



RICHTER HARLEQUIN S6

LOUDSPEAKERS

Richter Acoustics can lay claim to being one of Australia's oldest loudspeaker manufacturers and the Harlequin S6 is one of its longest-running designs. It takes its name from the famous mischievous 'devil' or 'demon' character in French passion plays that were popular in the 16th century, and it's a name that is very appropriate considering that top-of-the-range model in Richter's speaker line-up is called the Wizard.

THE EQUIPMENT

As you can see from the photographs of it accompanying this review, the Harlequin S6

is an unusual design, a two-way, two-driver floor-standing loudspeaker. Unusual because most two-way designs are in small cabinets that are intended to be placed on stands or on shelving or a side-table (and indeed Richter has just such a model in its range, called the 'Merlin' after Great Britain's most famous 'wizard').

Floor-standing two-way speakers have many advantages over their smaller counterparts. Foremost amongst these is that the larger cabinet enables a more extended bass response than would otherwise be possible, because any given bass driver will always deliver more bass in a large enclosure than the same driver in a smaller enclosure.

An important but less immediately obvi-

ous advantage of a floor-standing two-way design is that it means there's no need to buy a pair of stands, as there obviously is with a stand-mount design. And lest you underestimate the importance of this, I suggest you investigate the current retail price of a decent pair of loudspeaker stands!

There's also the look. It may just be me, but I think a pair of floor-standing loudspeakers looks better in a typical lounge-room than a pair of small speakers on stands.

The 165mm bass/midrange driver in the Harlequin S6 (the S6 is short-hand for Series 6, this being the sixth series of these particular Richter design) is new for this model but has already been used in the Wizard. It's a brand-new driver not only for the Harlequin design, but also for Richter, and it's one that was designed by Richter's very own Dr Martin Gosnell.

Although the driver is 165mm in diameter, the Thiele/Small diameter is 128mm, which gives an effective cone area (Sd) of 129cm² which is slightly greater than that of the previous model Harlequin (S5). Although the cone looks like it's made from polypropylene, looks can be deceiving, because it's actually made from a mixture of paper, hemp, kapok and wool. The blackness and gloss of the cone's surface is due to a sealant coating to ensure the cone is not hygroscopic, in order that its performance will be uniform irrespective of humidity.

I must say that Richter has really tidied up the look of this driver, which is not only recessed into the front baffle, but also has the periphery of its chassis neatly covered by a black rubber dress ring, so it's not possible to see the bolts that secure it to that baffle.

The tweeter is also a brand-new design for Richter, and uses a high-power neodymium magnet to drive a 25mm soft fabric dome. Says award-winning designer Dr Martin Gosnell: "It has lower distortion than the tweeter we previously used in the Harlequin, and also has a lower resonant frequency that gives us the desired phase characteristics and a frequency response that extends to beyond 30kHz." I should note that because it is expensive for small loudspeaker manufacturers to design their own drivers, and have them built, Richter uses this self-same tweeter in its Wizard and Merlin models. The advantage is that it can order the tweeter in larger numbers, to constrain materials costs.

The new drivers meant the Harlequin's crossover network was also re-designed, during which process Richter took the opportunity to upgrade the various components on the PCB, so this 'S6' version has high-quality acoustic polypropylene bipolar capacitors, high-power cermet wire-wound resistors and

both air cored and ferrite cored inductors with the former and latter cross-mounted to eliminate unwanted magnetic interactions.

The Harlequin is a bass-reflex design, with the port at the rear of the cabinet for which Richter provides foam plugs that can be optionally used “for even greater control of

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room and equipment variables” (as the company says in its brochure). Although many manufacturers now supply ‘bungs’ that can be used to ‘tune’ the bass response, the ones provided with the Harlequins work better than most when they are inserted because of the greater volume of air inside the cabinets.

Just below the bass reflex port is a single pair of very high-quality gold-plated speaker terminals that is both colour coded and clearly marked with ‘+’ and ‘-’ identifiers. These, too, are new for Richter, and they easily accommodate bare wire, pin connectors, spade connectors, ring connectors and banana plugs... the full gamut.

Also new for the Harlequin is the cabinet itself. Although the raw measurements don't really reflect it, the cabinet's walls are now not parallel, sloping inwards from being 221mm wide at the front to 210mm wide at the rear. This is presumably to ameliorate the creation of standing waves, but it also makes the cabinets appear less ‘boxy’ than the standard rectangular prismatic shape that's used to build loudspeaker cabinets.

To complement the new and shapely cabinet is a new ‘Matte Black’ cabinet finish that's textured on all sides except the baffle, which has a smoother, ‘slicker’ black finish. There's also a new wood-grained finish that Richter's proud Aussie owner, Brian Rodgers, calls ‘New Walnut’.

Irrespective of which finish works best for your decor, your speakers will come with a black speaker grille that attaches magnetically, so if you choose not to use it, you won't see any unsightly grille fixings. Richter also puts its silver/black embossed logos on both grille and baffle, to ensure brand recognition.

The modern trend to make floor-standing speakers tall and narrow, has implications for their stability, which can be a serious issue in households with pets, small children, or both!

Richter has addressed this on the Harlequin S6 by providing a pair of almost boomerang-shaped ‘speaker stabilisers’ that it says brings their stability up to furniture-industry safety standards.

These stabilisers come included as standard with the Harlequin S6 speakers but they're also available separately (for \$249) because their clever design is such that they can be fitted to a wide range of floor-standing speakers made by manufacturers other than Richter. So if you already own a pair of floor-standing speakers whose stability you're unhappy with,

I'd encourage you to see if the Richter outrigger feet will fit them. The stabilisers come with spikes, spike protectors and rubber feet, so they can be used on any type of flooring.

As for how tall and narrow the Harlequin S6 speakers might be, I measured them as being 930mm high, 300mm wide and 310mm deep, and they tipped my (admittedly bathroom!) scales at a tad more than 15kg.

LISTENING SESSIONS

Yes it's a floor-stander, and yes they deliver more bass than a stand-mount loudspeaker with an equivalently-sized bass/mid-range driver, but don't expect the bass extension and sheer ‘thwack’ from the Harlequin S6s that you'd get from, say, a pair of Richter Wizards.

That said, you're going to be very pleased with the bass you will hear when you audition the Harlequins because it's tight, rhythmic, and has the type of slam and pace you'd only expect to find in a much larger and more expensive pair of speakers, plus its bass goes deeper than you're likely to need unless you're using them for the front channels of a home theatre system and need to hear movie sound effects. (In which case I'd suggest Richter's Thor 6 subwoofer would be an ideal choice.)

I fired up one of my favourite bass testers, which happens to be one of my favourite disco/funk tracks as well. The track to which I refer is *Act Like You Know*, by Fat Larry's

Band, on the album ‘Break-Out’. (Larry really was fat too... which no doubt contributed to his death aged only 38, reportedly of a heart attack.) This track is notable not only for Larry's drumming, which really sizzles on this track in particular, but for the fabulously fluid, inventive—and complex!—bass lines by Larry La Bes. If you're a gamer, you'll have heard this track, because it's part of the soundtrack CD to the 2002 video game *Grand Theft Auto: Vice City*. Later on when the boogie synth line kicks in and then the horns, you'll get to hear the Harlequin S6s' great midrange delivery. But while you're waiting, listen to the depth of the skin sound on Larry's kick drum and the ‘string’ sound of La Bes' bass, as well as the way you can hear the attack on the bass strings distinct from the fundamental. Impressive stuff.

To listen to the midrange, I'd recommend Sarah McLaughlin's sad but beautiful song *Angel*, which she wrote following the death of the Smashing Pumpkins' keyboard player, Jonathan Melvoin. The Harlequin S6s reveal McLaughlin's fragile voice to perfection, especially when she shifts register.



You'll also hear the sympathetic way the Richter Harlequin S6s handle the rather poorly-recorded piano sound.

Can the Harlequin S6s rock? You bet they can! I fired up *Sympathy for the Devil* and cranked the volume as high as I dared.

I love the sonic complexities of this song, the samba rhythm, the lyric, the slow burn that climaxes with arguably the most significant lead break Keef's ever played. The scream of his guitar leapt out from the Harlequins like a banshee, so clean yet so raw I was surprised even though I knew exactly when to expect it. The Richters delivered the totality of the sound-field and all the instruments with accuracy and precision throughout the entire track. I personally found the Harlequin S6s' highest frequencies a little forward in the mix but also found that by leaving the grilles on and turning the speakers so that my listening position was a little off-axis, I easily reduced the highs and achieved my preferred sonic balance. I think being able to tune the high-frequency delivery this way is a definite advantage. (If a speaker has too little treble, there's no way to fix it!) Whatever midrange/treble balance you prefer to arrange for yourself, you will hear that these Richters deliver beautifully crystalline treble that transmits the air around the highest notes totally transparently.

CONCLUSION

Richter's Harlequin S6s are outstandingly good speakers. I liked everything about them: their sound quality, their appearance, their power handling ability, and their efficiency. I most particularly liked their price which, given their high level of performance, came as a particularly nice surprise. These are speakers you should most definitely audition! 

Nick Townshend.

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- Great sound
- Very efficient
- Top value



- Not bi-wirable
- Finish choices

Readers interested in a full technical appraisal of the performance of the Richter Harlequin S6 Loudspeakers should continue on and read the LABORATORY REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

LABORATORY TEST REPORT

Newport Test Labs measured the in-room averaged frequency response of the Richter Harlequin S6 speakers using pink noise as this is the test method that most closely simulates the response that would be perceived by the human ear. The result, shown in Graph 1, is obviously excellent, with very good low- and high-frequency extension.

The low-frequency response is 3dB down at 38Hz, which means that it's probably exactly what Richter would have measured, except that Richter's specification of 31Hz is the speaker's -6dB downpoint. The room in which the speakers are used, and the speakers' proximity to boundaries (walls, etc) will have a significant effect on the low-frequency extension, and in all cases will give greater extension than the one measured (and graphed) by Newport Test Labs. However, to put things into a musical perspective, 31Hz (D₁) is just three semitones below 38Hz (B₀) on the tempered scale, so it's a tiny difference in extension.

Although frequency extension is important, it's also important that a loudspeaker exhibits linearity across the midrange, in particular, as well as a neutral spectral skew. As you can see from Graph 1, the Richter Harlequin S6 excels in both areas with the midrange linearity from about 100Hz up to 1.5kHz being within ±1.5dB and there's a completely neutral spectral skew.

As you can see on the graph the S6's frequency response is not completely flat, with a mild (-2.5dB) but broad dip that starts a bit above 1kHz and runs up to 8kHz. Above this frequency the response continues to rise before peaking at around +2.6dB at 20kHz, which is the effective measurement limit for this particular test.

The Richter Harlequin S6's high-frequency response is shown in greater detail in Graph 2, but this time, rather than an

in-room pink noise response, as in Graph 1, it's a gated sine measurement, which gives the response the speaker would return if it were measured in an anechoic chamber and enables the accurate measurement of frequencies above 20kHz. This graph also shows the response measured with the grille off (black trace) and with the grille in place (red trace).

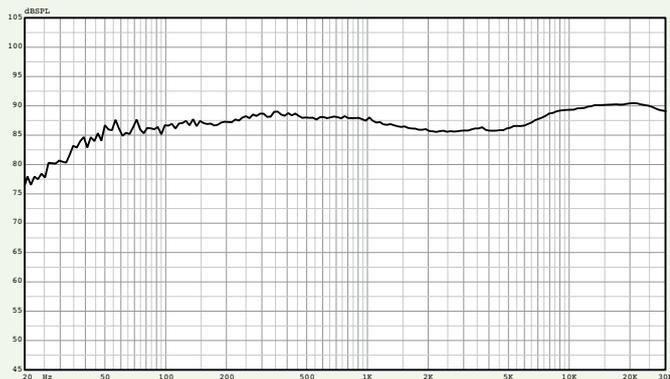
You can see that the increased resolution enabled by the gated sine measurement technique shows a high-frequency roll-off above 30kHz. The increased resolution also shows that the broad dip shown in Graph 1 is rather more complex, with a shelf from around 2kHz up to 3kHz, followed by a peak, then a suck-out from 4.5kHz to 7kHz, after which there's a steep rise to 21kHz. It should be noted, however, that some of these peaks and troughs are measurement errors, due to the different path lengths to the measurement microphone from the two drivers, as both are producing the same frequencies in this region of the audio spectrum.

Graph 2 also shows that the Harlequin S6's frequency response is marginally smoother without the grille than with, but there's so little difference that it will be a matter of whether you prefer the look of the speakers with the grilles on or off—though of course using the grilles affords a level of physical protection for both drivers, so it would be safer to use them than not.

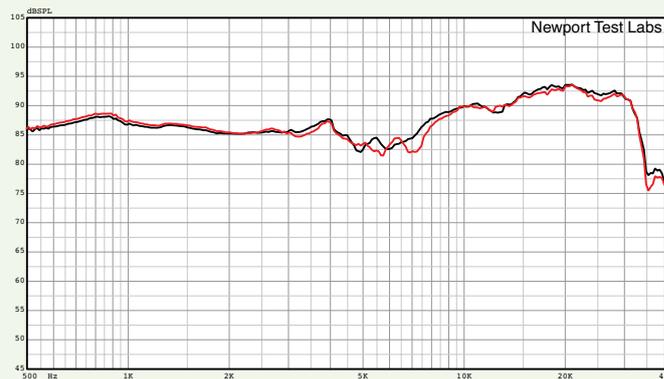
The low-frequency response of the Harlequin S6 design is shown in Graph 3. The black trace shows the nearfield response of the bass/midrange driver when the rear-firing bass reflex port is left open, while the green trace shows the response when the port is blocked using the bung.

As you can see, the response is identical above 60Hz, but below 60Hz the output of the driver rolls off steeply when the port is open, but shallowly when it's blocked, exactly according to theory for the two different cabinet alignments. The red trace on the graph shows the cabinet is tuned for 37Hz, so this is the frequency at which the port delivers maximum output.

The Harlequin S6 is more efficient than I would normally expect for a two-way design



Graph 1: Averaged in-room frequency response using pink noise test stimulus with capture Trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter.



Graph 2: High-frequency response, expanded view, with grille (red trace) and without grille (black trace). Test stimulus gated sine. Microphone placed at one metre on-axis with dome tweeter. Lower measurement limit 500Hz.



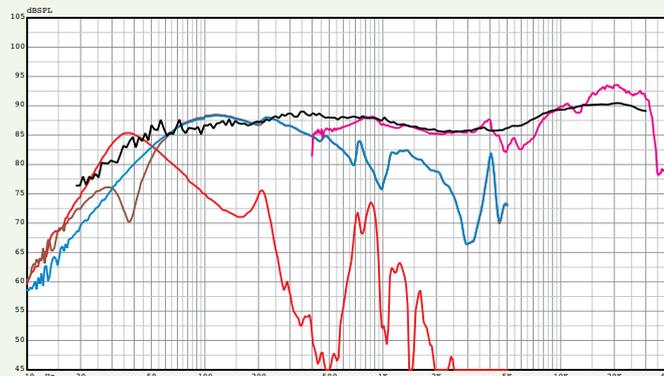
Graph 3: Low frequency response of front-firing bass reflex port (red trace) and woofer with open bass reflex port (black) and with port blocked (green trace). Nearfield acquisition. Port/woofer levels not compensated for differences in radiating areas.



Graph 4: Impedance modulus with reflex port open (black trace) and blocked (red trace) plus phase (blue trace).



Graph 5: Frequency response. Trace below 800Hz is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter using pink noise test stimulus with capture unsmoothed. This has been manually spliced (at 800Hz) to the gated high-frequency response from Graph 2.



Graph 6: Composite response plot. Red trace is output of bass reflex port. Dark blue trace is anechoic response of bass driver. Pink trace is gated (simulated anechoic) response above 600Hz. Black trace is averaged in-room pink noise response (from Graph 1).

Although Richter rates the nominal impedance of the Harlequin S6 as 6Ω, Graph 4 shows that it's been given this rating primarily because the minimum specified impedance is 4.6Ω, and this is exactly what Newport Test Labs measured. Richter should probably also have specified the frequency at which it reaches the 4.6Ω minimum (it's at 160Hz) but full marks for specifying a minimum at all (since so few manufacturers do and they all should), and extra bonus points for being realistic about the nominal impedance. (You can see that the impedance actually falls below 4.5Ω below 12Hz, but impedance is usually

measured—and stated—only across a 20Hz to 20kHz bandwidth.

In addition to showing the impedance of a speaker, Graph 4 also shows cabinet and other resonances and you can see very small ones at 200Hz, 280Hz, 700Hz and 14kHz. Although the impedance falls above the crossover frequency (at around 3kHz), it's still a little above 5Ω at 20kHz and rises above 25kHz, which means amplifiers will be happy to drive them, not matter what Class the output stage might be—from Class-A right through to Class-G, but most importantly with Class-D amplifiers. Amplifiers will also be happy driving the

Harlequin S6 speakers, because the phase angles are controlled and at phase angles of ±45 degrees their impedance is always 6Ω or higher.

The Harlequin S6's fairly large cabinet volume means that it's more efficient than I would normally expect for a two-way design, with Newport Test Labs reporting a sensitivity of 87dB SPL at 1 metre for 2.83Veq input. Although this is an excellent result, it is a little lower than Richter's claim for 88.5dB SPL.

As for the overall frequency response of the Richter Harlequin S6, Newport Test Labs put it at 38Hz to 33kHz ±3dB. **— Steve Holding**