (factory direct, just like the powered version), which still is a bargain.

As far as I can tell, either 16-46 model should be able to do justice to both home-theater and musical program sources in all but the largest home-listening environments. For those with really big rooms, the company suggests using two of the 16-46PC units (if ordered simultaneously, the total cost for two PC units is under \$1600), or using two of the unpowered 16-46CS models and driving them with the outboard 350-watt amp the company offers. The dual, 16-46CS, plus-amp, cost would be about \$1400, because you would only be paying for one amp to drive both units.

Regarding uniformity of frequency response right down to the lowest audible frequencies, as well as maximum-output abilities, a pair of those 16-46 systems (either powered or unpowered) would probably be able to match anything in the \$1600 or \$1400 price categories, or considerably more. This is because their outputs would add coherently (with a maximum of up to +6 dB) below the point where they normally begin to slowly roll off. This would naturally augment their outputs for subjectively flat response to below 20 Hz, with up to 6 dB of additional maximum headroom also being available.

Because of this, I believe that a pair of the 16-46 systems would easily hold their own in a subjective-performance face off against any of the units mentioned previously. Alone or in pairs the SVS 16-46PC subwoofer (or 16-46CS outboard-powered version) offers up world-class subwoofer performance, and does so at an unbeatable price. *-HF*