

PLS90E 90-Degree Layout Laser

by Tim Uhler

The framing crew I run has long used a PLS5 for layout. Its five beams appear as dots and allow the user to shoot plumb, level, and square. A few months ago, *JLC* sent us a new PLS laser to test — the PLS90E. Unlike the older tool, which is a general-purpose layout laser, the PLS90E is designed specifically for laying out square. It doesn't shoot level and can't be used as a plumb bob.

However, it does do something other lasers can't: It shoots a pair of beams that fan out to form vertical planes of light exactly 90 degrees apart, with enough spread to project square layout onto flat and sloped surfaces. (This tool should not be confused with flooring layout lasers, which work only on flat surfaces and are not designed for outdoor use.)



PLS90E Specs

Working range: 250 feet

Dimensions: 2 inches by 2⁷/₈ inches by 3³/₁₆ inches

Weight: 1.7 pounds

Power supply: Three AA batteries

Self-leveling range: 6 degrees

Accuracy: 1/8 inch at 100 feet

Street price: \$550 for kit version

Pacific Laser Systems
800/601-4500
www.plslaser.com



First Impressions

The first thing I noticed when I opened the box and turned on the PLS90E was how bright the laser lines were: They're easily visible indoors. Next I noticed that the beams project above and below the horizon — or plane — the laser is set on; this means we can do square layout without plumbing down from horizontal beams as we have to do with the PLS5 (see "Framing the First Floor Deck," 12/06).

The PLS90E kit contains a universal base, a floor target, a detector (so you can use the laser outdoors), and a case. Some online vendors throw in a tripod.

Setting Up

Provided that it's positioned within 6 degrees of level, the PLS90E is self-leveling. A plumb beam projects down from the bottom of the unit when it's on; this beam is used to align the tool over the corner of the

90-degree angle that's being laid out. The laser can be used with or without the universal base, which can be placed on a flat surface or attached to formwork or batter boards with a built-in clamp. It can also be placed on a surveyor's tripod: If the top of the tripod is set close to level, the plumb beam can project through the hollow fastening nut. (A photography tripod won't work because there's no hole for the down beam to go through.)

The first step in establishing accurate layout is to create a reference line. If we did earthwork or formed footings, the reference lines would be represented by nail heads in stakes driven into the ground, or by marks on batter boards. Since we're framers, we snap our reference lines onto flat surfaces like foundation walls, slabs, and floor decks. I like to snap the longest straight wall and then align one beam of the laser to that.

Fine Adjustment

With most lasers, aligning the beam with an existing line is easier said than done. If the wall is long, moving the laser just a little bit at one end moves the beam a lot at the other. For example, if you want to move the beam $\frac{1}{16}$ inch from 50 feet away, you've got rotate the laser some tiny fraction of a degree; it's easy to overshoot the mark.

With the PLS90E, we don't have this problem because there is a fine-adjustment dial — a thumb-wheel — on the back. Turn the wheel, and the beams — which remain 90 degrees apart — rotate on a vertical axis. It's easier and much more precise than rotating the unit itself.

Once we have one beam aligned with our snapped line, getting square layout is simply a matter of marking where the other beam hits the surface and then snapping through to the corner mark. That's easier than what we do with the PLS5; its down beam is an inch forward



The PLS90E projects a pair of beams that fan out to form vertical planes of laser light exactly 90 degrees apart (left). Since the beams are plumb, the lines up the walls are plumb and the lines on the ceiling are directly over the lines on the floor (right).



of the side beams. If we align the PLS5's down beam with the corner point and mark where the side beams pass over the surface, we have to remember to shift the line an inch forward from the marks. Making that shift isn't rocket science, but every now and again someone forgets to do it and then the layout is wrong.

Steps and Slopes

When the new PLS tool arrived, we were just getting ready to lay out the sills on a foundation that stepped down a hill. Laying out a line on a wall that steps down is a hassle. In the past, we projected a horizontal laser beam above the wall, held a level so that the beam clipped the edge of it, and then plumbed down to the wall — a time-consuming task that required two carpenters.

Now we can put the PLS90E on a tripod where two walls meet, align one beam with a line on the level wall, and project a perpendicular line onto the

tops of the steps in the wall on the hill. The steps may partially block the beam, but if the tripod is high enough it will hit enough of each step that we can finish the line by plumbing down the faces and connecting the dots. It's a one-man job and a lot faster than creating a line by plumbing down from a beam.

It's also possible to lay out from the downhill side. In that case, the beam will run in a continuous line up the first few steps, but it will hit only the faces of steps above the height of the tripod. To complete the line, the operator must plumb the rest of the way down the faces and snap lines between the outside and inside corners.

If we did our own formwork, there's no reason we couldn't use the PLS90E to produce square layout for excavations and footings. One of the major selling points of this tool is that it can project square layout onto any surface — including dirt on a sloping grade.

Detector

Seeing laser beams is difficult when you're working outdoors. That's why this laser comes with a detector, which beeps when hit by the beam. You can also turn off the sound and view the arrows in the display, which get bigger or smaller depending on whether you're moving the detector in the right or wrong direction.

Together, the detector and the laser's adjustment dial make it possible for just one person to align the tool with an existing line: First, the operator centers the detector on the line at the far end of the wall; then he places the laser over the corner point at the near end; and finally he aims the beam so that it hits the detector dead-center. The detector's beep tones indicate whether the beam is getting closer or farther away, or is perfectly aligned. If the wall is long, hitting dead-center may take some tweaking, which is where the fine-adjustment dial comes in; it moves the beam in very small increments.

By the way, the detector is very loud at full volume. This is good when you want to hear it from a long distance, but can be ear-shattering if you work right next to it without hearing protection. Fortunately, a button on the unit allows you to adjust or mute the volume.

Plumb

The beams that come out of the PLS90E are plumb, so in addition to using the tool for square layout we can also use it to shoot one line on the floor and another directly above it on the ceiling. That's helpful when we're framing partitions: We can fasten the bottom plate to the line on the floor and the top plate to the line on the ceiling, and we know the wall is plumb.

You can also use this tool to lay plumb lines up a wall.



The user aligns the beam that projects from the bottom of the unit over the corner of the 90-degree angle he's laying out (left). When the PLS90E is attached to a surveyor's tripod, the down beam has a clear shot to the ground through the hollow fastening nut in the top of the tripod (right).

Should You Buy It?

Whether the tool is right for you depends on the kind of work you do and what lasers you already own. If you spend a lot of time doing square layout outdoors and need to project a laser up and down grades, I'd say the PLS90E is worth the \$550 price tag.

But since it can't shoot level and isn't the best tool for shooting plumb, you'd still need another laser for those functions. Our crew has a rotary laser that we use exclusively for projecting level lines, and we continue to use our PLS5 for plumb and level.

We lay out square with our new PLS90E. We figure it'll pay for itself by increasing the speed and accuracy of our layout.

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An electronic detector helps users find the beam in bright sunlight.

Multifaceted. The *Charge AL* from Leatherman packs eight tools plus a pair of multifunction pliers. The clip-point and serrated blades, saw, and diamond-coated file can be used without opening the tool body; the screwdrivers, scissors, and combination bottle/can opener are tucked inside the handles. The product costs about \$100.

Leatherman, 800/847-8665, www.leatherman.com.



Quick Assist. I've kept a SOG *Flash* in my pocket for several years now. It's amazingly sharp and has a reversible clip that keeps it secure and within reach at all times. My favorite feature is the mechanically assisted blade, which opens very quickly — hence the name. It comes in two sizes and numerous blade and handle styles. Prices start at \$55 for the 2½-inch-blade Flash I, and at \$72 for the 3½-inch-blade Flash II.

SOG, 888/405-6433, www.sogknives.com.



Keep Sharp. Few things are as frustrating as trying to cut with a dull edge. The FastCap *TriBlade* utility knife uses breakaway segmented blades, so getting a fresh edge is fast and easy. Two extra blades store in its rubber-gripped handle. Best of all, this knife's a bargain: You can get one with 10 extra blades for about \$5 on the Web.

FastCap, 888/443-3748, www.fastcap.com.



Toolbox | Heavy Equipment

Shrink to Fit. The new John Deere 17D compact excavator's undercarriage and tracks retract, so it can fit through openings as small as 40 inches wide. Once in position, its tracks can be re-extended for stability. The 4,200-pound excavator can dig a little more than 7 feet down, with a maximum reach of 13 feet. Prices start at around \$30,000.

John Deere, www.deere.com.



Multiple Attachments. While a loader/backhoe is already one of the most versatile pieces of heavy equipment you can buy, a three-point hitch increases its utility even further. The diesel-powered 26-hp, four-wheel-drive B26 TLB from Kubota has a 1,300-pound-capacity loader and a backhoe that can dig to nearly 8½ feet. A conventional three-point hitch accommodates such varied attachments as box graders, chipper-shredders, mowers, and snow blowers. Prices start at around \$30,000.

Kubota, www.kubota.com.

Little Loader. Navigating around a tight urban or suburban lot in a piece of heavy machinery is tough — and no one wants to see the landscaping torn up, either. That's why walk-behind loaders like Bobcat's MT52 are becoming so popular. This relatively small machine can do many of the same tasks as its larger brethren, but requires a fraction of the space and exerts minimal ground pressure (5.2 pounds per square inch). Prices start at around \$17,600.

Bobcat, 701/241-8700, www.bobcat.com.

