When they delivered the Energy ESW-M8 for review I thought the courier had mixed up the boxes, because the one he’d delivered to reception turned out to be smaller than the box my motorcycle helmet came in. However, the writing on the side seemed to indicate he hadn’t, as it proudly proclaimed that not only did it contain a high-powered subwoofer but, even better, it also had a ‘ribbed elliptical surround for my musical enjoyment’. This particularly innovative and titillating slogan had me wondering about the street smarts of some of the creatives working in advertising agencies. My conclusion? The ones who get to go on the crop!

**THE EQUIPMENT**

But if I thought the ESW-M8 was small, I was in for a bigger surprise when I hopped onto the Internet to see if there was any more information available than was provided in the sparse and skimpy owners’ manual. The surprise was that the ESW-M8 is not even the smallest subwoofer in Energy’s line-up: That honour goes to the Energy ESW-M7. Whereas the ESW-M8 is a cube that’s nine inches (229mm) on each side, the ESW-M7 is a cube that’s only eight inches (204mm) on each side. In the case of the ESW-M8, the height component isn’t exactly accurate, because although the cabinet itself is 229×229×229mm, the quoted measurement doesn’t take into account the four small rubber feet, which means that the ESW-M8 actually stands 238mm high, nor does it take into account the various protuberances on the rear of the subwoofer, which increase the effective depth of the subwoofer to around 260mm.

That said, these differences aren’t really too important, because the ESW-M8 is so small that you’ll have no problems positioning it in your room, even if that room’s the size of a broom closet. And if you’re using it in a bedroom, there’s every likelihood it will fit underneath the bed!

At first glance the ESW-M8 appears to have three bass drivers, but in fact only one of these three (the one facing the front) is a true ‘driver’ complete with a voice-coil and magnet. The other two are what are called ‘passive radiators’—or ‘auxiliary bass radiators’ (ABRs) or, sometimes, ‘drone cones’—that merely respond to the changes in air pressure inside the ESW-M8 cabinet that are caused by the front-firing driver moving inwards and outwards. The use of a passive radiator is just a variation on the well-known bass-reflex cabinet alignment, the advantage being that because there’s no port, there is no possibility of any extraneous noises due to the port ‘chuffing’. Another advantage of an ABR over a port is that if you use a port it can be quite easy to overdrive the main woofer, because the cone can move very freely, due to there being no air ‘trapped’ inside the cabinet to act as a spring. Passive radiators, on the other hand, allow the driven cone to move relatively freely at low volume levels, but ‘tighten up’ at higher levels, protecting the driver and at the same time reducing distortion. (The other common arrangement is for the driver to operate from a completely sealed enclosure—often called an ‘acoustic suspension’ enclosure—which provides a very stiff air spring and delivers low distortion, but requires a much larger cabinet and the use of a driver with a very high power-handling capacity. Such a design also needs to be driven by a very powerful amplifier.)

The bass driver in the ESW-M8 is rated as an ‘8 inch’ (20cm) driver (ergo the model name, one would assume), but the overall diameter is 223mm. The important Thiele/Small dimension is 152mm to give an effective cone area (Sd) of 181cm². The cone is dish-shaped with a continuous profile, so that the ‘centre’ of the dish is also the dust-cap, which gives a very clean line. The cone is manufactured from black anodised aluminium and appears to be very thick indeed, not a thin shell. At its periphery is a rubber roll surround with an ‘inverted’ profile. The profile is also not the usual ‘half-circle’ shape, but is instead part-elliptical, which Energy says allows more-linear excursion than a half-circle surround. The roll surround also has 16 ‘ribs’ cut into it, which Energy says delivers a reduction in distortion.

The two passive radiators (Energy calls this a ‘Dual Passive’ arrangement) are located on either side of the ESW-M8 and are built in an identical fashion to the main front-firing driver except, as I noted before, they have neither voice-coils nor magnets.

All the controls for the ESW-M8 are around the rear, on a black steel plate. The lack of any external heat-sinking on this plate had me guessing that Energy is using a Class-D amplifier inside the subwoofer, a guess that was given further backing by Energy’s claim for a power output of ‘300-watts’ which means that if the amplifier was a conventional Class A/B design, an external heatsink would be essential. The final giveaway, of course, is the size of the enclosure: It’s so small you couldn’t fit a 300-watt Class A/B amplifier inside! The volume, phase and low-
pass filter controls are all rotary in action, with the phase control being continuously variable (0°–360°) and the low-pass filter calibrated from 50Hz to 200Hz. If you rotate the low-pass filter control a little past the 200Hz calibration, the filter is then switched completely out of circuit, to give a pure BYPASS mode. Unlike some subwoofers, whose BYPASS mode actually leaves the filter in circuit, the Energy design is a complete bypass.

Given the space limitations on this subwoofer caused simply by its tiny size, I wasn’t surprised to find that only line-level inputs are provided, with the left-channel input doubling as an LFE input. The terminals are gold-plated RCA types. Below these terminals is a ‘WA Port’ which the manual advises, rather mysteriously, is ‘For Future Use.’ I suspect it’s rather more likely that Energy plans to use the same back-plate on other subwoofers, and so while they’ll activate the ‘WA Port’ on those models, they won’t be coming around to retrofit your ESW-M8! The connector itself looked a whole lot like an old-fashioned wired keyboard connector. Below the WA Port is the main power switch (a secondary switch selects between ‘always on’ and ‘signal sensing’) and a two-pin polarised 240V mains socket.

The Energy ESW-M8 is finished in a high-gloss piano black lacquer. It weighs 7.6kg and is rated with a frequency response of 36Hz to 200Hz.

I’d wholeheartedly recommend Energy’s ESW-M8, because the sound it delivers for its size and its price is truly amazing.

LISTENING SESSIONS

In my opinion, the role of a subwoofer is to efficiently reproduce, at relatively high volume levels, frequencies in the octave 20–40Hz, because this is the part of the audio spectrum that I consider to be ‘deep bass.’ Indeed it’s so deep that there are very, very few musical instruments that can actually play notes in this octave. Even the double-bass, one of the largest of the string instruments, can’t play down in this octave: the lowest note it can play is 41Hz. (At least it is on a standard, four-string double-bass tuned to concert pitch. A five-string bass’s lowest note is 30Hz.) The only other truly low-pitched instruments in common use are the piano, the pipe organ and the electronic synthesizer. (And to stave (!) off the inevitable emails from ‘Outraged of East Sydney’ concerning my complete lack of knowledge of musical instruments, I state in advance that I do not accept that the Eb contrabass sarrusophone, the tubax, nor even the admittedly fabulous Eb contrabass ophicleide are musical instruments that are ‘in common use’… and as for Gregg Bailey’s infamous subcontrabass clarinet, which is 64 feet long, it’s no wonder he doesn’t get to play at too many gigs, even though it is reportedly capable of playing as low as 4Hz!) I’ve gone into some detail about this because when I used the Energy ESW-M8 to play a variety of CDs that I know have considerable musical energy below 40Hz—Famous Blue Raincoat (35Hz), Dark Side of the Moon (27Hz) and Telarc’s Great Fantasy Adventure Album (10Hz)—it didn’t seem to translate this energy efficiently into my listening room. There was certainly some deep bass output, but not quite enough to satisfy my yearnings for deep bass. However, what these auditions proved to me was the Energy’s ESW-M8 is very efficient at delivering musical energy is in the two adjacent (higher) octaves: that is, the octave between 40Hz and 80Hz, and then the octave between 80Hz and 160Hz. Because of this, I’d be more inclined to regard the ESW-M8 as a superwoofer than a subwoofer. In this application, you’d use it to add additional bass to conventional loudspeakers that don’t have any—or at least, very little—deep bass of their own… which, I’d say, is any loudspeaker at all that has a front baffle about the same size or smaller than a standard paperback book. However, I have found that quite a few respectable-sounding bookshelf and stand-mount loudspeakers can also be found wanting at frequencies lower than 110Hz, and would certainly benefit from the additional low bass energy provided by the Energy ESW-M8.

The foregoing notwithstanding, it’s obviously possible to use the ESW-M8 in the role of a subwoofer, by connecting it to the LFE output of your AV receiver, and it will deliver low bass frequencies at lower sound pressure levels, so in a small room, if you play your music and/or movies at lowish volume levels, it could fit the bill nicely. And it’s not possible to increase the level of low bass simply by turning up the volume on the ESW-M8, because there are physical limits to what that single small bass driver can do even when so ably assisted by the two ABRs, as it is. Also, the more you dial up the volume, the more difficult you will find it to quickly and accurately discern the intervals between similarly-pitched low-frequency notes… though of course this isn’t at all important when reproducing movie sound effects!

CONCLUSION

Energy’s ESW-M8 is an amazing little speaker, not least because only a few years ago the world’s most experienced loudspeaker designers would have categorically stated that it was impossible to extract even this level of bass performance from a cabinet this size… at any price. But the bottom line really does come down to the physical size of the bass driver and the cabinet. You will get deeper, louder bass and a more linear low-frequency response from any of the larger subwoofers in Energy’s range, so if cabinet size is not absolutely critical, I’d recommend passing by the ESW-M8 and getting something bigger—preferably much bigger. However if for whatever reason it is essential you buy a subwoofer that is as tiny as possible, then I’d wholeheartedly recommend Energy’s ESW-M8, because the sound it delivers for its size and its price is truly amazing.

Greg Borrowman
TEST RESULTS

The frequency response of the Energy ESW-M8’s bass driver is shown in Figure 1 for three different settings of the crossover control. The topmost (black) trace shows the response when the control is set to a bit above 200Hz, which is the default ‘bypass’ setting.

This puts the frequency response at 40–400Hz ±3dB, which at the upper end of the spec is far better than Energy’s own specification.

The green trace shows the response with the control set to 150Hz and the red trace with it set to 50Hz. Note that all three traces are near-field plots on the front-firing driver only, so they don’t take into account the contributions from the two side-mounted auxiliary bass radiators, which would of course extend the response, as we will find soon.

You can see that in the bypass mode, the ESW-M8’s driver produces maximum output between 100Hz and 200Hz, where it’s also very flat (to within a dB or two). The driver’s low-frequency response starts rolling off at 100Hz, to be 7.5dB down at 50Hz, before diving to the system’s resonant frequency at 40Hz. The high-frequency response rolls off quite steeply above 200Hz to be 15dB down at 400Hz. You can see that if you turn the crossover control to its minimum point, the driver’s response is very flat between 50Hz and 90Hz, after which it rolls off to be 10dB down at 200Hz.

Figure 2 is another graph that results from near-field measurements, though this time it shows the bypass setting and the individual outputs of both auxiliary bass radiators. You can see that the output of the ABRs peaks at 37Hz, a little below system tuning, at 40Hz. The ABRs’ output is fairly concentrated around the peak output frequency, so that the response is 10dB down at 30Hz and 70Hz. However, both ABRs still produce output right up to 200Hz and beyond… exactly as you’d expect, given the design.

Figure 3 shows the frequency response of the ESW-M8, this time measured in the far-field (a distance of 2 metres) and using pink noise as a test stimulus, thus allowing the output of the dual ABRs to integrate with that from the front-firing bass driver.

The response with the crossover control set to 200Hz is exceptionally flat between 50Hz and 250Hz, varying no more than a total of 2dB. Peak output is at 110Hz, with the response rolling off to be –6dB at 40Hz and 400Hz. Normalised, this puts the frequency response at 40–400Hz ±3dB, which at the upper end of the spec is far better than Energy’s own specification, which it lists as topping out at 200Hz. As you’d expect, the ESW-M8’s output isn’t nearly so linear with the crossover set to 50Hz. In this case, the Energy’s output peaks at 60Hz and is –6dB at 35Hz and 120Hz or, normalised, 35–120Hz ±3dB. Again, Energy specifies the –3dB point at 36Hz, so the agreement with Newport Test Labs’ measurements is very close.

Harmonic distortion levels are shown in Figure 4, and the ESW-M8 performed very well indeed. Second and third harmonic distortion levels hovered between 1 and 5 per cent below 50Hz, but all higher-order harmonics fell below 1 per cent. All harmonic distortions save for the second and third fell below 0.1 per cent above 50Hz, and rose only at the upper end of the ESW-M8’s operating range. Between 90Hz and 500Hz, HDL3 hovered around 0.2 per cent, while HDL2 dropped from 0.2 per cent to 0.01 per cent before rising back to close to 0.2 per cent at 500Hz. This is excellent performance, but it was measured at only a low level: 100dBSP at the cone.

Steve Holding