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Larva. Pupa. Lowther.

I was going through a box of old photographs, lingering over some pictures I'd taken at the Quad loudspeaker factory in Huntingdon, England, a number of years ago. It was my second trip overseas—1994 or '95—and while I remember being intrigued by the machinery and the test equipment and all, I know that the real impact of the tour was probably lost on me: I wasn't yet a Quad *owner*.

That's all changed, of course. In 2000, I bought *Stereophile*'s review pair of the excellent Quad ESL-989, and used them regularly for the next six years. Then, a number of months ago, I bought a pair of vintage Quad ESLs (*ca* 1959) and spent several weeks bringing them back to life and up to spec (see my columns in the June and July 2006 issues).

Now I'm a Quad owner, and *now* I wish I could go back and see: How did they stretch those Mylar diaphragms? What kind of coating did they use on them? Precisely how did they test those ESL-63 panels? What were the people like who took in all the old Quad gear for repair?

The thing is, Quad electrostatics are now more to me than just appliances: They've helped to shape my point of view. They *matter*.

I've seen other brands have the same effect on other hobbyists—I can understand why some people have come to care about McIntosh, or Klipsch, or Thorens. Now Quad has affected me in much the same way.

Lowther's ticonal drivers

In 2007, the people who actually *make* Quad electrostatics are all in China, and I have no enthusiasm for very long airplane rides. But I can transpose a part of my enthusiasm to another venerable English brand that has shaped my point of view on domestic playback gear—and that, of course, is Lowther Loudspeaker Systems Ltd. As it happens, the Lowther factory, in Sidcup, Kent, is one of the few audio-equipment factories where I know I wouldn't be welcome.

Neither would Mikey or Wes or Sam. Neither would you: The Lowther factory is off-limits to the press and the general public because the venerable company has diversified over the years, and Lowther now does a lot of contract work for the British military. These days, in fact, the making of Lowther loudspeakers seems to be the *least* important thing done at Lowther Loudspeaker Systems, in terms of profits and people-hours.

But even if they made only a dozen drivers per year, I'd still think it was the most important task in Kent, if not in all of England: Those distinctive and utterly fascinating drive-units, which have changed so little in the past 60 years, are the embodiment of certain combined qualities of which nothing else can boast.

I've written about Lowthers once or twice in this space—like a hibernating insect, I seem to obey a kind of a seasonal cycle when it comes to subjects such as this one, or that of the Linn LP12 and its various different power supplies—but the company's sheer endurance, and the unique relevance of their products to the modern single-ended-triode movement, are sufficient justification for that.

IMAGES: ART DUDLEY

Lowther PM2A ticonal.

First and foremost, by combining low-mass paper cones with enormously powerful magnets and deliberately narrow voice-coil gaps, Lowther makes drive-units that are a great deal more sensitive than average. The Lowther PM2A, which is something of a standard-bearer among their 7" drivers, has a voltage sensitivity of 97dB in free air. Combined with a sensibly high impedance curve, that makes for a driver that's very efficient overall—a characteristic that will only increase under proper loading conditions (which I'll return to in a moment).

Second, for some of those same reasons, Lowthers are extremely *fast*, rivaling the best electrostatic panels in this regard.

Third, Lowthers are true full-range drivers. In a typical domestic installation, the aforementioned PM2A can reproduce a minimum of eight octaves—more, given a *very* good enclosure. Additionally, Lowthers perform that trick without electrical crossovers of any sort: A single voice-coil drives both a 7" parchment-like cone and a 3.5" treble "whizzer." And a clever spider design allows for the use of a specially shaped phase plug that prevents short-wavelength tones from being canceled out at the whizzer's apex.

Fourth, Lowthers are cool, in the same sense that Morgan automobiles, bamboo fly rods, and spirit-based woodworking finishes are cool. They appeal to the hobbyist who enjoys the challenge of working within certain technological limits, and who craves a higher-than-average degree of involvement with his or her hardware. In this instance, that's because the perfect Lowther enclosure has yet to be achieved, despite some tantalizing near-successes.

That Lowthers bring out the best in one small group also implies that they aren't for everyone: also very true. For one thing, the most successful Lowther enclosures have all been backwave horns or tapered, quarter-wave pipes—all of which tend to be large, conspicuous, domestically unacceptable things. For another, the drivers themselves have certain shortcomings, the likes of which make them unsuitable for less committed hobbyists. The narrow voice-coil gap is vulnerable to dust and other contaminants, and for that reason—and because the pull of the very heavy magnet can distort the driver's frame over time—the drivers may need occasional cleaning and realignment. That isn't *too* hard to do, but it requires a steady hand and lots of patience. (As in setting the breaker points on an old-fashioned distributor, a setting very painstakingly arrived at can be utterly ruined merely by tightening the locking bolts at the end of the procedure—and so you must start all over again.)

Lowthers are also notorious for having a bump in their lower-treble response, reportedly caused by a resonance that's set up in the crease between the two paper cones. With earlier Lowther drivers, I've been trou-

bled by the "Lowther shout" myself—but much less so with all of the current-production units I've tried. That's because the Lowther whizzer of today is formed with an integral lip at its outermost edge, folded back about 3/16", as opposed to having the raw edge of the paper cone facing outward. The lip may not prevent the resonant tone from being produced, but it does seem to block it from reaching the listener's ears—which is good enough for me. Progress isn't always such a bad thing, you know.

My current favorite Lowthers are an old pair of PM2A drivers that not long ago were rebuilt, with new cones and fresh foam-rubber surrounds. Still, they differ interestingly from their newer cousins: For the most part, Lowther's A-series drivers use alnico magnets (C-series Lowthers have ceramic magnets, while the DX and EX series both use neodymium), but my PM2As have magnets made out of ticonal, a permanent-magnet alloy that uses the same elements as alnico—aluminum, nickel, copper, iron, and cobalt—but adds a dash of titanium for the sheer reckless fun of it. Ticonal magnets have the same outward appearance as their alnico cousins, but the Lowther cognoscenti have now begun to crochet a potholder of mystique around them, attributing the same sorts of sonic advantages to the obsolete magnet compound as some of us have recently done for…well, for alnico itself, to name just one.

And I'm not at all embarrassed to tell you: My PM2A ticonals really *do* sound special. Apart from the advantage conferred by the new style of whizzer cone (I've also made direct comparisons between old-style and new-style PM6A drivers), my rebuilt units sound warmer, a little less dry, and a little more organic than the regular PM2As they replaced. The ticonals are also freer from unnatural graininess, yet they're no less able to convey real, musical textures.

But there's something I haven't yet mentioned: My PM2A ticonals share another distinction from current production, in that their voice-coils have not been coated with Lowther's patented Hi-Ferric compound, a magnetically reactive paint that's said to enhance the driver's ability to electrically damp itself. Hi-Ferric is among Lowther's more recent developments, and, not surprisingly, some traditionalists have been slow to accept it. Apart from the tendency of certain hobbyists to mythologize the good, old way of doing things—which I admit to falling prey to myself, from time to time—one also wonders if the thickish magnetic coating took up just a little too much room in an already very narrow voice-coil gap.

In any event, the point is this: I know that my current PM2As sound better than the PM2As they replaced, but I have no way of knowing how much of that can be laid at the altar of ticonal, or how much has to do with the simple absence of Hi-Ferric. Humankind may never know.

If you're interested in having a pair of Lowthers made *without* Hi-Ferric, that's easily done: Just ask. (The Germans do it all the time, I'm told.) The Lowther factory will respond to any such request, as long as you don't insist on dropping by to watch them do it.

If you're interested in owning a pair of ticonals, your prospects are blurry but not bleak. The pair I bought had actually been *loaned* to me, by their importer, just so I could hear what the ticonal craze is all about. Then, during their stay here, some old-timer sent *his* Lowther ticonals to the factory as a trade against something else, thus making another pair available for rebuilding and reselling. The importer got the newer ones, and I bought and kept these. Just like that: la-di-da.

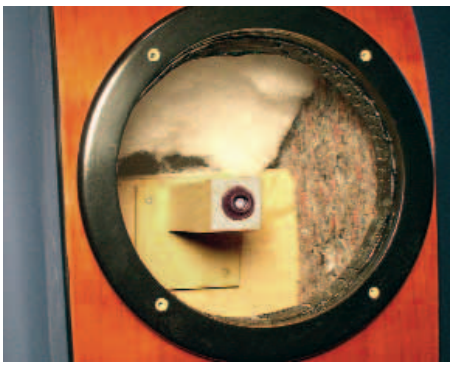
Teresonic Integrum loudspeaker

Not all Lowther fanatics are prissy Luddites, of course—which reminds me of a joke:

Q: *How many Lowther enthusiasts does it take to change a light bulb?*

A: *Three: one to change the bulb, and the other two to whine about how much better the old one was.*

That said, let me introduce the newest faces on the Lowther scene: the good people of Teresonic LLC, of San Jose, California. I mean *faces* literally. The first things that caught my attention when I visited their website (www.teresonic.com) were the unmistakably happy faces of people from all walks of life: young, old, male, female, Caucasian, Asian, you name it. It reminded me of the promotional materials of yet another direct-sale loudspeaker manufacturer, Aperion Audio, of Portland, Oregon (www.aperionaudio.com). The sites of both companies are *extremely* well done (*for perfectionist audio*, you can hear me thinking), with sensational graphics, lively prose, and the downright calisthenic smiles of people who could be your sister, your kindly uncle, your babysitter, your tattoo artist—anyone but you and me.



Come on: *Tell* me that dosen't look like an ESL leg!

Don't be put off: The sheer professionalism of the Teresonic website is carried over to their product line, as I discovered when CEO Mike Zivkovic sent me a review pair last summer. The company makes two Lowther-based loudspeakers, both using tapered quarter-wave pipes for loading, and the one I tried, the entry-level Integrum ($7950/pair), is among the most well-thought-out products I've had the pleasure of using. Everything about the Integrum—from its packaging to its documentation to its high levels of fit and finish—spoke of a company that intends to stay around for the long haul. If I were Lowther, I'd be flattered.

You may recall the basics of quarter-wave

cabinets from my March 2006 column on the Horning Perikles loudspeaker. (See? Seasonal cycle.) In a nutshell, this loading scheme uses a long rear-wave labyrinth to do three distinct jobs: to keep the driver's resonant frequency low (as contrasted with the effect you'd have by putting the driver in a small, sealed box); to damp the driver's impedance peak at its resonant frequency; and to bring the phase of the driver's rear-wave bass output more or less in line with that of its front wave, for an additive bass-reinforcement effect.

In a design of this sort, one other nice thing can happen. Because the rear-wave labyrinth is bent, some degree of acoustic inductance will be a part of the package, and the pipe will act as a low-pass filter. Which is to say, the mid and high frequencies *won't* be reinforced. Good. You don't want them to be.

The Integrum's quarter-wave pipe appears to be a little over 70" long. It's folded once, at the top of the cabinet, and the pipe fires toward the listener through a rectangular opening that measures 8.5" wide by 2" high. On the inside floor of the cabinet there's a wood cylinder, perhaps a half a foot tall and 5" in diameter, the only opening to which is a small port filled with acoustically resistive foam: a Helmholtz resonator, presumably tuned to reinforce a small range of frequencies at which the speaker's response is otherwise weak.

The inner portion of the cabinet is also fitted with a chunky wooden peg—taken together, the peg and its mounting base bear a strange resemblance to the center foot of a Quad ESL—which serves the dual purpose of bracing the inner wooden baffle and snugging up against the Lowther driver, preventing unwanted movement and consequent loss of information. Because the Integrum was designed around Lowther's DX series of neodymium-magnet drivers, and because those are the shallowest 7" Lowthers one can buy, there's little room for driver experimentation. In an effort to hear how Lowther's PM2A ticonals would perform in the Teresonic cabinets, I tried to remove the pegs by removing the four wood screws that seemed to hold each of them in place. Unfortunately, an adhesive of some sort is also used, and I decided not to carry on, for fear of causing permanent damage.

It would appear, then, that different Lowther drivers can be substituted, but only with effort; I can neither predict nor guarantee how any other pairing might sound. (The Teresonic Integrum is equipped with a Lowther DX3 driver as standard; Lowther DX4s are a $1980/pair option.)

The Teresonic Integrum contains two types of sonically absorbent fill material: polyester batting inside the tube, and thick, heavy matting—rather like the stuff underneath your carpets—attached to most of the interior surfaces. The speaker connectors are gold-plated WBT binding posts, and the wiring is Teresonic's own Clarison shielded speaker cable, the ribbed sheathing of which imparts to the cable a somewhat larval appearance. Rubber feet are bolted to threaded inserts on the bottom surface of the cabinet, which also accept threaded spikes (supplied).

Apart from its most obvious quality—the ability to be driven with just a couple of watts—the Integrum was every inch a Lowther in its tunefulness and lack of timing distortion. Lowthers are so good at those music-making essentials, and so free from pitch uncertainties and ponderous tempos, that they'd be perfectly well suited for even the flattest of audio's Flat-Earthers—if not for their lack of deep bass. (One can only imagine that Ben Sidran's *Don't Let Go* is even less appealing when auditioned from 100Hz up.) Make no mistake: Lowthers don't have a lot of bass. I've never heard a full-range Lowther application that was flat even to 50Hz, and the Teresonic Integrum is no exception, despite what anyone else may tell you. I bow to no man in my enthusiasm for Lowthers, but I've also never ceased to respect the line between enthusiasm and delusiasm.

But they're so dramatic—and *so* impactful! A softly played percussion instrument in the seventh section of Copland's *Appalachian Spring*, with Walter Susskind conducting the London Symphony Orchestra (SACD, Everest VSD 504), sounded so real that, the first two times I heard it, I thought it was a noise someone was making in the next room—a noise that just happened to be in time with the music. The sound of the Nibelungs' hammers in Solti's great recording of Wagner's *Das Rheingold* (LP, London OSA 1309) scared the bunny *and* the cat.

There was also something about the Integrums' stereo imaging that I really liked—a sort of spatial cleanness and clarity that made it easy to tell where the soundfield began and ended. Perhaps that was a function of the cabinet shape: The slim, curved baffle has fewer edges—indeed, less area overall—off which shorter wavelengths can reflect and possibly smear the spatial cues in well-made stereo recordings.

The Integrum is a superb product, especially for the SET-curious audiophile to whom music and sound are higher priorities than Lowtherism's hands-on, DIY aspect. Though fairly priced, the Integrum isn't cheap, and while I wouldn't mind giving up some aesthetic refinement in order to save a couple thousand dollars (how about a paint-it-yourself version done in simple white primer?), I know that there are homes in which the traditional Lowther cabinet's ungainliness is a deal-breaker. Teresonic could tip things in that man's favor.