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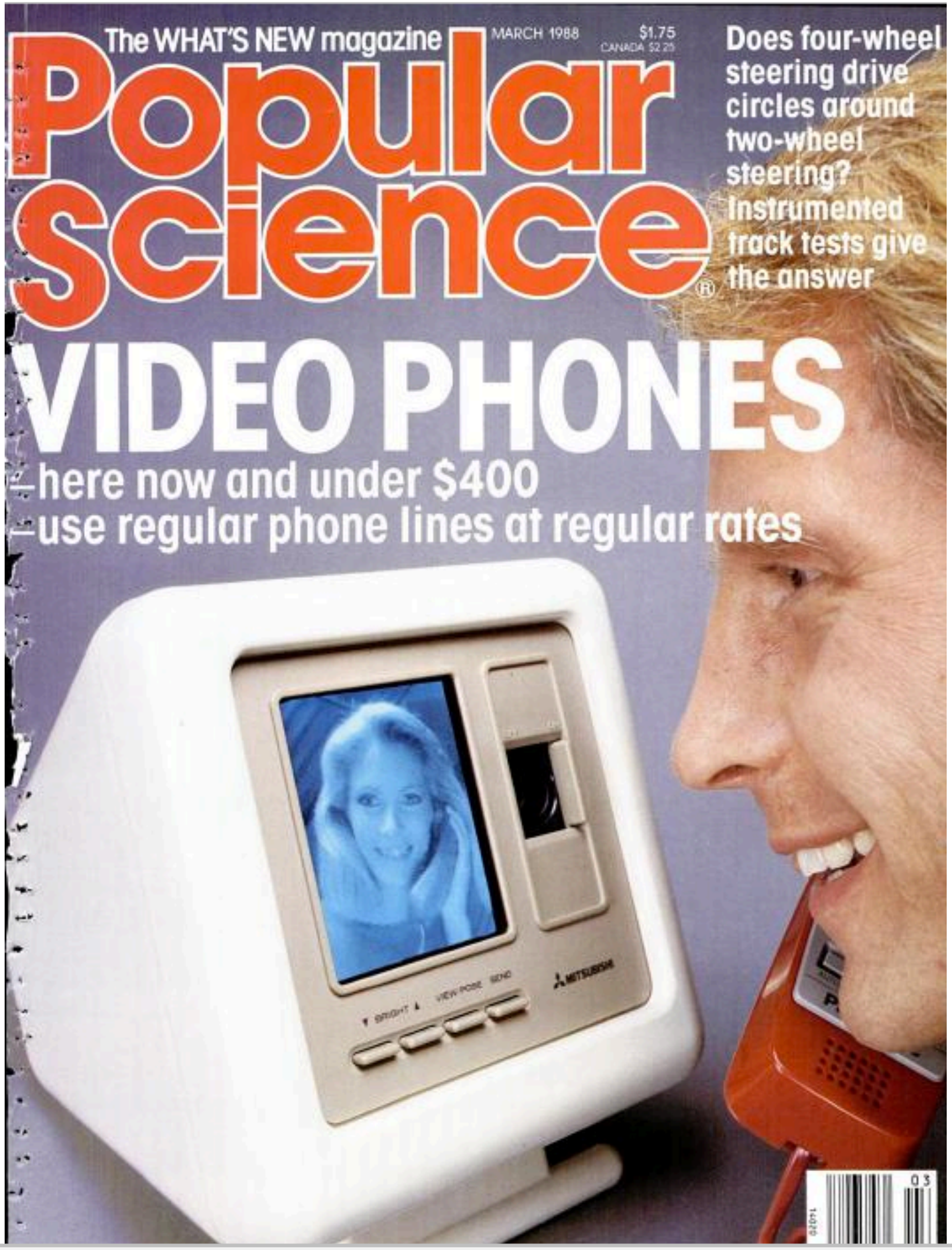

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Video phones

Your telephone rings. You press a button and see the caller. Press another button, and he sees you. Phones like these once required special phone lines and cost thousands of dollars to buy or rent, relegating them largely to business use. Now, at $399, they're made for your home. Page 60

Battle blimps

For years airships seemed to be anachronisms waiting to die. Now they may regain some special aerial niches: The Navy may build blimps to watch for sea-skimming missiles—a job patrol planes and helicopters can't do as well. Page 56

Picks of the pros

Popular Science invited five workshop experts to name some unusual tools they wouldn't live without. Here are 10 of their favorites—from a cordless screwdriver to a foot-inch-fraction calculator. Page 73

4-wheel vs. 2-wheel steer

Does four-wheel steering drive circles around two-wheel? We test the 4WS and 2WS versions of the Mazda 626 and Honda Prelude Si to find out. Page 30

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Home, Shop, and Yard

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COVER PHOTO BY GREG SHARKO

Readers Talk Back

Century-old new technology

I thought you would be interested to know that the "new" no-show nailer described in January's "What's New In Tools" is 100 years old! Stanley introduced it in 1888 at a price of $2.40 per dozen. The popularity of this tool faded early this century and in 1922 we discontinued it.

Carl C. Stoutenberg
Product Line Engineering Manager
Stanley Tools
New Britain, Conn.

Is it popular science?

I enjoyed reading the December 1987 issue until I opened the magazine to pages 62 and 63. Right next to the article about Nissan's sonar suspension was a piece about the free-electron anti-missile laser system. The Japanese are using their brains to produce something they can sell to people all over the world. We, however, are blindly forging ahead with our multi-million dollar "Star Wars." Is this really "popular" science?
Richard L. Rathbun, Palo Alto, Calif.

Elusive door closers

In your December 1987 article "Make Yourself a Panel Saw," the plans call for two sliding door closers to counterbalance the saw weight. I spent nearly a full day going to or calling every hardware store, woodworking store, and building-supply store in my area to no avail. Please help!
David R. Johnson, Minneapolis, Minn.

Although author R. J. De Cristoforo assures us he purchased the door closers at a local hardware store, readers across the country have found them difficult to obtain. The unit he used was a Shelby Sliding Door Closer No. 333, made by the Shelby Spring Hinge Co. of Shelby, Ohio; attempts to reach the manufacturer by phone, however, brought news that there is no such listing. De Cristoforo says a reasonable substitute would be spring-type window sash balances. He also suggests trying a couple of radial-arm-saw carriage returns, such as the $30 type shown on page 147 of Sears' Power and Hand Tool catalog. To accommodate the greater travel of the panel saw, Cris says you might have to braze on an additional length of cable. Cris regrets this inconvenience to readers.—Al Lees

Address letters for this column to: Readers Talk Back, POPULAR SCIENCE, 380 Madison Ave., New York, N.Y. 10017. We are unable to acknowledge unpublished letters.

Wood stove woes

In regard to the December 1987 article "Wood Stoves Must Clean up Their Act," I agree that wood-stove emissions do exist and some correction of this situation would be desirable. However, the Environmental Protection Agency statement that wood stoves account for 15 percent of the nation's particle matter is hard to believe. The agency also claims that wood-stove cleanup will "net the U.S. an annual savings of $29 million in related health costs...." This would put wood stoves in the same category as alcoholism and drug addiction. Maybe we should try to get people to quit using wood stoves and forget about cigarette smoking.
Raymond A. Schwarz, Northbrook, Ill.

Scanning the bumps

In your article on sonar suspension [Dec. '87] you say, "The sonar suspension reads major dips in the surface, along with bumps, ripples, potholes, metal grids found on some bridges, and other impediments...." If a car is moving at 60 mph and the ultrasonic device has a pulse repetition of 40 hertz, this leaves about 2½ feet between pulses. It seems that the beam spread is not great enough to pick up every road imperfection and the sensor could miss a pothole or metal grid.
Randy Lachermeier, McHenry, Ill.

You're quite right. The object of this system is not to respond to individual surface irregularities, but to read an average.—Jack Keebler

Flip fascination

I was fascinated by the January article on Earth's flipping magnetic field, especially the possible tie of the chang-

Continued

letting cooling breezes waft through.

To build the gazebo, set the outer posts of the structure first, making sure they are plumb before setting the additional front deck-support posts in line with them. I set the posts three feet into the ground without using concrete.

Use zinc-plated carriage bolts for additional strength and rust resistance when attaching the 2×6 deck-support stringers to the support posts. Nail on the front 2×6 facing, which will support the front deck 2×4.

When I laid the 2×4 deck boards, I left a ⅛-inch space between boards for drainage. Wait until the deck is attached before trimming the 2×4s to match the structural angles. Give the top of the structure a front-to-back slope of about seven inches (or five percent) to give an illusion of spaciousness.

When it's time to attach the upper front 2×6 facing, be sure the front posts are the same distance apart at the deck and at the top. Nail on 2×4s to complete the top framing after rabbeting their inner faces to take the overhead lattice sections. Vertical lattice sections can be attached to the upright framing in one of two ways, depending on the tools you have. Either cut a groove in 2×2s the width of the lattice, as shown, or nail beveled cleats on each side of the lattice. One edge of each vertical 2×2 or cleat will need to be cut at an angle its full length to match the angle it will set against the 4×4 post.

The lattice sections can be easily cut with either a handsaw or power saw, but handle the panels carefully to avoid dislodging the staples used in their construction. I designed the two front side sections at a shorter 45-inch height to give the structure a more open, airy feeling. The back panel is in two sections, with the top one hinged so you have the option of closing it for additional screening or dropping it for more ventilation. To wind up construction, you can add triangular decorative trim at the upper front corners.

When the structure is completed, apply a preservative like Woodlife. Afterward, you can apply a redwood stain if you wish to retain the red color. If no stain is applied, all redwood gradually changes to a weathered gray color.

Your own personal touches complete your leisure retreat. Twin cushioned redwood chairs on the deck invite backyard relaxing, and a matching chaise lounge may attract sunbathers to the semiprivate area in front of the structure. The intriguing design of the redwood lattice invites creative use of the remaining scrap, such as forming a border trim along the front of an adjoining flower bed.

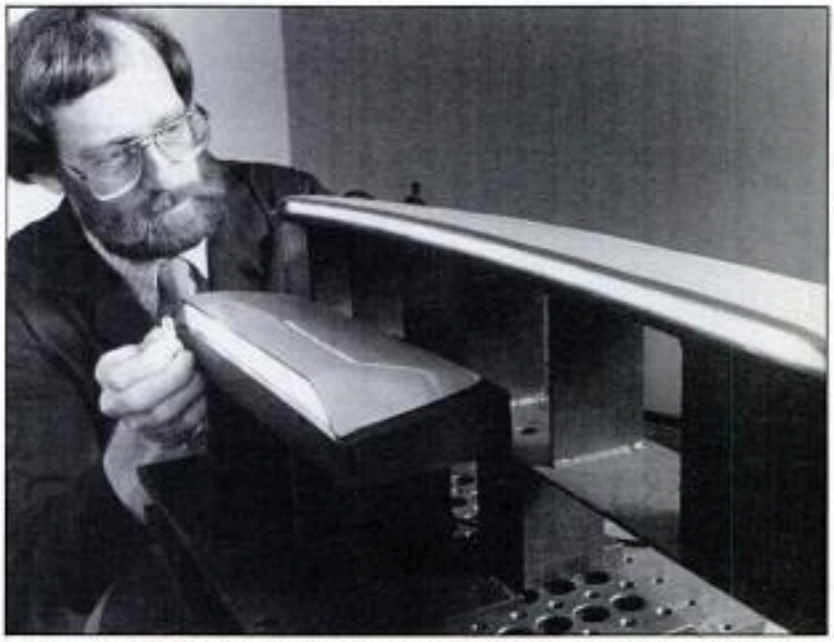
Stop! It's an LED

A light-emitting diode would be the last thing on your mind when a speeding car cuts you off and suddenly brakes. But it may be responsible for making you brake earlier, maybe harder, than usual. Stop lamps using high-intensity LEDs—some producing light up to 10 times as intense as conventional LEDs—may make driving safer as taillights take on a richer glow. Many say the new LEDs produce a more conspicuous and pleasing red.

The Nissan 300ZX was the first car to use them—for the center high-mounted stop lamp required in new U.S. cars since the 1986 model year. General Motors Corp.'s Fisher Guide Division (Anderson, Ind.) has developed a similar lamp for the Corvette. With only the price barrier to overcome, other car makers are likely to follow.

High-intensity LEDs aren't brighter than incandescent brake lights; federal law requires output to fall within a certain optic range. But they "*appear* much brighter," says Ken Matsumoto, director and general manager of I I Stanley Co., Inc. (Battle Creek, Mich.), one of the world's leading producers of high-intensity LEDs.

Engineers have thought of using LEDs in automotive lighting for a number of years. Their size allows designers much more flexibility: A typical LED element is about twice the size of a match head. LEDs also consume less power than incandescent bulbs, says Gene Wright, a staff project engineer at Fisher Guide. "They're immune to vibration," he adds. "And they should last the life of the car."



The LED's tiny size helps streamline a center-mounted automobile brake light.

High intensity is achieved by using aluminum-gallium-arsenide semiconductor material—instead of gallium-arsenide-phosphide—and concentrating the light it emits into a beam. "Basically, an LED that emits a thousand millicandelas is just better collimated [or focused] than one that emits a lower value," says Wright.

The center high-mounted stop lamp is just the beginning. LEDs cannot replace white headlights and backup lights. They come only in red, yellow, green, and blue; so far red is the only color capable of high intensity. Matsumoto says the others turn into different colors the more their pure hue is intensified.

Unlike filament bulbs, however, LEDs are sensitive to temperature change. "As the temperature goes up, their output goes down, and as the temperature goes down, their output goes up," says Wright. "But we compensate for that." If not, you may find yourself braking more softly in the summer.—*Eduardo R. C. Canalong*