

BIOSPHERE II: LIVING IN AN ARTIFICIAL WORLD

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Popular Science

**SPECIAL
ELECTRONICS
SECTION**

DIGITAL SIGHT & SOUND HIT HOME

**WHAT'S
NEXT IN
HOME
ENERGY**

**EXCLUSIVE
PREVIEW:
GM'S ALL-NEW
SATURN**



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THE DIGITAL AGE COMES HOME

STAY TUNED FOR SMART TV

When President Bush quipped in a speech that "By the year 2000 all Americans must be able to set the clocks on their VCRs," the implication was that we're a nation of electronic illiterates. But for those who reside in homes where "12:00" flashes endlessly, the difficulty of programming a VCR is no joke.

Even choosing a program to watch on the spot isn't easy. With 60 percent of the country's viewers linked to cable TV, the typical household now pulls in 40 or 50 channels. Fiber-optic trunks planned for the '90s might add another 100 channels, bewildering consumers who are already suffering from a condition that some industry experts call "channelization."

TV program guides aren't much help. Program listings have taken on the look of an office spread sheet, and bleary-eyed viewers discover that the numbers in regional guides often bear only passing resemblance to the channel configuration in their local system.

Aware that the video explosion is overwhelming consumers, TV and VCR makers are working on models that will help viewers cope with the glut of programs. Nicholas Negroponte, director of the Media Laboratory at the Massachusetts Institute of Technology, predicts that future televisions will "do some of the watching for you." They'll scan TV listings, "learn" your tastes, select programs you'd be interested in, and keep track of what you actually watch.

How will the idiot box get so smart? It will require nothing less than an electronic brain transplant—giving TVs some of the digital processing capabilities now found in personal computers. "Televisions and computers will

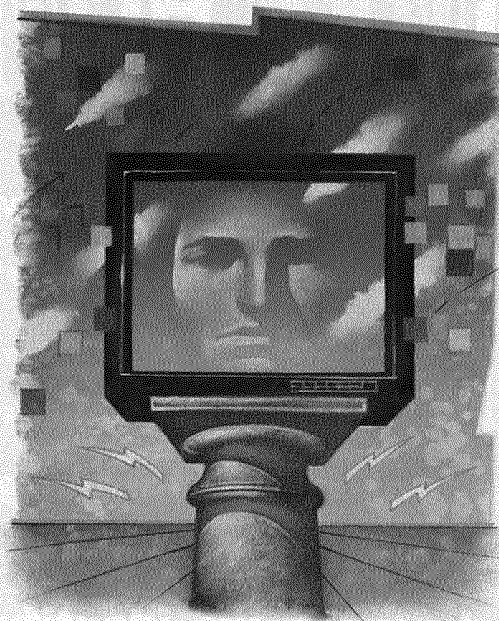
come together in the next generation of TV sets," says Dr. Hiroyuki Mizuno, executive vice president in charge of research and development for Matsushita Electric Industrial Co., Ltd., the Japanese electronics giant that sells products under such brand names as Panasonic.

Microprocessors in TVs already enhance picture quality. That's why owners of late-model sets rarely need to fiddle with color hues and other adjustments. But tomorrow's sets will be equipped with additional processors and memory chips that will help viewers "manage" their TV-watching time.

"Very shortly TVs are going to have more processing power than the microprocessor did when it first came out," declares Dr. Ernest Kent, director of the Information Sciences Research Sector at Philips Laboratories in Briarcliff Manor, N.Y. "This year's or next year's sets would be able to run BASIC if you put it in there."

Scientists working on experimental systems hope that computer-generated displays and automated functions will improve television's "human interface"—in other words, make TVs easier to use. These TVs *won't* have remote-control units that look like expensive calculators.

Matsushita is already testing a voice recognition interface that would allow you to change the channel on a TV, or program a VCR, by speaking into a wireless microphone. Owners could operate a television with "not many words," Mizuno says, because commands like "up" could be paired with "channel" or "volume." As for a VCR, Mizuno expects you'd merely have to announce the channel, day, and time, and say "make record" to have the machine do your bidding. Voice-controlled TVs are still too expensive for a mass consumer



**Too many channels
and too little time?
Future TVs will do
some of the watching
for you.**

By MICHAEL ANTONOFF

market, he says, but it may be only a matter of a few years before such technology migrates from laboratory to living room.

Another "user-friendly" interface (TV and computer manufacturers even use the same jargon now) under development in the laboratory features on-screen graphics resembling Apple Computer's Macintosh icons (see photo). You move the icons around on the screen using a penlike infrared pointer. To record a program, you might move the hand icon to an on-screen TV listing, "grab" the listing, and slide it over to the VCR icon. That's just one of the entertainment and home environment controls that Frox, Inc., a start-up company in Sunnyvale, Calif., has in mind for its yet-to-be announced command system. The TV-computer hybrid would also watch for commercials and skip them when taping shows. It would catalog and play CDs, displaying the cover art and liner notes on the TV screen. And it might even monitor electronic data bases for items of interest to the owner.

Frox's president, Austin Vanchieri, says that smart TV is an ingenious way to manipulate everything electronic in the home. "Today we rely on the microprocessor between our ears to find our CDs, locate the misplaced TV schedule, and go through the exhaustive list of cable stations. Smart TV is the way to access that world," he says.

The Frox box connected to a TV set would contain a Sparc processor or its equivalent, and four to eight megabytes of memory, making it as powerful as a Sun Microsystems work station. Vanchieri doesn't expect to launch the system before July 1991. Priced at around \$10,000, it won't have a mass appeal.

Frox is hardly alone in its pursuit of an ultimate box that combines the friendliness of a traditional TV set with the control and retrieval options of a computer. At least one company is already selling television sets that claim "artificial intelligence."

Four models in JVC's 1990 line of color televisions, ranging in size from 27 to 35 inches, monitor household viewing habits. When you turn on one of these sets, an on-screen display lists the three channels most frequently watched during the day (4 a.m. to 6 p.m.) and evening (6 p.m. to 4 a.m.). The two largest sets display pictures from those channels in three windows, so you can decide in a glance which of your favorites is the fairest of all (see photo). Al Levene, JVC's national sales and marketing manager for color TVs, says the next generation of sets will break the viewing day into smaller time periods.

Prices for JVC's sets range from \$950 to more than \$2,000. The TVs also automatically set the volume for day and evening viewing according to the average levels they have measured.

These sets are heuristic, or self-educating. They constantly update their on-screen menus to reflect the latest data on channel usage. Some viewers find that disorienting. Also, individual family members with radically different viewing habits aren't served by a TV set that has no way of knowing who is watching.

Ideally, a television would be able to keep track of individual viewers' program preferences, as well as their favorite channels. An intelligent TV would know what toppings its couch potatoes crave, and would season the menu accordingly.

How will you tell your TV about your tastes? "If you like what you're watching, you'll be able to press one button on the remote, and the TV will record the show the next time it's on," says Dr. Mark Rochkind, president of Philips Laboratories. You might even program the TV to sound an alarm five minutes before the show begins, he says. If the

reminder went unheeded, the TV would proceed to record the program.

Rochkind envisions an even smarter set that would compare program descriptions with a viewer's profile. You could instruct the set to tell you about any programs with a 70 percent match, for example. "Profiles might change," explains Rochkind. "Today I might be interested in sports or only in baseball. The key thing is how consumers are going to express their preferences so that agents in the system can operate in their behalf."

Creating a viewer profile for a computer inside your TV isn't easy. "The computer has to get to know you," says Andrew B. Lippman, associate director of MIT's Media Laboratory, "and it's real hard to distill somebody down to fourteen or fifteen words."

AUTOMATIC VCR PROGRAMMING

Television and VCR manufacturers agree that as few as one in five people are able to press the appropriate sequence of buttons to tape a show when they're not home. Most of the nation's more than 63 million VCR-equipped households use their machines for one function: playing prerecorded tapes.

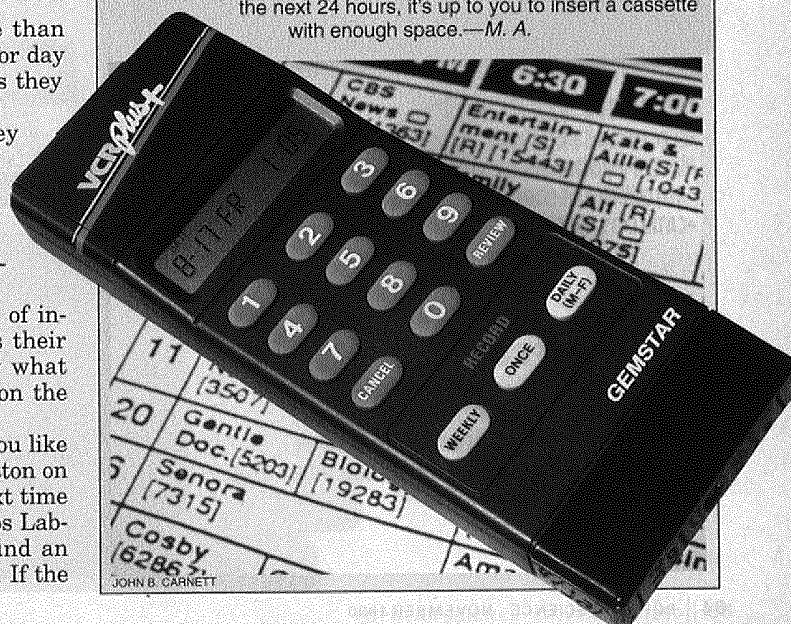
In an NBC survey, two-thirds of 125 VCR operators asked to program their machines to record "Late Night with David Letterman" either gave up or screwed up.

Help is on the way—in the form of a hand-held device called VCR Plus+ that could make programming your VCR as simple as dialing a phone number. Instead of using the VCR's timer to tape a program, you punch in a four- to seven-digit number on the telephonelike key pad. VCR Plus+ has its own clock, memory, and LED display. When it's show time, the infrared device turns on the VCR, selects the channel, and records the program. When the program is over, it turns off the VCR. Made by Gemstar Development Corp. of Monterey Park, Calif., the \$60 gadget contains a 14-event timer.

Users consult the TV listings of cooperating newspapers or magazines for program codes. The *New York Times*, *Los Angeles Times*, *San Francisco Chronicle*, and certain regional editions of *TV Guide*, among others, plan to add the VCR Plus+ numbers to their listings. There is no subscription charge.

According to Louise J. Wannier, vice president of marketing and business development for Gemstar, VCR Plus+ will be introduced in time for Christmas in major cities and available nationally in 1991. "It's a one-step solution to programming your VCR," she says.

VCR Plus+ works with most VCRs and cable TV boxes, but users must first configure the device to their systems. Though VCR Plus+ calculates how much tape you'll need for the next 24 hours, it's up to you to insert a cassette with enough space.—M. A.



Characterizing a TV program is less difficult. A committee of engineers representing consumer electronics manufacturers, cable operators, and broadcasters is attempting to forge a technical standard for transmitting information about program schedules and possibly even subject matter. Once a standard has been adopted, manufacturers will be able to build televisions and VCRs capable of decoding the information.

The Engineering Committee for Program Identification is considering a number of methods for transmitting electronic program guides. Currently, most television viewers get program schedules from a printed guide or a dedicated cable channel. Both are difficult to read. Walter Ciciora, a member of the industry committee and vice president of technology at American Television and Communications (ATC) in Stamford, Conn., a Time Warner subsidiary that owns cable systems, says that video guides "take too long to scroll to the part of the guide covering the time of interest. When the guide finally gets there, the text goes by too fast to read." Video guides contain even less detail than printed guides, Ciciora com-

plains. "It's simply inadequate to decide what to watch."

Ciciora favors creating what he calls "mood guides," categorizing programs under headings such as romance and adventure. You'd select a mood, then choose from a list of programs generated on the screen.

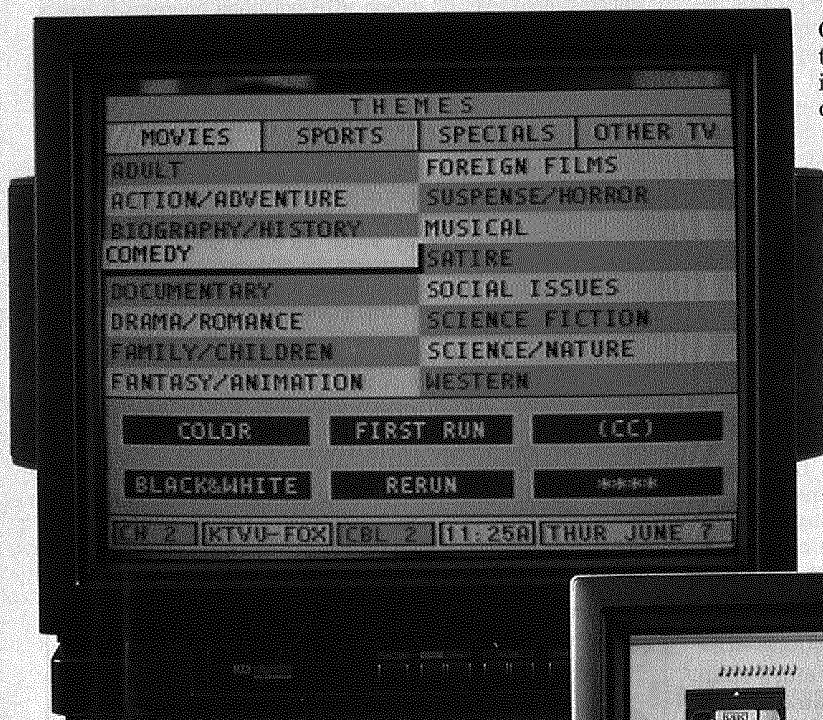
A similar proposal is to identify shows by categories, such as sports, comedy, and news. A viewer could push a button to select all the comedy on at the present time, for example.

Several companies are already developing electronic program guides. Since 1986, viewers who receive programming through their own satellite dishes have had access to a subscription service called SuperGuide (see photo). Based in Shelby, N.C., SuperGuide enables people to tune in a show not by satellite and transponder but by program title. To watch a movie on Showtime West, you don't have to tune in the pay channel's satellite feed to the western United States. Instead, you simply punch in the movie selection using SuperGuide's six-button remote control. You can also call up a brief text description of the film.

According to Peter Hallenbeck, SuperGuide's chief design engineer, the system automatically updates the listings each morning, storing up to 12 days of schedules for 60 channels. That amounts to about 1.8 megabytes of raw data, but SuperGuide uses a compression scheme that squeezes the information into a box with 256 kilobytes of memory.

Proponents of SuperGuide want to extend the service to cable systems, transmitting the data to sophisticated receivers that would replace the cable boxes now used in subscribers' homes. Hallenbeck suggests that cable viewers would be willing to pay an additional \$36 a year for the convenience of SuperGuide.

Hallenbeck claims that SuperGuide has a patent on "a downloadable guide and viewer interface," but a competing company,



INSIGHT TELECAST

- ELECTRONIC PROGRAM GUIDE
- SELECT PROGRAMS BY TITLE/SUBJECT
- AUTOMATIC RECORDING
- CATALOGS VIDEOTAPES

FROX

- TV-COMPUTER HYBRID
- MACINTOSH-STYLE ICONS
- INFRARED REMOTE POINTER
- CONTROLS AUDIO AND VIDEO GEAR



InSight Telecast of Palo Alto, Calif., claims to hold a patent for using an on-screen program guide to control any storage device such as a VCR. It's unclear at this point who, if anyone, owns the technology.

InSight was expected to announce this September an agreement with PBS to use part of the vertical blanking interval (VBI) in the signal of PBS member stations to carry an encoded program guide for all channels. Sandwiched between picture frames, the VBI is already used by networks to signal affiliates and for closed captioning for the deaf.

According to Bob Burroughs, manager for Panasonic Technologies, in Secaucus, N.J., and chairman of the Engineering Committee for Program Identification, a portion of the VBI is likely to be chosen to carry program-guide data. Burroughs says that the data could be in the form of ASCII text, a digital standard used in the computer world.

In West Germany, some VCRs already take cues from program information that broadcasters deliver via a particular VBI line in television transmissions. Burroughs explains that if a German soccer fan wanted to record a match starting at noon, but the match was delayed, the VCR wouldn't start recording until it detected the sports program's unique code in the VBI.

Developing a similar standard in the United States will be a "two- to five-year process," says ATC's Walter Ciciora. Michael Faber, president and chief executive officer of InSight Telecast, estimates that it will be at least a year before his service reaches subscribers. Consumers will need a VCR adapter, which will cost about \$100, to use InSight. Eventually, special decoders could be built into TV sets, VCRs, and cable boxes.

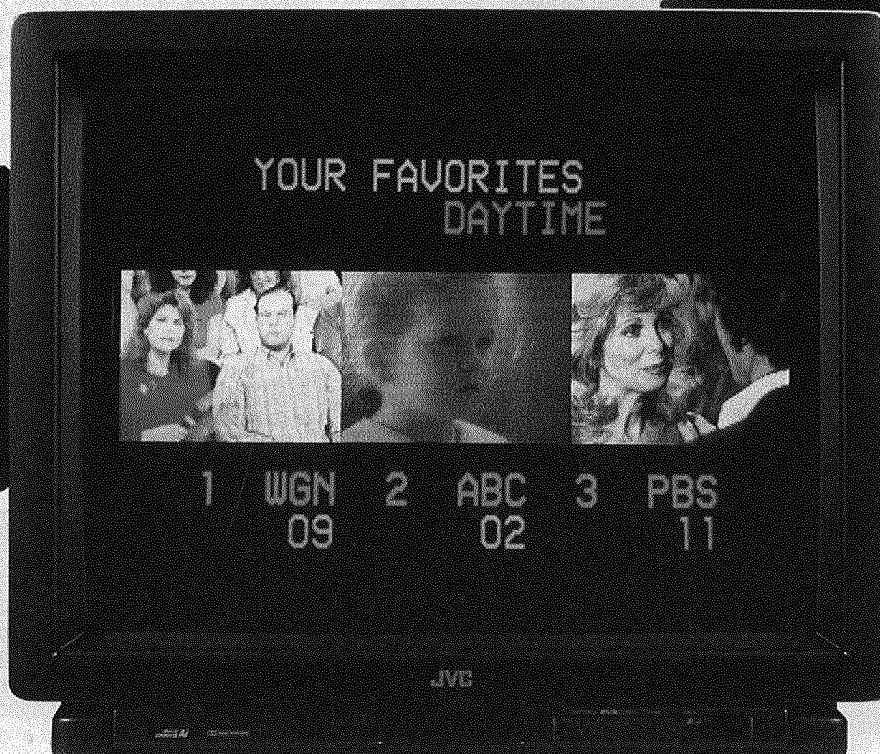
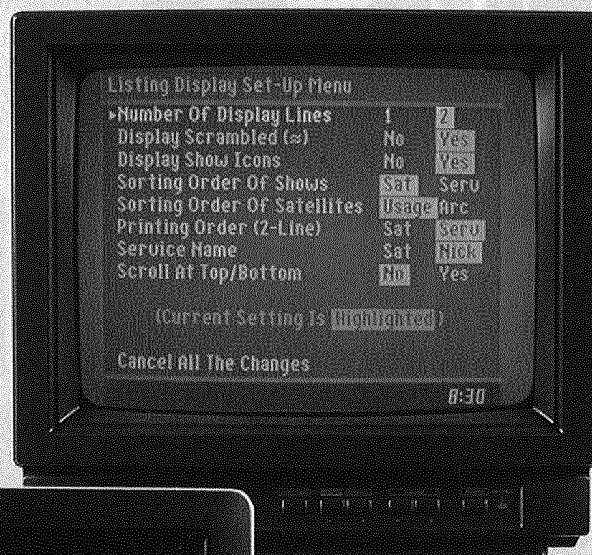
InSight has lined up some powerful partners. In addition to PBS, they include: TV Host/TV Listing, a cable guide publisher, to provide electronic listings; Sumitomo Corp., a Japanese trading company, to establish a consortium of InSight-licensed VCR manufac-

turers; and Spelling Entertainment, to provide capital and marketing.

In a demonstration at InSight's offices in Palo Alto, Calif., Faber showed how consumers will be able to select programs to view or tape by subject and title rather than by channel (see photo). You move a highlight bar over the program title to make a selection. A link command lets you specify five consecutive episodes of a soap opera, for example. The InSight guide will be updated daily and cover eight days. It's possible that the guide will even include local theater and entertainment listings.

InSight's system puts a code on each recorded program so that users will be able to archive and retrieve tapes without having to scan them. The system also automatically generates an on-screen table of contents for each tape. People frustrated by their inability to find shows quickly in their burgeoning tape libraries will appreciate this automation.

An InSight-equipped VCR also nullifies President Bush's goal for the year 2000. When the VCR downloads data in the VBI signal, it can reset its own timer. **ES**



SUPERGUIDE

- SATELLITE SUBSCRIPTION SERVICE
- LISTINGS UPDATED DAILY
- SELECT PROGRAMS BY TITLE
- CALL UP PROGRAM DESCRIPTIONS

JVC

- "ARTIFICIAL INTELLIGENCE" TV
- MONITORS HOUSEHOLD VIEWING
- DISPLAYS FAVORITE CHANNELS
- SETS VOLUME AUTOMATICALLY