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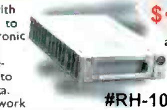

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April 2002, Vol. 3, No. 4

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Poptronics (ISSN 1526-3681) Published monthly by Gernsback Publications, Inc. 275-G Marcus Blvd., Hauppauge, NY 11788. Second-Class postage paid at Hauppauge, NY and at additional mailing offices. One-year, twelve issues, subscription rate U.S. and possessions $24.99, Canada $33.15 (includes G.S.T. Canadian Goods and Services Tax Registration No. R125166280), all other countries $33.99. Subscription orders payable in U.S. funds only, International Postal Money Order or check drawn on a U.S. bank. U.S. single copy price $4.99.

Printed in U.S.A.
Postmaster: Please send address changes to Poptronics, Subscription Dept., P.O. Box 459, Mount Morris, IL 61054-7629

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Hauppauge, NY 11788
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Hide and Hugo Seek!

We decided to have some fun this month by playing a game with our readers. The name of the game is Hide and Hugo Seek, and it's easy to play and win. Three images of Hugo Gernsback's head have been hidden within the pages of this issue. All you need do is find the three heads, write the page numbers where they were found on a postcard, and mail the postcard to: **Hide & Hugo Seek, 275-G Marcus Blvd., Hauppauge, NY, 11788**. There will be twenty contestants randomly chosen from all the correct entries that have been postmarked no later than April 30, 2002. Winners shall receive a prize package of various goodies from Uncle Hugo's Voltage Vault. No purchase is necessary, so if you cozy up with a copy of **Poptronics** at your local bookseller or library, you can play too! So, what are you waiting for? Go find Hugo's head.

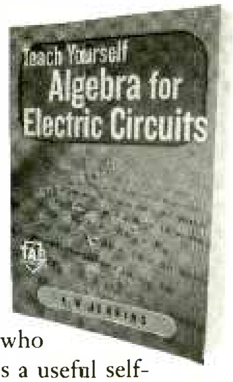
In other news...the latest boom in technology is sure to be focused around fuel cells. Readers may remember the fuel-cell series that appeared in "Amazing Science" during February, May, and June of 2001. Author John Iovine told our readers about the various versions of these alternative fuel sources, and then he even showed us how to make our own energy-yielding cells. Now, everywhere from Texas to Tokyo, investors are backing ventures that are researching and developing alternative forms of energy that would incorporate fuel cells. Japan's *N*ational *S*pace *D*evelopment *A*gency (NASDA) and Tokyo's Institute for Laser Technology are working together to develop one such project, "New Sunshine." Mashiro Mori of NASDA told members of the Associated Press about this program, and how it would employ *L*ow *E*arth *O*rbit (*LEO*) satellites that would collect solar energy to be fed to a *solar pump.* The solar pump transfers photons of sunlight into a solid-state laser. The laser amplifies the sunlight into approximately ten megawatts of energy. Finally, the laser is aimed at a tank of seawater that has been treated with a breakdown catalyst (titanium dioxide). The tank also has an optic array mounted above it for concentrating the incoming beam fired from the LEO satellite. The resulting blast of energy would be used to rip apart water molecules. This is only one of several alternatives to ordinary electrolysis. Opponents have argued over the fact that it takes electricity to create electricity in the case of electrolysis. Another popular alternative is the so-called "bug-batteries," which use living microbes to break down various hydrogen-yielding compounds. What's this mean to us? Well, experts don't foresee a widespread availability of fuel-cell cars until at least 2010, but there is no doubt in my mind that fuel-cell companies, cooperatives, and ventures will be popping up like prairie dogs. By the way, this is April's issue and we've included our traditional April Fool's feature. This time we relied on an old pro of the goof genre. The joke's on us though, because as absurd as this story sounded over fifty years ago, fantasy became reality.

Happy Reading,

Chris La Morte
Managing Editor

NEW LITERATURE

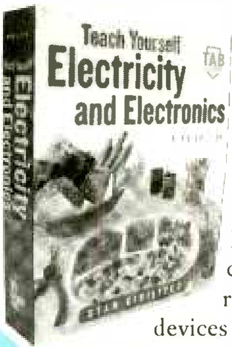
Teach Yourself Algebra For Electric Circuits



by K. W. Jenkins
McGraw-Hill
Two Penn Plaza
New York, NY 10121-2298
800-2MCGRAW
www.books.mcgraw-hill.com
$34.95

This self-tutoring guide, specially geared for those who work with electric circuits, is a useful self-enrichment tool for upgrading math skills and learning the methods that support today's technological growth. It contains hundreds of practical problems with detailed solutions as well as over 300 illustrations for easier comprehension. Also included are circuit-focused applications and special help with the algebra of logic and matrices.

Teach Yourself Electricity and Electronics, Third Edition



by Stan Gibilisco
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Learn the fundamentals of computing, communications, robotics, and entertainment devices through this introductory course in electronics. The text offers a user-friendly, independent-study approach, complete with practical examples, learning-enhancing illustrations, and test-yourself questions. Perfect for both hobbyists and students, this edition presents simple circuit design, new information on wireless technologies, advanced applications in artificial intelligence, and more.

Digital Electronics Guidebook

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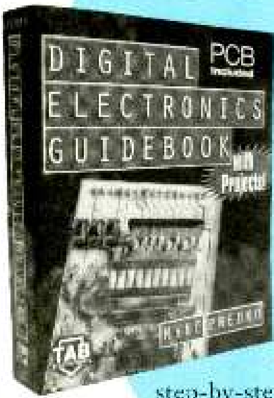

Intended for electronics hobbyists and students who want to understand digital logic, this book features more than 20 projects for designing, constructing, and interfacing TTL (Transistor-Transistor Logic) circuits. From constructing your own simple 8-bit computer to creating and debugging applications, the author explores the art of digital electronics through step-by-step instructions and demonstrations of project-assembly techniques.

The Audiophile's Project Sourcebook

by G. Randy Slone
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800-2MCGRAW
www.books.mcgraw-hill.com
$29.95

The clear, illustrated schematics and instructions provided in this book allow audio enthusiasts to build high-quality, high-power electronic audio components and testing equipment. The author gives easily comprehensible explanations of the electronics at work, as well as a practical foundation needed for experimentation and modification of existing audio equipment. Other projects include voltage amplifiers, balanced input driver/receiver circuits, graphic equalizers, and effects circuits.

Robots, Androids, And Animatrons, Second Edition

by John Iovine
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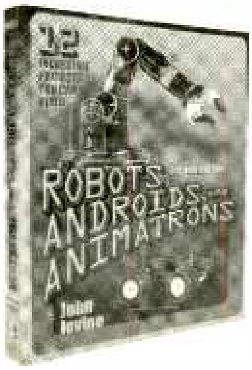
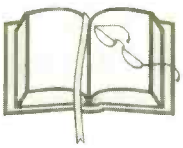


Build your own walking, talking, thinking robot with the projects covered in this book on amateur robotics. Providing you with the building blocks of electronics and motion control, the book enables you to construct a robotic arm that responds to your spoken command, put together basic modules to create sophisticated robot designs of your own, and more. First-time robot builders and advanced hobbyists can complete these projects without programming or assembly language skills.

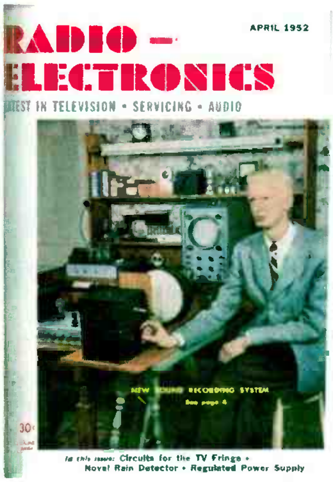


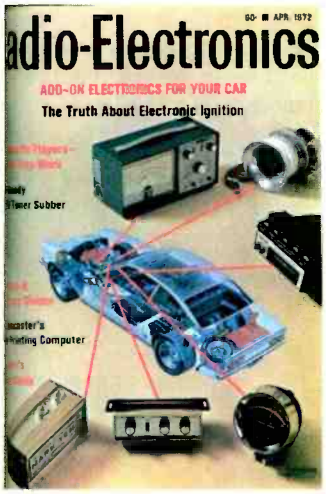
YESTERDAY'S NEWS

A PEEK INTO THE GERNSBACK ARCHIVES

Dateline: April 1952 (50 years ago)

In this issue, a **Radio-Electronics** editorial on collision-proof cars begins to explore the possibility of electronically-controlled cars. Brakes programmed to activate when a car comes within two or three feet of another object would be installed on the front fender, therefore limiting collisions. In the "Theory and Engineering" section, Mohammed U. Fips humorously shows how sound can be neutralized by a dead-beat heterodyne. Readers also learn how to make a rain detector that sounds an alarm with a single drop and how to construct a voltage-regulated power supply.





Dateline: April 1972 (30 years ago)

Summer months usually mean more time in the car. In this issue, **Radio-Electronics** gears up readers with add-on electronics for a more comfortable ride. Articles explain how to soup-up your car in time for vacation with ignition systems, RPM limiters, Dwell stretchers, or cassette players. For those who prefer to stay indoors during the hot months, other articles explore the difference between amplitude and tilt controls for the television, how to tell if the tuner is bad, or a way to develop a new surround sound system, from any direction, using omnisonics.

Dateline: April 1992 (10 years ago)

This issue of **Popular Electronics** is devoted to improving the quality of at-home technology, without spending a fortune. For $25 or less, readers learn how to construct an enlarging light-meter for more professional darkroom print developing. The quality of low-budget audio projects is enriched with bass and treble booster controls, and guidelines are presented for choosing the best all-around audio equipment. In addition, combining an agitator with an imbalanced motor and a heat lamp makes it easier and quicker to etch printed circuit boards.

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Generating A Pulse

Expanding on its already extensive Model 500 series of digital delay/pulse generators, BNC has added the *555 4-Channel Digital Delay Generator* ($2270) to the list. The 555 Generator provides pulses of 2, 4, or 8 with a 1-ns resolution. Each output can be individually adjusted by programming the controls from the font panel or via the GPIB or RS232 interface. Other adjustments, such as setting the delay from 0–100 seconds, are made this way, too.

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Hand-Held Radiation Detector

Taking a versatile and durable hand-held radiation monitor into the field is essential for measuring alpha, beta, and gamma rays. The *Gamma-Scout Radiation Detector* ($330) measures all three at 4-, .2-, and .02-MeV, respectively. Field applications and data logging are simplified with the on-board memory and serial port, along with an extra-large, easy-to-read LCD display mounted on the face of the Novodour housing. The Gamma-Scout also features a Geiger-Muller tube detector and comes with an ultra-long-life 10-year battery.

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Illuminating Measurements

AEMC introduces two new lightmeters, *Models CA811* ($119) and *CA813* ($165), that measure illumination on four ranges in either footcandles or lux, from .1–20 kfc/klux. The CA813 also features a fifth range of 200 klux for higher sensitivity and responds better to common light sources. The two meters have a removable, optical sensor designed to match the response of the human eye. They include a 3½-digit back-lit LCD, as well as PEAK, HOLD, and MAX functions.

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CIRCLE 62 ON FREE INFORMATION CARD

Then There Was Color

It took 25 years for color to be added to televisions to enhance the viewer's experience. It took only two years after the launch of the ScopeMeter 190 Series of handheld oscilloscopes for Fluke to add two full on-screen color test tools. The *196C* (MSRP $2695—without software) and *199C* (MSRP $2995—without software) help make identification and differentiation of individual waveforms considerably easier while maintaining and improving the capabilities previously featured within the series, from a faster update rate to a new triggering mode.

FLUKE CORP.
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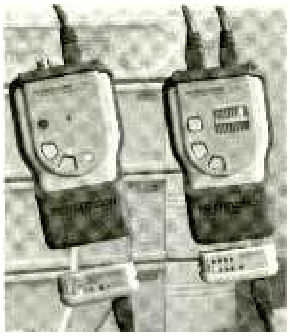
Network Cable Testers



The *Model 230A Multi-Network Cable Tester* ($69) and the *Model 231A Deluxe Multi-Network Cable Tester* ($79) are portable, lightweight, and battery-powered. They can be used for testing cables such as 10Base T, 100Base Tx, 356A, Token Ring, and more. Both models feature a protective rubber boot, belt clip, and a built-in remote terminator-storage compartment. The accompanying remote unit allows the user to test installed cable either from the wall plate or patch panel.

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www.bkprecision.com
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High-Temp Wire Connectors

Designed for applications in high-temperature conditions up to 150° C (302° F), these *Hi-Temp Wire Connectors* (from $5.50–$10.50 per bag of 100) are fire-retardant and heat-resistant. The high-dielectric, thermoplastic shell provides superior flash-over protection and prevents exposure of bare wire. Available in four sizes, these connectors are perfect for HVAC, automotive, consumer, electrical, and industrial applications.

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800-624-4320
www.gardnerbender.com
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Sound-Off

A two-scale, direct-reading decibel meter allows the *Sound Level Meter* (#30387-32) ($160) to be used in home, at school, or for industry. The low-scale indication ranges from 40–80 dB, while the high scale ranges from 80–120 dB. This lightweight and compact test tool features a battery check and calibration settings, along with a 1- × 2-inch window.

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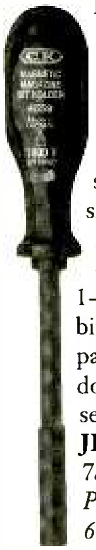
CIRCLE 66 ON FREE INFORMATION CARD

AC Multitester

The open-jaw clamp-on feature of *Model 38393 AC Multitester* ($79) enables the user to test one wire after another in a circuit box or control panel without opening and closing the jaws. It measures AC current to 200 A, resistance, frequency, capacitance, and duty cycle. Unique twin LCDs (2000-count ammeter and 4000-count multimeter) display AC current and test-lead function simultaneously. Other specs include data hold, continuity beeper, diode, and relative for non-current function.

EXTECH INSTRUMENTS
285 Bear Hill Road
Waltham, MA 02451-1064
781-890-7440
www.extech.com
CIRCLE 68 ON FREE INFORMATION CARD

Bit Driver



Featuring an extra-strong magnet for safe bit retention, this ¼-inch hex *Bit Driver* ($25) meets safety standards and has been tested for use up to 1000 V. The tool comes with six ¼-inch hex bits—one 0.31 slotted, one 0.47 slotted, two Phillips #1, and two Phillips #2. It may be used with most 1-inch long ¼-inch hex drive bits, and the six-bit storage compartment with the rotating window in the handle allows easy bit selection.

JENSEN TOOLS
7815 S. 46 Street.
Phoenix, AZ 85044-5399
602-453-3169
www.jensentools.com
CIRCLE 69 ON FREE INFORMATION CARD

GIZMO®

For more information go to page 80A

or e-mail: requests@berkshire-is.com

Mobile XM Antenna

XM Satellite Radio provides a huge selection of digital, commercial-free music and talk radio channels. The *TRK-SR1* antenna ($99.95) helps you listen to XM radio in your car. It attaches to a rear or side window using a special acrylic adhesive for a simple, "no-drill" installation. The antenna passes DC power and RF signals through the glass surface to an interior coupler that is then hard-wired to the XM receiver. Everything required for installation is included, as is a protective sleeve for use in car washes.

Terk Technologies Corp., 63 Mall Dr., Commack, NY 11725; 631-543-1900; *www.terk.com.*

CIRCLE 50 ON FREE INFORMATION CARD

Medicine Reminder

How do you keep track of the pills and vitamins you take on a daily basis? If your hit-or-miss method results in more misses than hits, look into the *Automatic Vitamin & Pill Organizer* ($69.95). Delivering the proper dosage at the press of a button, it can be programmed for a week's worth of four doses per day or 28 days of single doses. An alarm clock beeps, a light blinks, and a message flashes on the LCD when a dose is due; and the scheduled pills rotate into position to be released into the handy cup.

The Sharper Image, P.O. Box 7031, San Francisco, CA 94120-9703; 800-344-4444; *www.sharperimage.com.*

CIRCLE 52 ON FREE INFORMATION CARD

In-Wall Speakers

Get room-filling sound without filling the room with large speakers, with the *CAS Series Model 3.1* in-wall loudspeaker ($1500 each). The Baffle Isolation System prevents the speaker from transferring vibrations to the surrounding wall, reducing resonance and providing superior clarity. The three-way speaker uses Ceramic Metal Matrix Diaphragm technology in its 9-inch woofer, 3½-inch midrange, and 1-inch tweeter. This technology is said to deliver unmatched clarity and tonal accuracy throughout its frequency range. This easy-to install unit's Listening Window Selector lets you tailor its performance for smooth frequency response throughout the listening area.

Infinity Systems, Inc., 250 Crossways Park Dr., Woodbury, NY 11797; 800-553-3332; *www.infinitysystems.com.*

CIRCLE 51 ON FREE INFORMATION CARD

Hands-Free Car Talk

There are no tangled cords with the *EarBoom Winder* ($34.95), compatible with any mobile phone with 2.5mm jacks and with Nokia 8000/3000 series phones. It lets you talk hands-free and then retract the cord and stow the EarBoom at the touch of a button. The device can be clipped to a belt, purse, or pocket to keep it in easy reach. It includes six EarGels—a pair each in small, medium, and large. EarGels fit comfortably inside the ear, boosting and channeling sound directly into your ear canal.

JABRA Corporation, 9171 Towne Center Dr., #500, San Diego, CA 92122; 800-327-2230 or 858-622-9955; *www.jabra.com.*

CIRCLE 53 ON FREE INFORMATION CARD

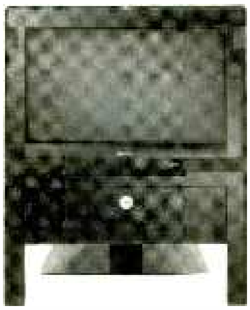
Progressive-Scan Video Processor

Designed for use with 31.5-kHz display devices, progressive-scan monitors/receivers, flat-panel display systems, DTV monitors, and front- or rear-projection systems, the *TB-6001 TrueScan Progressive Scan Display Interface* ($800) accepts any NTSC S-video, composite-video, or component-video source. With reversed 3-2 pull-down processing for any film source, the device corrects for the different frame rates used in film and video for performance that is free of motion artifacts, jagged edges, and redundant or wrong fields. Special 2-2 pull-down processing offers crisp video images, and 4:4:4 video-processing technology doubles the horizontal resolution for greater picture detail.

Proton U.S.A., 13855 Struikman Rd., Cerritos, CA 90703-1031; 562-404-2222; *www.proton-usa.com.*

CIRCLE 54 ON FREE INFORMATION CARD

HDTV Monitor



The handsome *34PW9847* 34-inch direct-view HDTV monitor ($4499) has a black high-gloss finish and features a matching stand with an integrated analog clock. Its flat picture tube creates a distortion-free, crisp image. Digital Natural Motion, progressive scan, line doubling, and Active Control features enhance the image; and the Pronto universal touchscreen remote rounds out the home-theater experience.

Philips Consumer Electronics; 64 Perimeter Center East, Atlanta, GA 30346; 770-821-2400; *www.philips.com.*

CIRCLE 55 ON FREE INFORMATION CARD

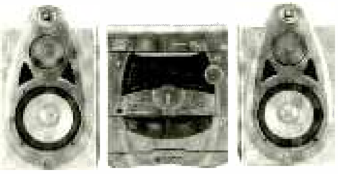
Powered Up

Providing big sound in small spaces, the *RL-28W* ($499) powered subwoofer features unique, stacked dual 8-inch woofers in a slim-profile cabinet. Powered by a robust 200-watt rms discrete amplifier, the subwoofer delivers dramatic bass response measured from 35 to 120 Hz (±2 dB). It offers continuously variable output and crossover controls, allowing its sound to be precisely matched to other components.

Cerwin-Vega, 555 East Easy St., Simi Valley, CA 93065-1805; 805-584-9332; *www.cerwin-vega.com.*

CIRCLE 57 ON FREE INFORMATION CARD

Big-Sounding Mini-System



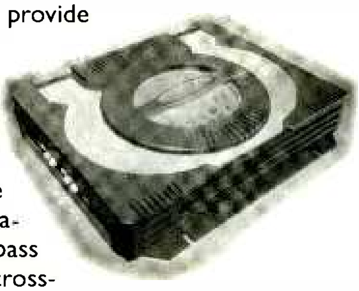
The *Soundgear SG-3030* high-performance mini-system ($399) is equipped with a three-disc CD changer and a full-logic dual-well cassette deck. The distinctively styled system boasts 200 watts of power and three-way loudspeakers. Patented VMAx digital signal processing produces realistic, three-dimensional surround-sound audio using just two speakers. The system includes an AM/FM tuner, clock with sleep timer and dual wake-up alarms, and three-position EQ and Bass Boost controls.

JBL, Inc.; 250 Crossways Park Drive, Woodbury, NY 11797; 800-336-4525 or 516-496-3400; *www.jbl.com.*

CIRCLE 56 ON FREE INFORMATION CARD

Mobile Amp

Get your car rocking with the *XA4300* ($229.95) four-channel mobile amplifier, which provides 100 watts × 2 and 50 watts × 2 into a 4-ohm load (150 watts × 2 and 75 watts × 2 into 2 ohms). The amp can be bridged to provide 300 watts to one channel, while still providing 50 watts × 2 rms—ideal for powering both subwoofers and satellites from the same amp. Other features include a remote bass control, a selectable crossover, and variable bass boost.

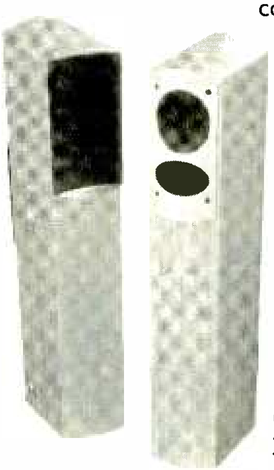


JENSEN Car Audio, 2950 Lake Emma Rd, Lake Mary, FL 32756; 407-333-8900; *www.jensenaudio.com.*

CIRCLE 58 ON FREE INFORMATION CARD

Taking the Floor

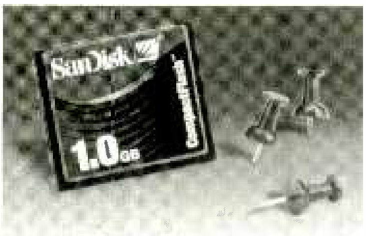
Bose might be known for tiny, inconspicuous speakers and components, but it's no slouch when it comes to floor-standing speakers, either. The *701 Series II* ($998) speaker system features patented Direct/Reflecting speaker technology for balanced stereo sound. The speakers deliver deep, powerful bass without the port noise or compression often found with conventional speakers, and dedicated amplification gives low frequencies even more impact. The 701 is compatible with amplifiers up to 300 watts per channel, rated 4 to 8 ohms.



Bose Corporation, The Mountain, Framingham, MA 01701-9168; 800-444-BOSE; *www.bose.com.*

CIRCLE 59 ON FREE INFORMATION CARD

1-GB CompactFlash Card



The world's highest capacity standard CF Type I CompactFlash card to date, with an amazing 1-gigabyte of memory, is able to store more than 1000 digital images, more than 20 hours of digital music, or several hours of video. The *1-gigabyte CompactFlash Card* can be used in digital cameras, music players, and other portable electronic devices. Priced at "less than $800," you might expect it to come with one or more of those items, but huge storage capacity doesn't come cheap!

SanDisk Corporation; 408-542-0500; *www.sandisk.com*.

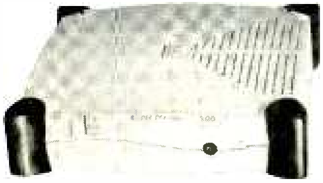
PC Phone Home

The *Maestro Pocket PC* ($649) connects easily with an Audiovox CM-9100 cell to provide complete Internet access without the need for an add-on modem or an additional wireless ISP. The small, lightweight unit features both 32 MB of SDRAM and 32 MB Flash ROM, as well as built-in CompactFlash and SD card slots. It's equipped with an Intel Strong ARM 206-MHz processor and Windows-powered *Pocket PC 2002* software Packaged with the cell phone, Maestro is being offered through wireless carriers.

Audiovox Corporation; 800-229-1235; *www.audiovox.com*.

Compact Power Protection

Aimed at SoHo computer systems, the *Ellipse Premium* uninterrupted power supplies (UPS)(starting at $220) are only three inches deep, yet pack enough battery power to keep a Windows NT server running for an hour (depending on configuration). An advanced voltage regulator allows the UPS to ride through deviations in input voltage without discharging the battery during momentary brownouts. The 650, 800, and 1200-VA models each include *Solution-Pac* power-management software for Windows 95/98/2000, NT Novell Netware, SCO Unix v.3.0 and Openserver 5.0, and Linux.



MGE UPS Systems; 800-523-0142; *www.mgeups.com*.

Jack of All Trades

Combining the most often used office equipment into one space-saving unit, the *KX-FLM551* ($419.95) serves as a plain-paper fax, a copier, a PC scanner, a telephone, and a 10-page-per-minute 600-dpi laser printer. The fax portion, with 14.4-kbps modem, has a 100-station auto dialer for sequential broadcasting. The scanner includes *OCR-Read-Iris 5.5 PRO* software, which recognizes text in up to 55 different languages.

Panasonic Consumer Electronics Company; 201-348-7000; *www.panasonic.com*.

Home Networker

Home computer users can now access the Internet from two different computers at the same time without running any cables, using the *Hewlett Packard/RCA H950 SystemLink* ($249.95) and existing electrical wires and outlets. The external USB-to-powerline network adapter allows shared Internet access, remote printing, multi-user game playing, and transferring and sharing files. It sends digital signals over existing wires at rates of up to 2Mbps. The expandable system can handle up to 20 computers with add-on SystemLink nodes. The basic package includes two plug-in nodes, two parallel cables, two USB cables, and software.

Thomson Consumer Electronics; 317-587-4450; *www.rca.com*.

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