Toolbox

Point-to-Point Lasers

by David Frane

Laser levels have been around for a good 20 years, but until recently, you rarely saw them on residential construction sites. At $3,000 to $5,000 each, the only companies that could afford lasers were those doing large commercial projects or performing specialized subtrades. On big jobs, lasers are used to set elevations for site work, slabs, and suspended ceilings.

Metal-stud framers use them for leveling, or turn them sideways to plumb and align walls.

Six or seven years ago, the construction company I work for bought a rotating laser level. It came in a box the size of a suitcase and weighed as much as a wormdrive saw. Last fall, we bought a second laser alignment tool, a Pacific Laser Systems PLS-5. It weighs less than two pounds, and takes up as much space as a five-pound box of drywall screws. We spent $1,000 for the PLS-5 because it lets us do things we couldn't do with our $3,500 rotating laser.

Lasers, Then and Now

A change in the light source is chiefly responsible for this dramatic drop in size and cost. In early lasers, light was produced by a device similar to a neon tube. But the tubes weren't very efficient, so lasers needed large batteries. A few years ago, toolmakers began to replace tubes with semiconductor diodes similar to the ones used in CD players. They're so efficient they can produce visible beams while running on penlight-size batteries. As a result, laser devices have gotten smaller, lighter, and cheaper.

The vertical beams of the PLS-5 laser can be used to establish plumb lines to the ceiling from layout marks on the floor. The beam is strong enough to be visible on a tape measure, making it easy to check in-place work for alignment.

Rotating vs. point-to-point. A change in the optics have also made lasers more useful. In a rotating laser, the beam bounces off a spinning mirror and hits adjacent surfaces as a continuous reference line. Tradesmen usually orient the unit so the beam sweeps a plumb or level plane. This setup is just the thing for laying out walls and ceilings, but not much help when you need to transfer individual points or create a square layout.

The PLS-5 is one of a new category of tools, the point-to-point lasers. In point-to-point devices, the optics don't move, so light is emitted as a stationary beam that's visible as a small red dot on any surface it strikes. Many companies make point-to-point tools, which range from simple laser-equipped torpedo levels to self-leveling devices that project multiple beams. The PLS-5 has an optical splitter that breaks the light into two vertical and three horizontal beams.

My company bought the PLS-5 because we were having trouble laying out a large custom home. The house had cathedral ceilings and a lot of curved walls, so we couldn't measure off existing work to determine where walls and columns hit the roof. All layout had to be plumbed up from the floor. Many columns were too tall or curved too much to accurately plumb with a spirit level. We were also working on an ocean-front site, where it was usually too windy to use a plumb bob.

Plumb and Level

With the PLS-5, I could plumb up from the floor layout without a helper in any kind of weather. Plumbing a column or wall is a simple matter of positioning the laser so the down-beam hits your layout, then marking where the up-beam hits the ceiling. If you hold your tape at the correct angle, you can even read where the beam hits it. This allows you to check existing work by measuring to see if it's parallel to the light beam. For example, we checked the locations of recessed lights and other overhead components by shooting beams at them from the floor. This saved time because we could do it without setting staging or climbing ladders. Checking existing work was simple, so we found ourselves doing it more often than usual. As a result, we caught mistakes while they were still easy to fix.

The SL-24 Laser Square can project light either as lines, like a rotary laser, or as individual dots, like a point-to-point laser.

Projecting level lines is similar to projecting plumb lines. The only difference is that you use the horizontal beams. The PLS-5 comes with a magnetic bracket designed to stick to metal studs. Once mounted, you can pivot the laser to project a number of points that define a level plane. You can also mount the laser on a standard camera tripod. According to the manufacturer, the PLS-5 is accurate to 1/8 inch over 100 feet.

Be Square

The traditional way to create square layout is to draw a large 3-4-5 triangle on the floor and check the hypotenuse with a tape. But many times, obstructions force you to make a triangle that is too small. Usually, the triangle legs can be extended with a chalk line, but it's not hard to make mistakes and end up with a layout that's out of whack.

The beams from a PLS-5 are perpendicular to one an other, so you can use them to create a square layout. With the laser sitting on the floor, the beams project an inch or so above floor level, and the manufacturer supplies a self-plumbing target to transfer marks to the surface. Getting a square layout is a no-brainer, because you don't have to do any math or read a tape.

The pair of perpendicular light beams projected by the self-leveling LeveLite SLX can be used for laying out square, level, or plumb lines.

Self-leveling devices are quicker and easier to use than those you level by aligning a bubble in a vial. The optics in the PLS-5 are hung from a gimbal mechanism that automatically levels itself, provided you initially position the unit to within 8 degrees of level. It's not hard to do this, but if you don't, the PLS-5 has a built-in fail-safe feature: It won't emit a beam, so you can't project lines that aren't plumb or level.

Before You Buy

When we bought a PLS-5, we thought we'd reached the limit of versatility in an alignment tool. But toolmakers have barely scraped the surface of what can be done with point-to-point laser technology. New and improved alignment tools are being introduced regularly, and while we're happy with the PLS-5, if we were buying now we'd take a second look at improved versions of two lasers we passed over the first time.

SL-24 Laser Square. The interesting thing about the Laser Square is that it can project individual dots like a point-to-point laser as well as solid lines like a rotary unit. Also, the SL-24 isn't self-leveling, so you can tilt it to project visible lines onto floors and walls: Visible lines are much easier to deal with than lines you have to transfer to the surface by squaring or plumbing.

Laser Square's two beams are perpendicular, so you can use them for square layout. Thumb wheels and spirit vials allow you to level the laser unit to project level lines, but we passed on it because it couldn't do plumb lines. The SL-24 weighs about a pound, is accurate to 0.2 inches in 50 feet, and retails for around $900.

LeveLite. We seriously considered buying a LeveLite SLX. It's a self-leveling alignment tool with a pair of perpendicular beams that allow you to lay out square in any plane and to project a single plumb or level line. At $500, the SLX was a relative bargain. We didn't choose it because the method for aligning it with floor layout was cumbersome. LeveLite recently introduced the TriLite, a three-beam model that uses index marks rather than a separate target to pick up floor layout. TriLite retails for around $700.

No law says you have to go out and get a laser alignment device, but then no one had to force me to replace my Yankee screwdriver with a cordless drill, either. ■

Sources of Supply

PLS-5
Pacific Laser Systems
449 Coloma St.
Sausalito, CA 94965
800/601-4500

Laser Square
L.P. Industries
P.O. Box 2406
Bridgeview, IL 60455
708/425-8987

SLX and TriLite
LeveLite Technology Inc.
476 Ellis St.
Mountain View, CA 94043
800/453-8354