Site-Built Plumb Stick

by Sam Adrian

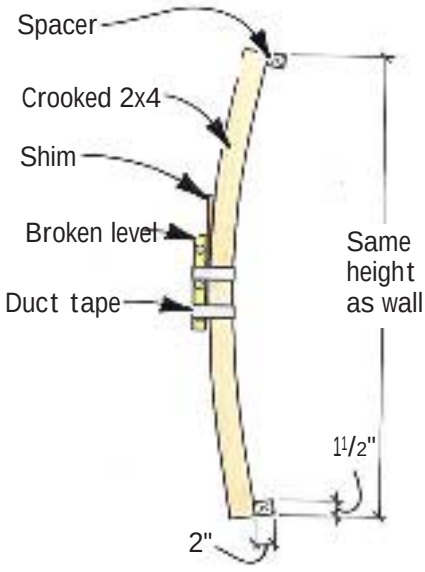
Many tradesmen fall into the trap of thinking they can't do good work unless they buy all the latest gadgets. Fancy tools can make work go faster, but they don't guarantee it'll come out right. I didn't have many tools when I built my first house, but the houses I built early on turned out pretty well. Sixteen years later I own just about every carpentry tool ever invented. But if the houses I built with them were better than those early efforts, it's because I knew more about building, not because I had more tools.

Checking Levels for Accuracy

Knowing the principles behind the way a spirit level works is a good example. I know carpenters who are forever searching through the great assortment of levels bouncing around in the back of their trucks for the one with a vial that proves their work is correct. They'd do better to calibrate all of their levels so that they can be sure their work is right no matter which level they grab. Here's how to do it.

To check a level for plumb, put the level against a flat, vertical surface and take note of where the bubble lands relative to the markings on the vial. The surface doesn't have to be perfect, just flat enough so the level doesn't rock. The surface doesn't need to be plumb, either — just close enough to plumb so the bubble falls near the vial markings. Next, flip the level around (edge for edge, not end for end) so that its opposite edge rests on the test surface. If the vial is properly calibrated, the readings will be identical: Both will read plumb — or out of plumb — by the same amount.

If the readings don't match and the level has adjustable vials, loosen the screws and reposition the vial so it reads



The author uses a custom-made level to make sure he's plumbing wall plates instead of individual studs. With proper calibration, even a crooked stick and a broken level will give accurate readings.

the same when you flip the level edge for edge. If the vials aren't adjustable, put tape over the bad ones so they won't be used. (You can use a similar procedure to check horizontal vials, with two differences: Put the level on a horizontal surface, and flip it end for end rather than edge for edge.)

Plumb Plates, Not Studs

A few years ago I bought a spirit level that expands from 6 feet to 17 feet long. It is a convenient tool for plumbing tall walls and it does save a little time, but it isn't necessary to the accuracy of my work.

If you really know how to plumb a wall, you can do it correctly with a flea market level. Done incorrectly, even a fancy tool won't help produce a good result. For instance, I've seen many carpenters try to plumb walls by placing a 4-foot level on a stud. Studs are almost never perfectly straight, however, and they may not be nailed flush with the plates. If you take a reading on each stud in a wall, all of the measurements will be different; and even if you find a perfectly straight stud, you're plumbing the stud, not the wall.

Site-Built Wall-Level

A wall is plumb when the top and bottom plates are directly over one another; the condition of the individual studs is irrelevant. To plumb the plates, you need to bypass the studs entirely. The fancy telescoping level I bought does this well, but not everybody can afford one, and there will be days when you forget to bring it to the site.

Some carpenters tape a short level to a straight 2x4 and take readings from plate to plate between the studs. This will work, but only if the level is accurately calibrated and the stud is perfectly straight.

My solution is a site-built jig whose sole function is to plumb a wall of given height. It doesn't matter if the 2x4 you use is crooked or if every vial in the level is broken except one. In fact, the unbroken vial doesn't even have to read right. As long as I take a few minutes to calibrate it, my "wall level" will give perfect readings every time.

Making the wall-level. Start by attaching spacer blocks to either end of a 2x4 that's the same height as the wall you want to plumb. The blocks should be wide enough for the level to clear cross braces and bowed studs. Next, tape a level to the opposite edge and near the center of the 2x4.

A wall-level only reads from one side because the edge with the blocks always faces the wall. The easiest way to calibrate a wall-level is to butt it to a surface you can get at from both sides. I like to use a pair of nails driven partway into a wall, one directly over the other. The distance between the nails should match the length of the jig. Drive the nails in straight and make sure the heads are the same diameter.

Now calibrate the wall-level the same way you calibrate a regular level. Butt the spacers to one side of the nails and note where the bubble lands. Flip the unit edge for edge and hold it against the other side of the nails. If the readings don't match, shim between the level and the 2x4 and repeat the test until the readings are identical. Any level can get knocked out of whack, so it's a good idea to check calibration regularly. Since the 2x4 in a wall-level might warp, I test my jig against the original reference nails at the start of every work day.

With a cash outlay close to zero, you can now make a wall perfectly plumb. Using a similar procedure, you can make a custom level for decks up to about 16 feet in width. If you are just starting a business, this could keep you out of the market for an expensive transit or laser for a while.

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