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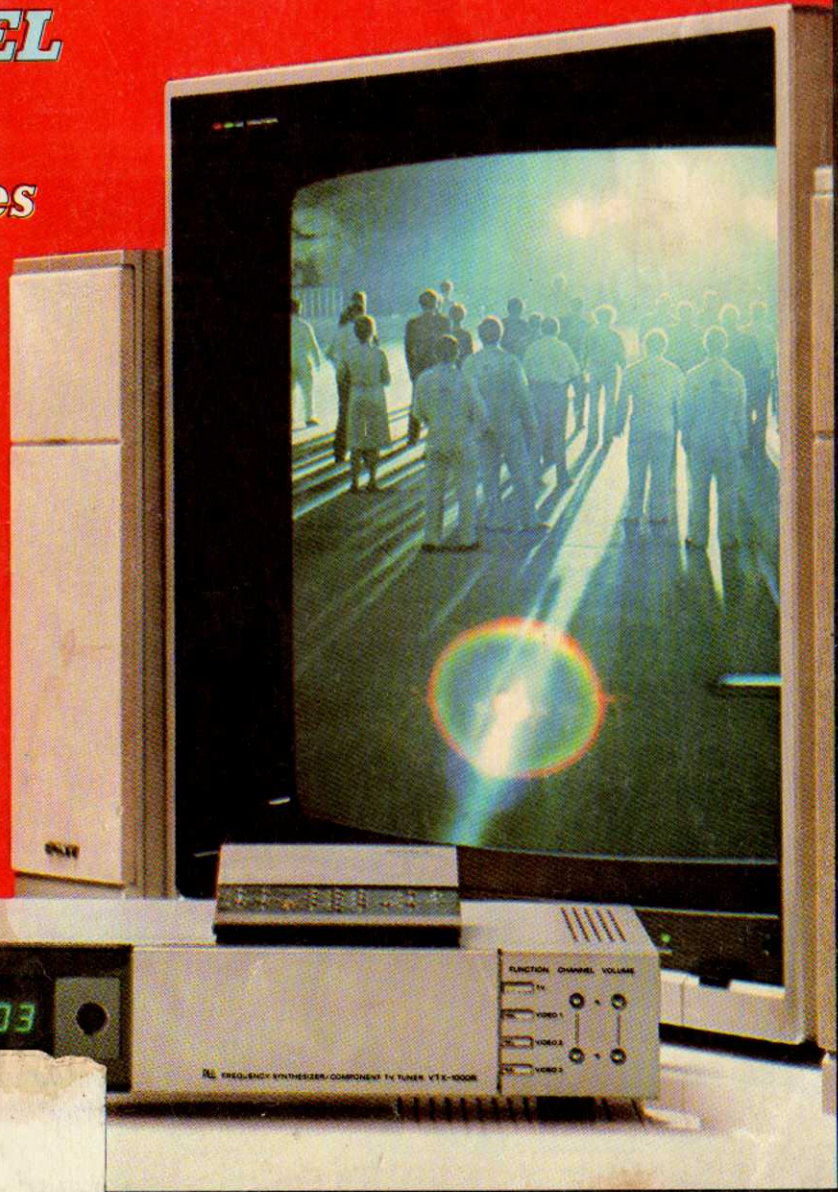
COMPONENT VIDEO EXCLUSIVE: FIRST LAB TESTS OF SONY'S PROFEEL

Watch Out for Counterfeit Games

Building the Ultimate System

Micro Video: What's Here - What's Hype

*Taping Tricks
By Milos Forman*



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Review®

42



56



44



10

SPECIAL REPORT

Invasion of the Counterfeit Games By Frank Lovece. Video-game piracy is growing as fast as the popularity of video games themselves, creating serious problems. A groundbreaking investigation of this illegal activity..... 44

FEATURES

The Ultimate Video System By Marc Wielage. If you were handed a million dollars to spend on the video equipment of your dreams, what would you choose? Here are an expert's ideas..... 40

Micro Video: What's Here—What's Hype By Robert Gerson. The quarter-inch tape boom is just around the corner. In fact, it's been just around the corner for 20 years now. An inside view of the history—and the future—of tiny tapes..... 42

Careers in Video—A Graduation Day Primer By James Link. Just as "plastics" was the field for one generation, video's the way to go now. Timely interviews with top video pros..... 48

Olivier at 75 By Andrew Sarris. A special tribute to the screen legend, who began brilliantly and keeps getting better..... 54

How Movies Are Remade for Video By Ed Hulse and Mark Trost. More and more movies are being remade for different video formats, perplexing serious collectors..... 56

CONTINUING SERIES

Direct It: Milos Forman Tells You How Videotaping tips from the director of *Ragtime* and *Hair*..... 63

Critic's Choice: Capra-Corn By Leonard Maltin. A fond look at the most collectible movies of one of America's most beloved directors, as he celebrates his 85th Birthday..... 66

EQUIPMENT REVIEWS

Test Reports The CBS Technology Center and technical editor Leonard Feldman report on their in-depth lab tests of: **Sony Profeel Component Video System** First comprehensive report on the KX-2501 video monitor and VTX-1000R tuner. Plus the Sony Profeel speakers, models SS-X1A and SS-X10A, designed for use with the monitor and tuner..... 18
Hitachi Color Videocamera The model VK-C800, with a Saticon tube and automatic focusing..... 25
Toshiba Tabletop VCR The Beta-format model V-8500, with playback special effects..... 35

FEATURE REVIEWS

Video Picks Feature reviews of new tape and disc releases: Rex Reed on *Mommie Dearest*... Ed Levine on *The Charlie Daniels Band*... Clive Barnes on *The American Dance Machine* and *Purlie Victorious*... Marjorie Rosen on *North by Northwest*... Leonard Maltin on *The Clown*... Roy Hemming on *The Pirate*... Genevieve Kazdin on *The Master Cooking Course*... Robert Angus on *A Thousand Clowns*... Mark Trost on *Mel Brooks' History of the World: Part I*... Pete Coutros on *Fishing USA*... Al Goldstein on *Centerfold Fever*, *Deep Inside Annie Sprinkle* and *Blue Magic*... Plus more reviews *In Brief*..... 73

Coming on TV Capsule reviews of more than 50 tapeable programs scheduled for broadcast and cable TV this month..... 98



40

DEPARTMENTS

Viewpoints From editor David Hajdu..... 5

Newsbreaks Art Levis on late-breaking video news..... 8

Freeze-Frames Carl S. Kaplan's lighthearted potpourri..... 10

Questions Video experts on readers' video problems..... 13

New Products The latest news in video equipment..... 16

Top Tapes Bestsellers on videocassette..... 74

Top Discs Bestsellers on videodisc..... 75

Previews What's due for release on tape and disc..... 96

In The Works A sneak peek at long-range releases..... 97

Games By Phil Wiswell. *Video Barnstorming*..... 109

Video Music By Bruce Pollock. *Rock's video tracks*..... 110

Looking Ahead By Bob Gerson. *What price rental?*..... 112

Backspace By Marilyn Wein. *An easy-to-make tape bag*..... 116

Avon calling with discs, and other flashes



Art Levis

SCOTCH TAPE: Budget-minded owners of VHS-format VCRs are getting break in form of new eight-hour tapes—now available from virtually every blank tape supplier (see New Products, page 16). RCA triggered avalanche with first eight-hour blank, made with extra-thin tape. At presstime, Fuji, JVC, Maxell, Panasonic and TDK had announced intention to sell eight-hour tapes, with other VHS-format tape makers certain to follow. New tapes effectively upgrade all existing six-hour machines to eight-hour status in extended-play mode.

At first glance, eight-hour blanks don't appear to be great bargain, with suggested manufacturer retail prices ranging from roughly \$33 to \$36. That won't last long though, once discount-oriented video stores move into full swing and drive prices down to low-\$20 range.

* * *

TEENY, TEENIER, TEENIEST: Seems there's no end to Japanese determination to do things in little way. Latest news is tiny color TV set with two-inch screen from Matsushita (Panasonic, Quasar in US). Mini set reportedly scheduled for US introduction sometime this spring. No details on prices.

* * *

DISC RISK: RCA has finally caved in on CED-format videodisc player pricing and has lopped "suggested retail" price on original model from \$499 to \$299. Move was based on two factors: sluggish disc player sales and discovery that per-player disc purchases are far higher than earlier expected (22 to 23 in first eight months of player ownership and rising rapidly). New pricing gambit roughly parallels strategy pioneered by Gillette—give razors away, make money on blades. RCA also coming out with new player at \$350, essentially same as first model but with slightly different cosmetics.

* * *

DOOR-TO-DOOR DEAL: Redesigned disc player isn't only RCA involvement with cosmetics. Avon lady could be calling at your house in near future with CED-format discs and players tucked into her cosmetics case. Though neither RCA nor Avon is saying anything publicly, negotiations on deal are known to be under way.

* * *

MORE FUN AND GAMES: Video games have entered frantic new era, with much of latest excitement centering on cartridge compatibility. Following entry into Atari- and Intellivision-compatible cartridge field are Apollo, Coleco, Imagic and others (April '82 VR). Mattel says it'll sell Atari-compatible cartridges this summer. And, in reverse twist, Coleco has introduced new Colecovision game console which will accept Atari or Intellivision cartridges through use of special module adaptor.

* * *

THE EYE HAS IT: Mushrooming consumer video field is spawning yet another programming venture, this one joint effort of CBS and 20th Century-Fox. Effect on operation of 20th-Fox Video (formerly Magnetic Video) or on CBS cable service still unclear, but new partners expect to be active supplying programs for both cassette and cable. Also up in air at presstime: where new deal will eventually leave MGM, currently partner in MGM/CBS Home Video.

* * *

COUNTER REVOLUTION: Next cassette you rent could come with built-in digital counter, designed to keep track of number of times tape is played and rewound. Superscope is getting ready to pitch rental counters to prerecorded cassette companies as way of monitoring "hits and flops," possibly for use in determining royalty fees.

* * *

MORE ON MAVICA: Hard-copy printer called Mavigraph is latest accessory Sony has announced for its revolutionary video still-picture camera, the Mavica (for Magnetic video camera). Device prints three-by-four-inch pictures taken with Mavica or fed from other video sources—VCR, TV tuner, home computer, etc. Picture, or Mavigram, takes about five minutes to develop, costs about 50 cents apiece. Camera and printer together will retail for about \$800 when they go on sale in late '83, according to Sony.

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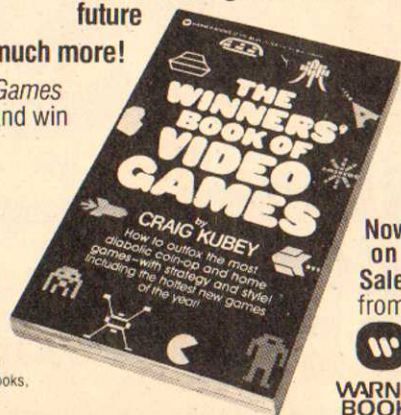
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Fig. 2.

Automatic iris: No way to override though a "normal/backlight" switch does help compensate.

same scene, when the subject has continuous variation of distance from the lens and when the subject has a fine pattern and "equal pitches" between lines. In addition, the auto-focus feature doesn't operate correctly when used under fluorescent lights and, perhaps most discouraging, when the zoom lens is set to the telephoto end of its range. You'll have to admit, that doesn't leave many instances in which this feature does work properly. Even in such circumstances where the auto-focus does work moderately well, we found in actual use that having to press the auto-focus button on the trigger of the handle while worrying about all the other aspects of videotaping can be a bit confusing and frustrating. This feature, along with all the other automatic operations, must surely have added some weight (and some cost) to this camera, which is neither the lightest nor the most inexpensive camera available these days. The shoulder pad supplied with this rather bulky model has all but disappeared from some of today's lighter cameras.

As always, though, there is something of a trade-off here. The basic performance of the Hitachi camera is good to very good, and the Saticon pickup tube is a superior videocamera tube. It's just too bad that Hitachi had to load this camera with one or two features that aren't all that important. If you can ignore these, the basic camera itself is fine. (L.F.)□

Coming Up

Our annual tape tests—the only empirical laboratory measurements of consumer videotapes published anywhere—are coming up soon. The first month's report will concentrate on VHS-format tapes, with the next month's covering Beta- and CVC-format tapes.

Next month, this section will feature reports on: NEC's new video monitor, Sharp's My Video one-piece portable VCR/tuner, Zenith's latest VCR and Winegard's UHF antenna.

THE ULTIMATE

By Marc Wielage

Let's say you're an avid but impecunious video fan. One day, out of nowhere, a man announcing himself as the lawyer for a wealthy eccentric named J.

Beresford Tipton hands you a check for \$1,000,000. Now you can build The Ultimate Video System you've always dreamed of.

Tipton is going to keep an eye on you, though, to see just how well you put this bonanza to use. (Even dreams can be audited.) So, as the drama unfolds, you're overwhelmed by conflicts about which pieces to buy, or even where to begin.

Actually, every person's ultimate system is as different from anyone else's as his or her fingerprints. The variety of equipment and the myriad uses to which you can put it can make the buying process somewhat complicated, but the resulting system can be that much more personalized. Each of the products I've listed here is outstanding for its own reason, though there are, of course, plenty of other excellent pieces of video equipment not mentioned.

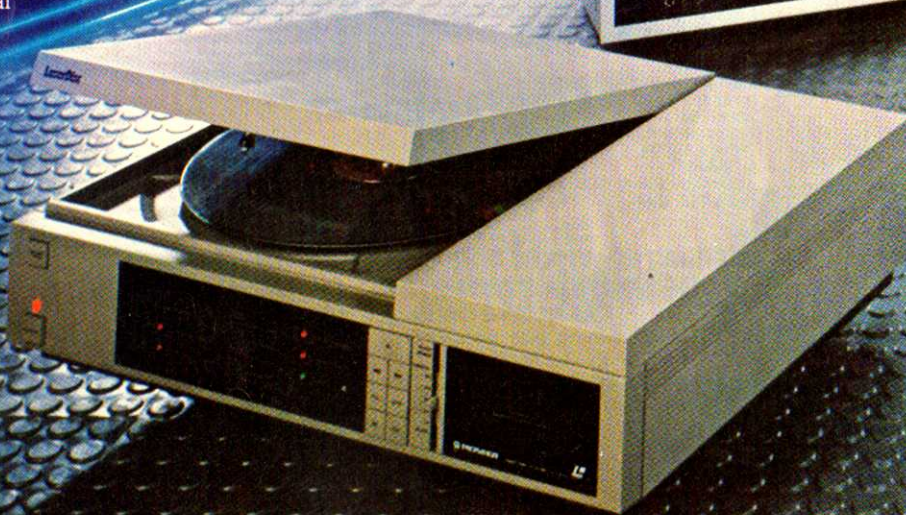
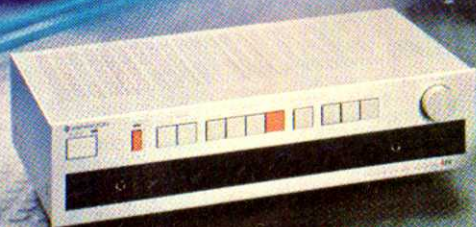
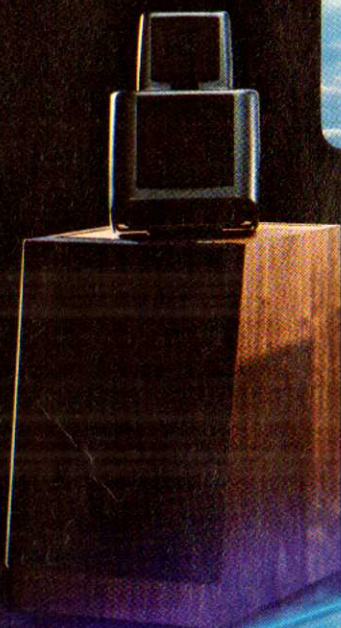
Your first big purchase should be for that very heart of the video system—the screen. There are projection sets, monitors, sets with stereo and more. Which should you get? With a million bucks, why don't you get one of each?

Video Monitor

The next acquisition you should make with your newfound wealth should be a video monitor. Monitors differ from conventional TV sets in a couple of major ways: First, most don't have tuners, one of which you would have to buy as a separate component; second, most have stereo sound. On the average, their screens have much higher resolution than conventional sets. The difference between the way a video game, disc or tape looks on a monitor and on a regular NTSC-standard TV set is remarkable, not only because of the resolution, but also because monitors have direct video inputs. They help cut down the kind of signal loss that takes place when you connect video equipment to a TV set through an RF converter.

Today, the most sophisticated video monitors are made by Sony (see Test Report, page 18), NEC and Teknika. All three companies have monitors with 19-inch and 25-inch (diagonally measured) screens, with NEC also offering a 12-inch size.

There are some unconventional "conventional"



VIDEO SYSTEM

TV sets, too. RCA's cable-ready model GFR-1001 for example, has 127-channel tuning—the most of any TV set. General Electric's model 25EM2870K and Magnavox's model 5260-64-66 are consoles with stereo sound and 25-inch screens—the largest among conventional TV sets, save for Sony's limited edition, handcrafted KV-3000, with a 30-inch screen and a \$10,000 price tag.

Projection TV

For movie extravaganzas, sports and other panoramic programming, a projection TV set is a must. Because of its versatility and high quality, first choice for a projection system must be the Kloss Novabeam One. This front-projection set comes in a couple of different shapes and sizes. You can get the standard model, which projects onto a 6½-foot (diagonally measured) curved screen, or a modified version that will project onto any 10-foot flat surface. You can also get variations of each that mount on the ceiling.

The one drawback of the Novabeam, though, is that it isn't stereo-ready. But there are monaural input and output jacks for the audio portion, so you can channel the sound through a stereo system for a hi-fi effect.

If stereo sound is important to you, though, you should check out the stereo projection TV sets made by Fisher (model PT900), General Electric (Widescreen 4000), Mitsubishi (models VS-515U and VS-520UD) and NEC (model PJ-45EN).

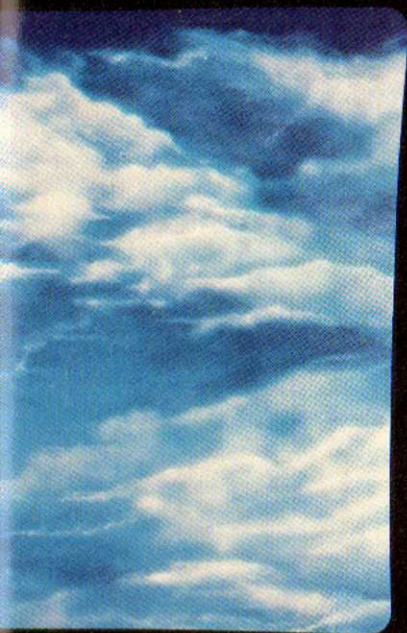
Videocassette Recorder

Since you're only getting the best, you might as well get all the best. For the ultimate system, you need all three VCR formats: Beta, VHS and CVC (quarter-inch), and you need two of each. That way you can edit your own tapes by wiring two recorders together. Plus, you'll have the added convenience of not having to get up to change tapes when you're watching a multi-cassette program.

Your first choice would probably be the only VHS-format stereo VCR—JVC's model HR-7650. Since top-of-the-line VHS format video recorders are roughly equivalent in programmability and quality of performance, for your second VCR pick

a model with one outstanding feature; for instance, VCRs

Continued on page 111



SPECIAL REPORT: INVASION OF THE COUNTERFEIT GAMES

By Frank Lovece

How can you keep 'em down on the farm after they've seen Atari? Well, you can't. While piracy of blockbuster movies onto videocassettes continues, a trendier and potentially more lucrative scam has begun to emerge: video-game piracy. Not only are slick—but illegal—home versions of such arcade hits as "Pac-Man" cropping up more and more frequently, but so are cheap, home made copies with highly questionable value.

When video games unexpectedly boomed in popularity, new aficionados in many areas of the country had to face an inadequate supply of game cartridges, a problem only now being alleviated. Given most enthusiasts' propensity for going after what they want when they want it, it's not surprising that makers of unauthorized copies of video games found ready markets. Indications are that piracy, although concentrated so far on video games designed to play on home computers rather than video-game consoles, is spreading to all facets of the hobby. For uninitiated newcomers, counterfeit games could mean money wasted on poorly reproduced copies that come without any manufacturers' reassurances. Black-market games also pose potential threats to your equipment, through clogging and so forth. Whatever happens, you're stuck.

Piracy by the Numbers

Like most other industry insiders, Tom Lopez of game-cartridge manufacturer Activision is disturbed by the problems of piracy. "If you buy an authorized version that comes with a warranty and an instruction book, it's a much better deal." But observers point to the time it takes for a popular arcade game to finally appear in an authorized home version, and the inexpensive ease of making copies, or "dupes," on home computers.

How widespread has piracy become? According to home-computer consultant and author David Thornburg, "Home copying alone is extensive enough that all software vendors have had to safe-

guard their products to slow down pirating." While the incidence of commercial counterfeiting is still limited compared to videocassette piracy, the trends are nevertheless familiar.

Video games have not only become madly popular among Americans in general—one manufacturer forecasts 10 million video-game consoles will be in our homes by the end of the year—but also among VCR buffs in particular. Crossover ownership, which used to be about 10%, has doubled in the past year according to retailers. Many new enthusiasts are even moving on to home computers, which offer a wider variety of video games with greater sophistication than those available to basic video-game consoles. Many home computers use not only the playback-only cartridges of most consoles, but also erasable, reusable cassettes and floppy discs.

Following the Pattern

The very versatility of the latter two formats has caused some observers to point to a significant trend. According to one home-computer company's in-house estimate, about 560,000 personal computers have been purchased since 1980. There are no official figures for the sale of cartridges, cassettes and floppy discs for these, but if they follow the pattern etched by video game cartridges, there may now be as many as 2.8 million home-computer programs in the hands of consumers—most of whom can make and trade dupes easily, and some of whom are even selling their homemade products.

This possible 2.8 million is greater than the estimated two million or so prerecorded videocassettes sold to retailers in 1978, the year the Motion Picture Association of America calls the first significant one for video-cassette piracy.

When



you consider that Atari alone generated half-a-billion dollars more in sales last year than the year before, the potential bounty for video-game pirates seems plentiful. And so, all sources say, is the number of pirates.

Exactly what constitutes piracy is still uncharted territory, however. On the border is the Computer Software Act of 1980, which spells out the constitutionality of making and keeping archival copies of computer programs as backup. Since these sensitive magnetic programs have been known to vanish without warning, the statute is a necessary one.

'Clone Kit'

Armed with it, adept home programmers routinely unravel copyrighted computer video-game programs and copy them onto cassettes and floppy discs. Less adept enthusiasts can look for help to copying cartridges with such names as "Clone Kit," "Locpik" and "Mirror Image," while others can take trips to legal limbo and buy ready-made "archival" copies from a handful of individual computer stores. One such shop in Michigan, Spectrum Computers, has already felt heat from a floppy-disc games manufacturer that objected to the store's selling cassettes of its copyrighted games, apparently in accordance with the archival-copy law.

Such technical knockoffs and fine shades of meaning seem to pervade most aspects of owning computer video games. Since homemade copies are rampant, so, in technical terms, is piracy. It's also growing simply due to the growing number of computer owners trading programs among themselves. Although such hand-to-hand commerce seems to be the most popular form, uninitiated buyers can easily—and unwittingly—find themselves purchasing unauthorized versions of video games.

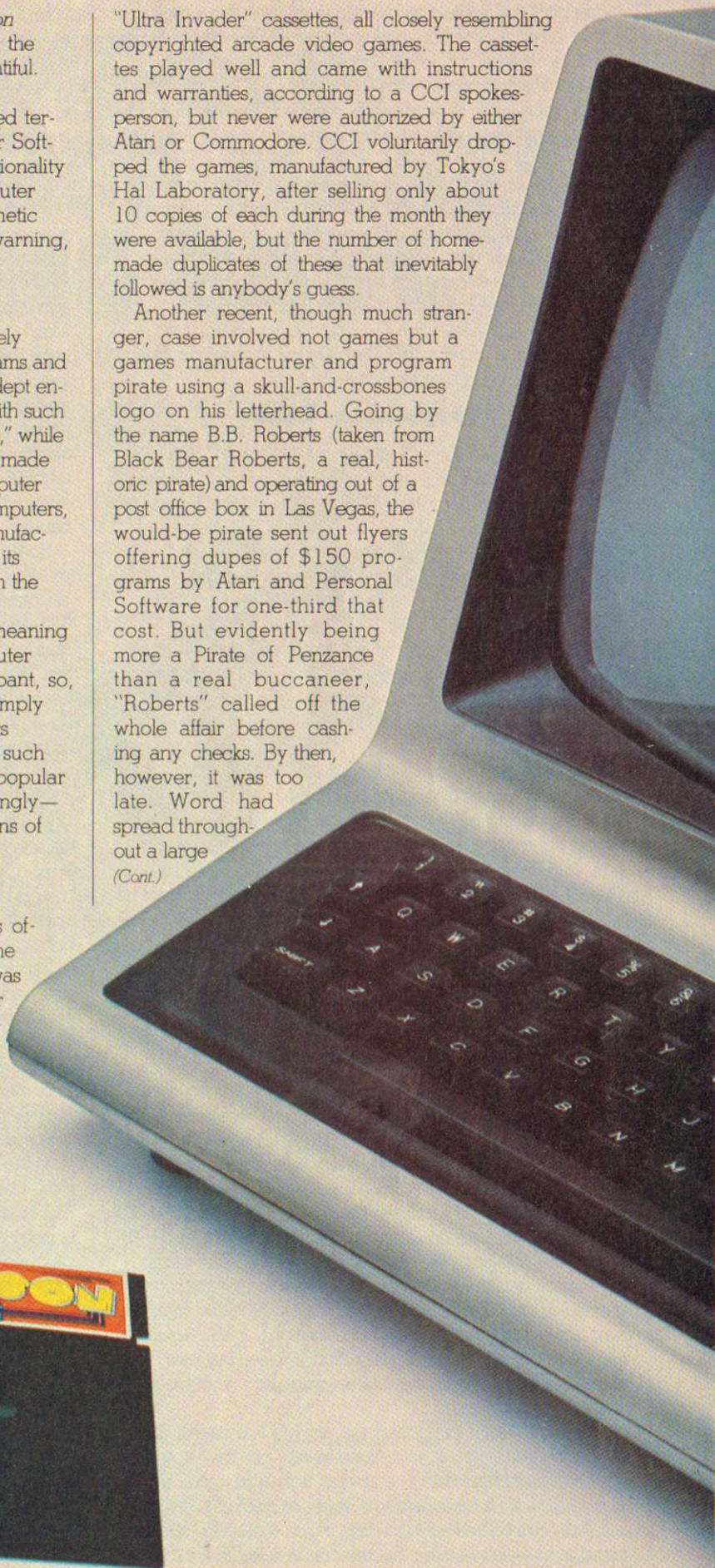
Plying Games

Last fall, for example, half a year before Atari's official April 1 launching of its "Pac-Man" video-game cartridge, Computer Consultants of Iowa (CCI) was marketing a "Packman" video-game cassette for use with Pet home-computers from Commodore—along with "Super Galaxcian" and

"Ultra Invader" cassettes, all closely resembling copyrighted arcade video games. The cassettes played well and came with instructions and warranties, according to a CCI spokesperson, but never were authorized by either Atari or Commodore. CCI voluntarily dropped the games, manufactured by Tokyo's Hal Laboratory, after selling only about 10 copies of each during the month they were available, but the number of home-made duplicates of these that inevitably followed is anybody's guess.

Another recent, though much stranger, case involved not games but a games manufacturer and program pirate using a skull-and-crossbones logo on his letterhead. Going by the name B.B. Roberts (taken from Black Bear Roberts, a real, historic pirate) and operating out of a post office box in Las Vegas, the would-be pirate sent out flyers offering dupes of \$150 programs by Atari and Personal Software for one-third that cost. But evidently being more a Pirate of Penzance than a real buccaneer, "Roberts" called off the whole affair before cashing any checks. By then, however, it was too late. Word had spread throughout a large

(Cont.)



segment of the home-computer community. Atari took notice, hired a private detective to track "Roberts" down and, in a strange mix of corporate power-wielding and frontier justice, pressed no charges but had "Roberts" send out an open letter to confess his misdeeds and warn other would-be pirates—of games or anything else—of Atari's wrath.

Programming piracy isn't even limited to programs on cartridges and floppy discs. A word-processing program printed in *Computronics*, a magazine for Radio Shack home-computer users, was evidently swiped and black-marketed. This despite the fact that the magazine was sending out free copies of the same program as a subscription renewal tool. Unwitting home-computer users ended up paying bootleggers for a program they could have gotten free legitimately.

Swapping the Discs

Swapping is still the biggest source of piracy. "Software trading among friends is extremely widespread," admits Sheldon Leemon, secretary of one of the stricter home-computer users clubs. "I've even seen bulletin-board notices, subtle ones, about 'exchanging' programs." Observers claim that for every game sold legitimately, five to 10 unauthorized copies are distributed among friends, usually on floppy disc.

"Some groups [of personal computer fans] simply don't care," complains Chuck Miller of K-Byte, one of the first companies to independently produce video-game cartridges for home computers. "The members will copy anything and give it to anybody. That's why we decided to market cartridges; they're easier to safeguard." Even so, he says, he's had calls from people who've seen floppy-disc copies of his games being demonstrated in computer stores. Thornburg, who once produced educational software for schools, faced a similar problem. "I would sell one cassette to a school and then find a whole school district using it." A veritable piracy underground is growing with the advent of computer hookup by telephone; Miller says his games have been transferred electronically this way "at least once." Even "harmless" trading among friends can no longer be kept small and local in a wired nation.

Courting Disaster

Still, even now that interstate trafficking is involved, why is there no concerted anti-piracy effort, no video-game equivalent to videocassette piracy's MPAA and FBI task forces? Part of the reason, obviously, is the problem of tracking down pirates of unseeable, untouchable electronic impulses. But another is the case backlog in the courts. Lawyers all around the country, dazzled by the legal ramifications of such new technologies as those of home computers and video games, are gleefully throwing themselves into precedent-making cases. Since so much is new, few such cases find quick resolutions. And lawsuits are piling up like so much dirty laundry, leaving new owners of home computers in the dark as to what's legal and what's not.

At the core of most of the legal activity is a seemingly simple question: What, in a video game, can be copyrighted? Ken Nussbacher, a lawyer with Atari, cites two kinds of possible infringements, those of copying the computer program itself and the copying of the audio-visual displays that show up on TV screens. A legal source with

NAP Consumer Electronics, parent company of Odyssey², agrees, but adds that "ideas, processes and methods" cannot be copyrighted—meaning that if two games (such as Atari's "Pac-Man" and Odyssey²'s "KC Munchkin," which are the subjects of a well-publicized legal dispute) play similarly but have distinct characteristics and audio-visual displays, no infringement is involved. Even the courts are undecided. In the Atari-Odyssey² case, an initial decision favoring Odyssey² was overturned by a higher court, then appealed to a still-higher court.

In a similar lawsuit filed by Atari against On-Line Systems, a Fresno, CA court decided that a floppy-disc game called "Jawbreaker" did not infringe on the "Pac-Man" copyright, even though there are marked similarities between the two games. (In "Jawbreaker," a set of clacking teeth runs through a candy-store maze eating sweets and dodging happy-face circles.) Atari, this country's largest maker of video games for home use, is quiet about future efforts after these mixed results but, says a former consultant still close to the company, "a lot of court cases are coming up this year. Some people have already been handed warrants."

So far, black-market video games seem confined to floppy discs and cassettes. Cartridges are more difficult to counterfeit, and analysts at the Roklan Corporation, a Chicago computer-consulting firm, say the number of home computers in this country is too low to warrant the trouble and expense. But with the population in the same league as VCRs not long ago, and arcade video games as popular as movies, the situation could change anytime.

Preventive Steps

The major game-cartridge manufacturers already anticipate cartridge piracy, in fact, and are taking preventive steps. Odyssey² has safeguards encoded into each of its cartridges and, says a company source, "We've filed patent applications for a process that'll go a long way to prevent not only floppy-disc copying but the unauthorized making of cartridges." Tom Lopez of Activision says his company is studying new ways of safeguarding its cartridges. "There are some modes of protection, more complex than the CopyGuard process used for videocassettes, but implementing them is mostly up to the manufacturer." Atari prefers not to reveal its safeguarding specifics, although its cartridges do have a degree of protection built in.

For new fans of video games, whether home-computer or video-game console owners, this means two things. First, the threat of counterfeit video-game cartridges in look-alike packaging is real and imminent. Such counterfeiting is already commonplace in everything from watches and car speakers to audiocassettes and videocassettes. (See July '81 *VR*.) Second, with the entry of several new cartridge manufacturers, among them Coleco, Games By Apollo and Parker Brothers, the crowded field will make schlock fly-by-nighters more difficult to detect. Telling who from whom and what from which can become an expensive process, at least in the beginning and especially for new devotees.

But don't Pac it in yet. After the legal dust has cleared, the pirates' grace period will be over. That may or may not be welcome news, depending on your point of view, but a basic rule of economics holds true in either case: You'll get what you pay for. □



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Estimated product availability of Pac-Man, Centipede and Caverns of Mars mid-1982.



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Phil Wiswell

You can become a gadflying Ace from the comfort and safety of your living room with a recently released game cartridge from Activision. In fact, Activision will even grant you Ace status if you beat the times

they've set up for each variation of "Barnstorming," and we have some hints about how you can do it.

"Barnstorming" is based on the exploits of those "seat-of-the-pants" pilots who, not long after the airplane was invented, thought up all sorts of dangerous things to do with it. They not only strafed farmers and swerved through slalom courses of trees, windmills and bridges, but actually attempted flying through barns whose two end doors were open!

Air-Devils

"I've always been a fan of those daredevil pilots and their aerobatic feats," says Steve Cartwright, a game designer at Activision. "I wanted to recreate the thrill and challenge of their exploits in a video game." And that's just what he did in creating "Barnstorming," an original release from Activision.

The object in all four variations of the game is to pilot the biplane on a steady course over windmills, around flocks of geese and through a set number of barns in the least time possible (scored to $\frac{1}{100}$ of a second). The joystick controller is used to increase or decrease altitude, and the fire button is used as an accelerator. You can only go up, down, slower or faster, making the game simple to operate.

Other than your yellow biplane, there are only three elements in "Barnstorming": windmills, barns and geese. You must try to fly over windmills because ramming one will set you back a few precious seconds. By going under the roofline of a barn, your barn count will decrease by

one. But, if you miss and end up crashing into a barn, you'll be penalized a few seconds. The third, and trickiest, element is the flock of geese. At the beginning of the game, they fly in formation at the top of the screen. As soon as you change your airspeed or hit one of the geese, though, the formation changes and becomes troublesome to navigate.

Hitting a goose will not cause you to crash, nor will it kill the goose. However, you'll lose about one second and the goose will get pushed ahead of you. Don't keep pushing the same goose; it will slow you down too much. If you have the awkward choice of hitting a goose or a windmill, hit the goose.

Becoming an Ace

Once you've become proficient at flying, you'll probably try some tougher games. By setting the left difficulty switch on "A," your clearance of barn roofs will be lowered. And by setting the right difficulty switch on "A," more geese will be added to the flock.

Activision challenges all Barnstormers to qualify for the Ace Squadron by meeting or beating 33.3 seconds on Game One, 51 seconds on Game Two or 54

seconds on Game Three. Send a photograph of your score along with your name and address to Activision, Inc., 3255-2 Scott Blvd., Santa Clara, CA 95051, and you will be enrolled automatically.

To help you qualify, here are some quick flight lessons for you. What follows are the patterns of barns and windmills as you will encounter them in Games One, Two and Three.

(Game Four uses a random pattern.)

"W" stands for windmill; "B" for barn.

Game One: W B W B W B W W B

W W W B W B W W B

B W B W W W B

Game Two: W W W B B B W B W B

W B W W W B W W W

B W W W W W W B B

W W W B W B W B W

B B

Game Three: B B W W B B W W W

B W W W B W W W

W B B W B W W B B

W W B W W W B W

W W B W W W B

If you miss any of those barns along the way, you'll have to go farther in the program to make them up. By memorizing these patterns, at least you'll know what's coming at you—whether to fly high or low—and that will improve your scores.

Happy flying. □



ULTIMATE...

Continued from page 41

by GE (1VCR2014W), Mitsubishi (HS-310U), Quasar (VH5610TW) and some others have wireless remotes. The ultimate system shouldn't be trussed up with miles of wires.

Among Beta-format models, the new Marantz VR-200 is about the most advanced around, with stereo sound and built-in Dolby C noise reduction. But if it's taping and lots of it that's drawn you to video, you might prefer to go with Sony's model SL-5800, to which you can add the Sony Betastack, a cassette changer holding enough tape for 20 hours of programming.

Portable VCRs

Bridging the gap between tabletop models and portables is Technicolor's CVC-format recorder model 212. At the present time, this lightweight VCR can record up to one hour of tape.

Light weight may be the most important criterion when choosing a portable VCR, as anyone who's ever carried one around for more than a few minutes will tell you. But features are just as important, for taping with panache.

Among Beta-format portables, only the Marantz VR-100 has stereo, but it probably won't be for sale until another month or so. Others you could buy today with the proceeds of the million-dollar check include the Sony Betapak (model SL-2000), the even slimmer model SL-2500 and Sanyo's model VPR4800.

JVC's Vidstar (model HR-2200) is probably the top contender among VHS-format portables. Aside from the excellent quality of its image, it's also one of the few VHS portables, along with RCA's models VFP170 and new VGP170, to offer full-function remote control. Only Akai's Activideo (model VPS-7350) has stereo capability and Dolby noise reduction circuitry. And only Sharp's My Video comes with a tuner/timer built in.

Videodisc Player

With only two videodisc formats to choose between, and few companies making equipment, picking the right player isn't all that complicated. Since many of the prerecorded programs you can get on disc are also available on tape, and you already own six VCRs, you should look for what a disc player can do that a VCR can't.

Pioneer's new LD-1100 is the most advanced among the LV-format players, since it incorporates CX noise reduction circuitry and improved stereo performance, along with faster random access.

Some stereo CED players will be introduced this month. Meanwhile, Elmo, Hitachi and Toshiba have stereo-ready players that will take an adaptor once stereo programs are available. But since you don't have to bring home any change from the million-dollar check, you could pick up one of these players to take advantage of the larger number of movies on these discs.

Camera

Currently, the *ne plus ultra* of videocameras is Hitachi's VK-C1000. It's the only camera that solves the smearing problem—by having no tube at all. Instead, this camera uses only solid-state circuitry. Not only does it give you about the best image quality around, but this camera is also one of the lightest there is.

If you're interested in something a little more conventional, you could try Hitachi's VK-C800, with its Saticon tube for almost smearless pictures; the RCA CC011 videocamera, with its highly advanced Newvicon tube and relatively streakless images; or the Sony HVC-2200, an extremely light-sensitive videocamera with a Trinitron tube and such unique features as a waveform monitor to help you set controls precisely.

Computer

No self-respecting millionaire should be without a home computer. After all, how else can the person who has everything keep track of everything? Look for the amount and variety of programming and the number of add-ons (a printer, for example) you can get.

The Apple II+ may not be able to keep the doctor away, but it can do just about anything else. Other good home computers are made by Atari, Commodore, IBM, Mattel and Radio Shack, among others.

Should your computer use floppy discs or cassettes, you'll also want to get a video-game console that accepts cartridges. Atari, Bally Arcade and Mattel top this list.

Satellite Dish

One possibility any wealthy video aficionado would relish is adding a

satellite receiving station to the back yard. You might as well shoot the moon and invest in the \$25,000 consumer system from Scientific-Atlanta. This system features a six-meter, rotatable dish, with a motorized mount, and a digital tuner for scanning the cosmos at the press of a button.

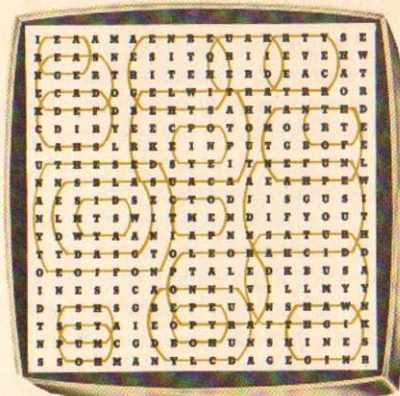
Other Components

There are plenty of ways to put all the pieces together, but one of the best is with Kenwood's Audio/Video Amplifier. This device lets you hook up a VCR and a disc player to two VCRs and audio equipment. It's especially handy for dubbing new audio tracks onto a tape, or for dubbing from another tape or a disc onto a master tape.

Not to be extravagant, but you probably should get an extra set or two of speakers. Television amps just aren't powerful enough for the biggest audio-system speakers, so you have to get speakers that are high fidelity without needing a lot of juice, such as the KEF model 105.4.

This ultimate system consists of at least six VCRs, one or two disc players, a home computer, a video-game console, a camera, at least three television sets/monitors, an earth station, an antenna and/or a cable TV system, a few black boxes, some speakers and a satellite dish. Yet the whole package amounts to no more than a measly \$150,000. That leaves you with about \$850,000. But don't spend this money foolishly—put it away so you can keep updating your system as new and more sophisticated equipment comes along. □

SOLUTION TO LAST MONTH'S PUZZLE



Secret message: "I am a sensitive writer, actor and director. Talking business disgusts me. If you want to talk business, call my disgusting business manager."—Sylvester Stallone