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THE WHAT'S NEW MAGAZINE

# Popular Science

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1998

COVER ART  
DANIELS & DANIELS



DEPARTMENT

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Flying on Mars; Lyme disease vaccine; global-climate protocol; before birds had wings; Blackbeard's treasure.

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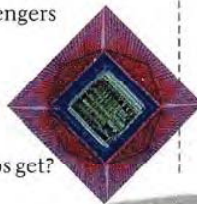
**70 Urban Rainforest** Leaf by leaf, vine by vine, an African jungle sprouts on New York's west side.

### COMPUTERS & SOFTWARE

**29 Computers & Software Newsfront** Software modems; virtual tax man; inoculating the Net; removable cartridges grow PC storage.

**54 Wired Wheels** Check your e-mail and get directions while driving, as your passengers browse the Web and watch TV.

**64 Computing's Outer Limits** As they bump up against laws of physics and economics, how much better can chips get?



### AVIATION & SPACE

**56 What's Next for Hubble** The once-derided telescope will continue its remarkable finds into the next century.

**62 A Plane for Land and Sea** Agile and stealthy, with plenty of range, France's Rafale may be the most versatile aircraft in the sky.



### HOME TECHNOLOGY

**45 Home Technology Newsfront** The Health Home; for consistent temperature, a furnace with finesse.

### AUTOMOTIVE

**37 Automotive Newsfront** Sledgehammer-proof windows; beating driver drowsiness; more salt for the Salt Flats.

**72 Hybrids Get Real** Energy-efficient vehicles are hitting the street. Is mass acceptance down the road as well?



### ELECTRONICS

**32 Electronics Newsfront** Virtual visits via a camera in the round; interactivity on network and cable TV.

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## Surviving Baptisms of Fire

AS A NATIVE OF BROOKLYN, NEW YORK, I've experienced firsthand two of the great engineering projects of the modern age. I've walked, driven, and bicycled across the 115-year-old Brooklyn Bridge—once the world's longest span—and the Verrazano-Narrows Bridge, still the lengthiest of its type in the United States. Now, however, I'm envying residents of Japan, where the greatest bridge-building project of all time is near completion. With a total span of nearly two and a half miles, the Akashi Kaikyo Bridge will complete a link of Japan's four main islands. Built to resist earthquakes and typhoons, the unfinished bridge weathered an early test when it withstood the Kobe earthquake. Our report takes you step-by-step through the massive engineering feat.

Also surviving a stormy birth, the once-derided Hubble Space Telescope has generated enough amazing celestial data to keep astronomers busy well into the next century. Executive Editor Mariette DiChristina, who has tracked Hubble's progress since its problem-plagued early days, looks ahead to its next decade of work.—Fred Abatemarco

## Home Automation

YOUR READERS MAY be interested to know that, at least for owners of Macintosh computers, home automation—including voice-activated features—has been available for some time [Home Technology Newsfront, Dec.]. Several companies sell the equipment and software, including Sand Hill Engineering ([www.shed.com](http://www.shed.com)). More information is also available at [web.cs.ualberta.ca/~wade/HyperHome/top.html](http://web.cs.ualberta.ca/~wade/HyperHome/top.html).

John Atwell  
[kermit@chiangmai.a-net.net.th](mailto:kermit@chiangmai.a-net.net.th)

## The Color of Light

CONCERNING YOUR article about the dangers of halogen lamps ["The Light Stuff," Home Technology Newsfront, Oct.], I must say that I am tired of halogen lamps getting a bad rap. We have sold them in our lamp shop for many years and have never had a problem with them. They are good light sources because of the color of light that they produce. Some of our customers with sight problems buy halogen lamps because their doctors have told them that the lights help print show up better when reading.

Stanley Weintraub  
Austin, Texas

## Supply and Demand

YOUR ARTICLE "Hot Water on Demand" [Home Technology Newsfront, Nov.] would have us buy a pump that circulates cooled-off hot water back to the water heater via the cold water line. For years, we have been told to use only cold water for drinking and cooking, because hot water dissolves more contaminants from pipes. This pump would transport any contaminants dissolved in the hot water line to the cold water line for everyone to drink.

Bruce Keane  
[b.m.keane@juno.com](mailto:b.m.keane@juno.com)

*While it is true that warm water, because of its temperature, would dissolve more metallic salts than cold water, the U.S. Environmental Protection Agency considers hot and cold water to be potable in every state.*

*This is because newer pipes, such as those made from polyvinyl chloride, or PVC, leach virtually no contaminants into drinking water. In older homes, however, where copper piping and lead soldering are common, the EPA cautions against consuming both hot and cold water. For more about common water contaminants in your particular area and how to protect yourself against them, contact your local health department.*

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Address: 2 Park Ave.,  
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## Measuring Up

HOW CAN IBM'S Thinkpad 770 [Best of What's New, Dec.] have a 14.1-inch screen when its dimensions are 2.2 by 12.3 by 10 inches?

Carol Dunn  
carol87@juno.com

*The 14.1-inch value refers to diagonal length across the screen.*

## Pilotless Planes

I FOUND YOUR ARTICLE "Fighters Without Pilots" [Nov.] intriguing. However, if the goal is to deliver firepower cheaply, without risk to the pilot, then it seems logical *not* to design a pilotless fighter, but to expand the capabilities of existing guided and cruise missiles. Added range and real-time control of missiles would provide the same capabilities at a fraction of the cost. Once a missile detonates, the remote pilot would then switch over to another missile loitering on the edge of the combat zone, and fly it to the next air or ground target. A similar concept was illustrated nearly 70 years ago in the seminal Buck Rogers book *Armageddon 2419 AD* by Philip Francis Nowlan.

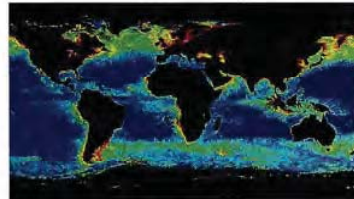
Noel Munson  
nmunson@wajones.org

I LOVED YOUR article about unpiloted combat air vehicles. After contemplating their control systems, I

thought of two ways an enemy aircraft could disable an entire fleet of these aircraft: either take out the communication satellite or destroy the lead aircraft in the fleet, which would interfere with the control systems of the remaining vehicles.

Brian Kirkpatrick  
mrrin71.mail@aol.com

*Good tactics, but there are ways to deal with both. Satcoms could use constellations of low-flying satellites—with many spacecraft constantly switching message paths—or geostationary satellites. Taking out a constellation requires a series of anti-satellite-weapon engagements, while geostationary satellites are too high to be easily damaged. As for destroying the lead aircraft, all vehicles could perform the "leader" and "wingman" roles. If the leader is shot down, another vehicle would take over.*



**Correction:** The NASA SeaWiFS (Sea-viewing Wide Field of View Sensor) image ("The Color of Chlorophyll," What's New, Jan.) is incorrect. The corrected image above shows the highest concentrations of underwater chlorophyll in red and the lowest in purple.

## "Best of What's New" Readers Choice Awards

IN OUR DECEMBER ISSUE, we asked readers to choose their favorite 1997 "Best of What's New" product or technology from our 100 award winners. We're pleased to announce nearly 6,000 of you responded and, with 36 percent of the vote, the HyperSonic Sound speakers from American Technology Corp. took top honors. Producing a pair of ultrasonic signals that are audible only when they hit an object, the speakers provide extraordinary at-home surround sound. A list of the top 10 favorites and voting results is available at [www.popsci.com/bown](http://www.popsci.com/bown).



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# WIRED Wheels

TODAY'S MODERN CARS have become a complex system of rolling electronics, mirroring the computer age we live in. But aside from your cellular phone, your car rarely communicates with the outside world—or with you. The era of automotive solitude is coming to a close, however.

Delco Electronics (a unit of GM), IBM, Netscape, and Sun have teamed up to create the world's best-connected car, dubbed the Network Vehicle. This demonstration car meshes the usual auto electronics with a host of audio, video, computer, phone, satellite, and GPS devices, all linked by a looping network within the car. You can't buy a Network Vehicle yet, but Delco and IBM predict you'll be able to purchase a car like it in three to seven years.

In the meantime, the Network Vehicle provides plenty of technological teasers. Once inside, a voice-recognition system lets you talk to your car, and allows your car to talk back to you. A satellite dish embedded in the car's roof and LCD screens built into the car seats provide both TV programs and Internet access. A cellular phone and a head-up display system let you communicate while driving. Your vehicle's own Web site and GPS system give you new control, navigational, and emergency options. And most components can work together with interesting results.

When something goes wrong in your Network Vehicle, for instance, it warns you with an audible message. You can then call a service center for help; the center can do a diagnostic check remotely and access your car's maintenance log. And if you get stuck or lost, they can dispatch help to your exact location by reading your GPS signals, or provide directions to the nearest gas station or hotel.

A new "network vehicle" lets you check e-mail while driving, as your passengers browse the Web and watch TV.



By Suzanne Kantra Kirschner

The Network Vehicle also lets you keep in touch while you drive. The head-up display alerts you to incoming calls or e-mail messages by projecting icons that appear to be visible beyond the car's hood—where your eyes would be anyway. You can vocalize your wish to answer the call or have the e-mail read to you aloud. The navigation system is also linked into the head-up display, projecting turn-by-turn instructions. And the voice recognition system lets you dial the phone, select a radio station, or retrieve traffic updates, stock quotes, and news via the Internet.

You can customize your drive time, too. A docking station for IBM's WorkPad handheld computer (similar to 3Com's Pilot) enables you to download your schedule into the car for better route planning. And the navigation system can keep a mileage log for easier expense reporting. Passengers won't get bored, either. They can watch pay-per-view movies and standard TV fare via the DirecTV satellite service, or use the touch-screen color LCDs to surf the Web using its companion high-speed Internet service, DirecPC.

Some of the Network Vehicle's most tantalizing aspects stem from the fact that it's essentially a mobile Internet server with its own Web address. Amenities such as radio presets, seat position, and cellular phone numbers can be programmed while sitting at a computer. More importantly, perhaps, you can use the Internet connection to remotely lock your car, turn off the lights, or even shut off the engine if the vehicle's been stolen.

The Network Vehicle won't be alone on the high-tech highways. Clarion and Intel have less elaborate computer car systems that should be available later this year. ♦



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