New Level Technology

by Bill Brockway

Levels for construction have come a long way from the early days of the weighted string and the two bits of wood that were popular with the builders of the pyramids. Fourteenth-century craftsmen used fluids to find level references — either with a water level or a bubble in a slightly bowed glass tube filled with liquid and attached to a straight rail. More recently, levels were made of exotic hardwoods bound in brass with bubble vials set in putty in a recess in the rail. Dimensionally stable species like mahogany, ebony, and rosewood were popular, though today many levels are machined out of aluminum box beams. Here are a few companies that have taken level technology one step further — in many different directions.

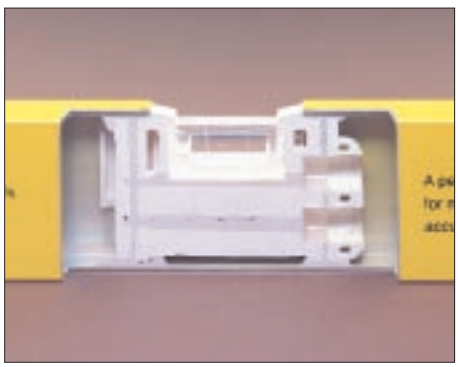

Figure 1. *This cut-away view of a Stabila box-beam aluminum level shows how the vial housing is epoxy-locked into the rail. This permanent system means that you can't recalibrate a level in the field, but it also means that you shouldn't have to.*

Stabila

Stabila was one of the first level companies to use acrylic vials. Precision micro-grinding hollows out a solid block of acrylic; the bore is slightly barrel shaped, so the level always reads true, even upside down. The whole block is then set into the rail. The manufacturer guarantees that the vials won't break, leak, or fog for the life of the level. It also guarantees that the bond between the vial and the rail won't break, and that the level will stay accurate to within 1/32 inch over six feet for the life of the level. Stabila gets this bond by setting the acrylic block in epoxy after it's been installed in the rail (see Figure 1). No, you can't adjust the vials later, but if the level goes out of whack, the company says it will give you a new one for free.

Stabila makes several sizes of levels — all the way from a 10-inch cast-aluminum torpedo level to an 8-foot-long aluminum box-beam level. Prices range from $30 to about $170. My favorite all-around toolbox level is the *Pro-89* — a 16-inch model with an angle-setting vial (accurate to one degree), shock-absorbing end caps, and magnets on one edge of the rail.

Stabila also makes one of the more accurate laser levels available (thanks to its precision vials) and a model with an electronic module that gives digital readouts of angles and slopes.

Another popular tool is the 4-foot model that comes either with or without hand holds cut into the rail. Hand holds are useful for general carpentry work, but masons, who frequently tap the level with the trowel to set a block, view the hand holds as weak spots and prefer to do without them. Stabila's Mason's Levels include ribbed reinforcements to strengthen the box beam. For more information, contact the Stabila Division of Hawera Inc. (743 Kimberly Dr., Carol Stream, IL 60188; 800/869-7460).

Levelution

If you're thinking you need to buy a dozen different levels to get through a day's work, consider an expandable level system like Levelution.

Finding one tool that does the work of many is always a big score for builders. The *Levelution* system provides several levels from one package. The pieces fit together in various combinations to form anywhere from a 1-foot to an 8-foot level (Figure 2).

The basic kit has two 2-foot and one 4-foot level that all fit into a padded carrying case. A 1-foot level and a T-square attachment are optional extras; there are mesh pockets on the case for storing them.

This tool isn't one of those gadgets that tries to do so much that it does nothing well. On the contrary, the Levelution rails connect together easily, creating a longer level that's as straight as the first. I assembled the level, drew lines, pulled strings, and had several people simply sight down the edge and everything confirmed that yes, this thing is straight. What impresses me the most, however, is that all three bubble vials, one in each of the sections, read exactly the same. This is a well-machined precision tool.

The secret to the perfect alignment of the pieces of this system is the design of the joint that holds them together. The screws on the socket end of the joint force the wedge-shaped tongue down an inclined plane and up against a flat wall, which lines both halves up in exactly the same plane. The joints are fastened to the rail ends with structural adhesive rated to withstand over

Figure 2. *A carpenter uses the Levelution in 8-foot mode. The triangular knobs mark the joints in this expandable rail. A 1-foot accessory (visible in the carpenter's pocket) can be swapped in at any joint to make levels of other lengths.*

Figure 3. *Macklanburg-Duncan's SmartTool combines traditional technology with modern electronics. Bubble vials are included for quick references, and the module can help you transfer angles and slopes from one work surface to another.*

ten tons of force, so unless you use the thing as a crowbar, it'll be accurate for as long as you own it.

The basic Levelution system — a 4-foot stick and two 2-foot sticks — costs just under $230, case included. A 1-foot level, which allows you to build 3-, 5-, and 7-foot levels, sells for about $40. The T-square attachment sells for around $20. You can also buy an extra 4-foot section to expand the system to 12 feet — the manufacturer claims it's still straight as an arrow. A protractor and an electronic module will be available later this year. For more information, contact Levelution LLC (P.O. Box 3351, Hailey, ID 83333; 208/788-4242).

SmartTool

The latest generation of the SmartLevel family — the *SmartTool* — has certainly come a long way from the first models produced by Wedge Innovations.

The new level, now made by Macklanburg-Duncan, combines a new SmartTool module with two traditional bubble vials in the rail (Figure 3). The SmartTool also features an optional audio signal that beeps at level or plumb, and the display will flip over so you can read it right side up even if the level is upside down. If you just need a quick reference for plumb or level, use the bubbles. The electronics will serve you better for reading and transferring angles and slopes.

My own experience with the first generation of the SmartLevels was that they needed frequent recalibration. Any bump on the rail knocked them out of whack. M-D seems to have eliminated this annoying problem. I didn't actually give it the "six feet onto concrete" drop test, but I did kick it around a little on site, and it continued to give consistent readings. I recalibrated anyway, just to try out the procedure: It took only 45 seconds.

Another M-D innovation is the portability of the module itself. If you own an M-D level (American 6000 Series level or a 6500 Magnetic Series), you can retrofit the module into one of the hand holds. The portable module (with a slight redesign to accommodate the battery) sells for about $95, and the 24-inch SmartTool with the module permanently attached in the rail sells for around $110.

For more information, contact Macklanburg-Duncan (4041 N. Santa Fe, Oklahoma City, OK 73118; 800/665-2737). ■