Revolution at the Hearth

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GIANTS OF COMMUNICATIONS

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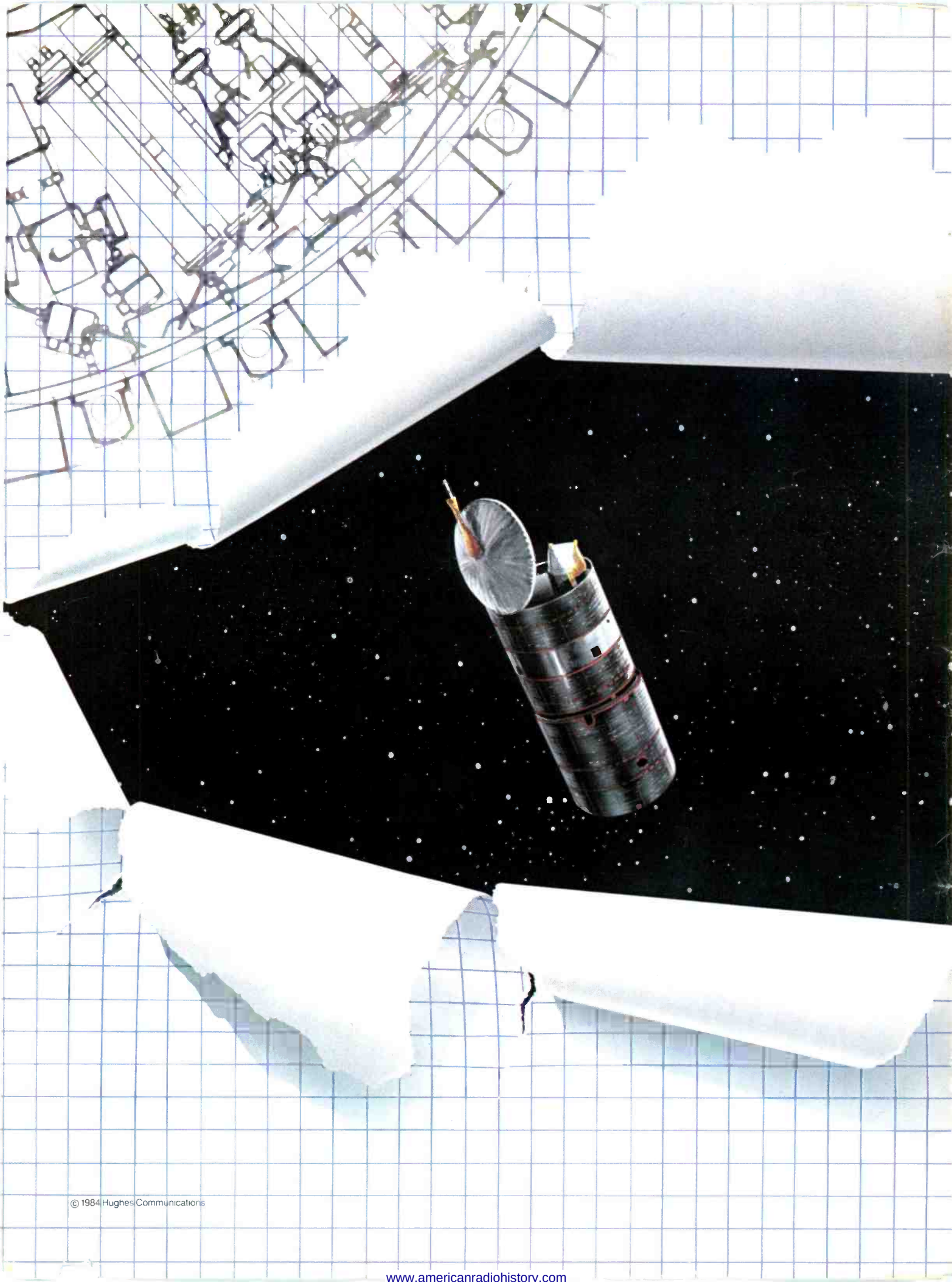
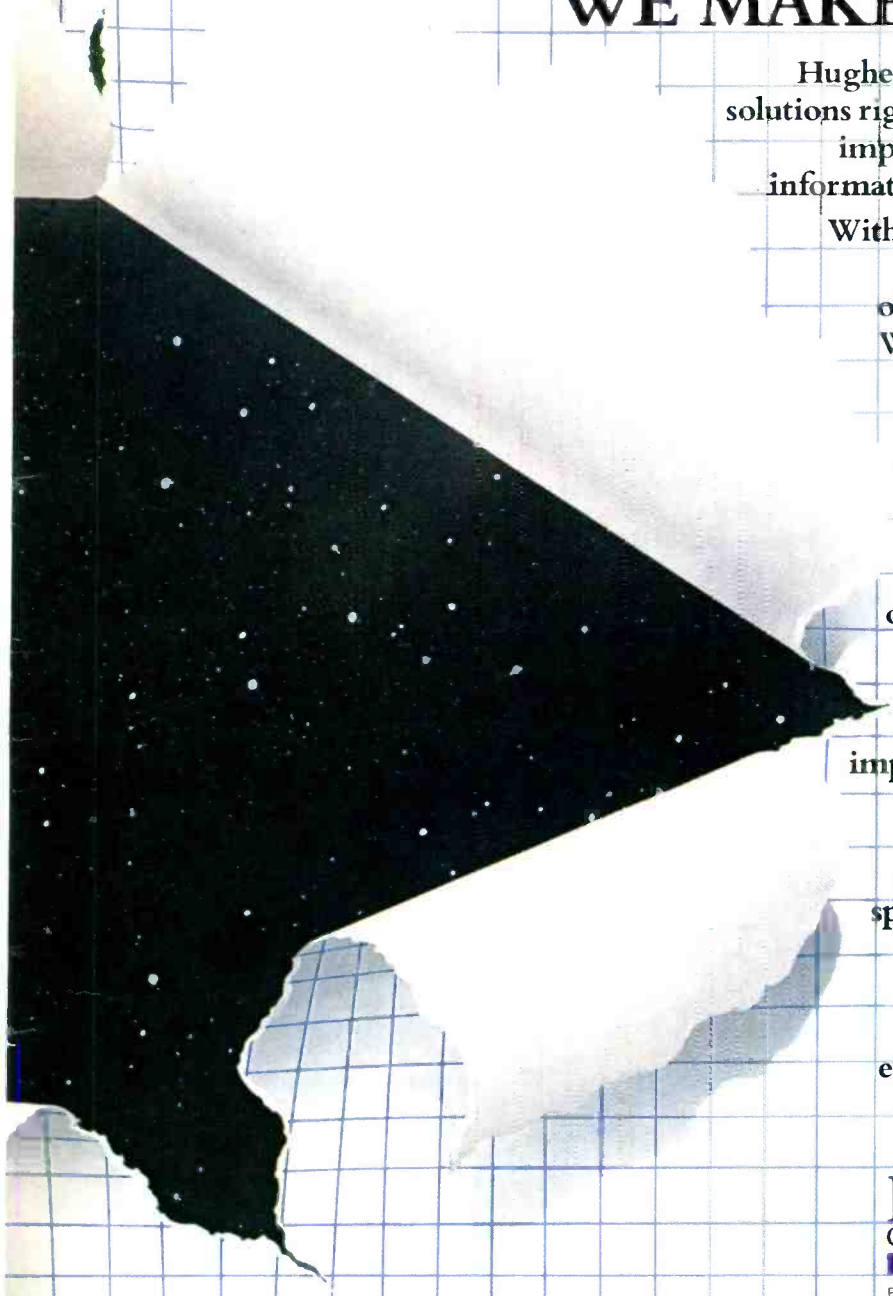
The Essential 1985 Field Guide To the Electronic Media

CONTENTS





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INTRODUCTION:

THE ELECTRONIC HEARTH

When *Channels* published its first *Field Guide*, the world of new electronic media was very young. Those were the innocent days when all that was known about most of the new communications technologies was what they were *capable* of doing. Each was a marvel. What wasn't known was which of these technologies would fly, how long it would take for any of them to establish itself, and whether one would be another's undoing.

That time of innocence, incredibly, was only two years ago. How swiftly things have moved on the electronic frontier.

The first *Field Guide* was created to sort out the chaos of technologies. We did that by classifying the new media according to family, species, and subspecies, as if they were the flora of the natural environment. A year later, with the *1984 Field Guide*, it was possible to report on how the technologies were performing in relation to each other and to portray the battles of the marketplace.

Now, with the third edition of what has become the annual report on the entire field of electronic media, we begin to see a separation of winners and losers. We see also how corporate strategies change when grand dreams encounter hard reality. New alliances are being formed, not only among the companies in the fray but also among the technologies themselves: cable joining with telephone for interactive services, the computer with television for digital processing, the computer with telephone for videotex. The electronic landscape is beginning to assume a shape.

First came the technologies, then the large corporations with fortunes to invest. Now comes the consumer to decide what will have a place at his electronic hearth. He has entered the picture not as the passive viewer this time, but as a force to determine how the rest of the story unfolds. L.B.

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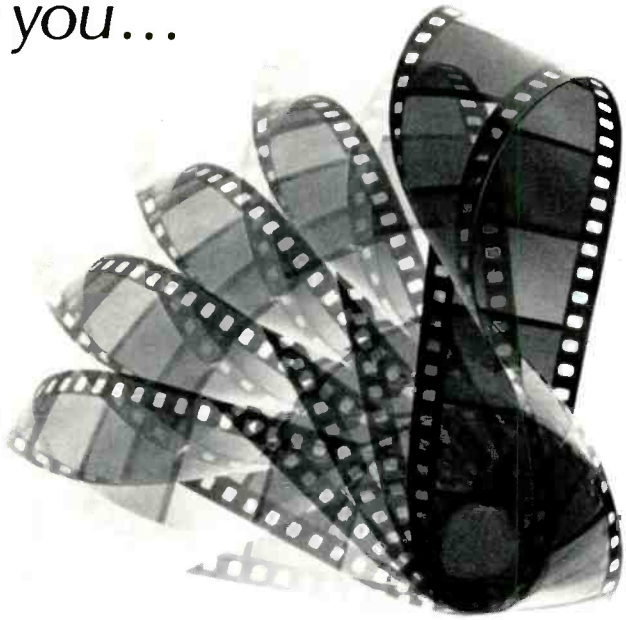

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PERSPECTIVE:

THE REVOLUTION STRIKES AT THE HEARTH

BY LES BROWN

Broadcast television had a boom year in 1984—record revenues and profits, just like old times. When one of the quarterly reports was issued, a network executive, wanting to be sure I grasped its full significance, called to point out that the new highs were achieved with plain, everyday broadcasting. And then he added, with a trace of sarcasm, "By the way, whatever happened to that revolution you've been writing about?"

The video revolution did indeed seem to be cooling down, if not petering out. RCA had shut down its video-disc operation. ABC put the gun to TeleFirst, its home-taping pay-TV venture in Chicago. Video games were in steep decline, over-the-air subscription television was in a tailspin, and the direct-broadcast satellite industry couldn't seem to get its act together. Videotex and teletext still hadn't become household words, and multichannel MDS remained just a rumor as an alternative to cable.

Meanwhile, cable lolled in the doldrums, having lost much of its glamour in the shakeout of satellite networks and the general disenchantment with Warner Amex's interactive Qube system. Satellite transponders, once thought of as gold mines in the sky, were in greater supply than demand, and HBO, which was a skyrocket a few years ago, lost some of its thrust.

Companies that had plunged into the communications revolution so as not to get left behind scrambled out and left the revolution behind, along with hundreds of millions in venture dollars.

From the casualty reports in the business press, a reader could be forgiven for thinking that conventional television had met the whole phalanx of menacing video technologies and had vanquished each and all. But the bloody tales are somewhat misleading. One has only to look in other directions to see that the revolution is still barreling along. It has been, for example, a lively year for companies involved with home video, home computers, digital audio discs, laser video discs, backyard satellite dishes, telephones, and cellular radio.

Anyone driving through the American countryside can hardly fail to notice the outcropping of giant upended mushrooms pointed at the sky, and the emergence of video rental shops in virtually every town.

What happened during the last year or so is that the consumer had found an alternative to the wholesale media in the ones purchased individually at retail. The wholesale media are the electronic delivery systems that beam out their signals to a broad audience; the retail ones are gotten over the counter. In the turbulent marketplace, the buying public drifted to what it understands best, consumer products—palpable add-ons to the television set and other new gadgetry for the electronic hearth.

Perhaps, at bottom, we trust appliances because we can control them, more than we do delivery systems, which control our options.

Since it is human nature to prefer the familiar to the unknown, we can more comfortably buy a large dish that receives 75 satellite channels—basically a giant-sized version of orthodox television—than subscribe to some magical system like two-way cable, which promises to change completely our relationship with the medium. The latter presumes we want such a change, when we're not really sure we do.

Of course, there is no telling whether the communications revolution will continue on this course and settle in firmly at the hearth, or shift its direction yet again. Two years ago cable was the media superstar; a year later it was satellites. The winds shift rapidly and capriciously on this uncharted frontier. Technology produces new marvels by the day, and conceivably something new may come along to send cable soaring again and divert our spending from video appliances. The chances for such new developments are greater than they have ever been because the upheaval in communications technology is no longer exclusively an American phenomenon.

Several other countries have joined the communications revolution. Luxembourg and Britain could well solve the riddle of DBS before we do, and France may prove to be the world's laboratory for fiber-optic cable and videotex. Yankee

There has been a shift in the direction of the communications revolution—from media that transmit signals wholesale to the ones purchased at retail.

ingenuity will undoubtedly borrow whatever successful formulas emerge from the European ventures.

The current phase of the revolution in America is, in a manner of speaking, an import from abroad. The wide proliferation of video-cassette recorders was experienced in Japan, England, and much of Western Europe before it started happening here. (Every American VCR, of course, is imported.) And stereophonic television, which is just beginning to be marketed in the U.S., is already an established technology in Japan and West Germany.

A few cable networks, such as MTV, The Disney Channel, and The Nashville Network, are already transmitting their programming in stereo, as is at least one public television station—WTTW, Chicago. The major American networks are now tooling up for stereo telecasting, believing it will do for them in the '80s what color TV did in the '60s, while at the same time slowing the growth of the competing wholesale media—cable, DBS, and MDS. Expectations are that the consumer will give first priority to upgrading the TV receiver at home before investing in exotic new systems. Moreover, since stereo sound for television makes it possible to broadcast in two languages simultaneously, the networks regard it as their best opportunity to attract the large and still-growing Spanish-speaking audience served almost exclusively today by the Spanish International Network.

Retail television seems to be working entirely in broadcast television's favor, but the advantage may be only for the near term. Because if the consumer is going to deal over the counter to equip himself for television's new age, he will also increasingly be shopping retail for programming. By now, some 19 percent of American homes have VCRs, and experts forecast a penetration of 30 percent or more by 1990. Britain and Japan are already approaching 30 percent penetration.

As the market grows for VCRs, the market for original programming made expressly for home playback will broaden correspondingly, not only domestically but globally. This would provide the narrowcasting that cable once promised, and it would be the most democratic form of television, as open to independent voices as book publishing is.

Wholesale television—broadcasting, cable, and DBS—requires huge audiences for success, but retail television does not. The scale becomes drastically altered. A prime time television series needs to reach 30 million viewers each broadcast to survive, while a movie cassette can be handsomely profitable selling as few as 50,000 copies.

Even at today's high prices for cassettes, and the relatively small penetration of playback machines in the home, the Hollywood studios have already found the home video market more lucrative for movies than network television and nearly as rewarding as the existing pay-TV field.

Inevitably, wholesale television will feel the brunt of retail television's expansion. Because, just as it is true that there are limits to how much money people can spend for entertainment, there are also limits on their disposable time. Cable, the pay networks, independent stations, and home computers have already claimed a share of the consumer's leisure hours that used to be spent watching network television. Home video, as the British have already found, may make the largest claim of all.

VCRs:

THE HOTTEST THING SINCE TELEVISION

In 1975, when Sony introduced Betamax, the first practical home video-cassette recorder (VCR) at a consumer price, a top programming executive at each of the three commercial networks was asked about the implications of this new contraption.

Two of the network men shrugged off the Betamax as a novelty that that would have absolutely no effect. The third speculated that it would be 20 years before a significant percentage of American homes had VCRs, and said, "By then I'll be retired, and somebody else will have to worry about it." But at the end of 1984, the executive hadn't retired yet and at least 19 percent of American homes, nearly one in five, had VCRs.

As recently as 1983, a cable industry researcher called the VCR a "sleeper" that could have some kind of long-range effect.

Sleeper indeed. In the VCR's first decade, it "penetrated" (as marketers say) American homes more rapidly than did color television sets during their comparable introductory period—in fact, more rapidly than did any home electronic gadget except television itself.

People in the video-programming and distribution business were completely blind-sided because they considered the VCR a piece of hardware and, as one programmer put it, "I'm not interested in the hardware business." Now programmers are becoming very interested indeed in pieces of hardware. This one in particular lets viewers rearrange at will the schedules that programmers have sweated and bled over. It lets the formerly captive audiences watch somebody else's prerecorded programs instead of network offerings, and even lets them zap commercials out of the network shows.

MARKETPLACE: Annual sales of this trouble-making machine have grown steadily from an estimated 30,000 units in 1975 to 400,000 in 1981, then to 2.9 million in 1982, 3.3 million in 1983, and at least 7.5 million in 1984.

Not coincidentally, typical retail prices for VCRs dropped from $1,300 in 1975 to less than $450 in 1984, with still lower prices anticipated in 1985 as Korean manufacturers compete with the Japanese for the first time.

VCR sales are expected to level off in 1985 after their spectacular opening climb. But Hugh M. Beville, Jr., former planning vice president of NBC and retired executive director of the Broadcast Rating Council, has estimated that even if sales level off at an average of seven million a year, the recorders will be in 51 percent of American homes by 1990. By the same year, he forecasts, cable will be in a maximum of 52 percent of homes. In the five ensuing years, Beville predicts that the VCR will actually surpass cable's penetration.

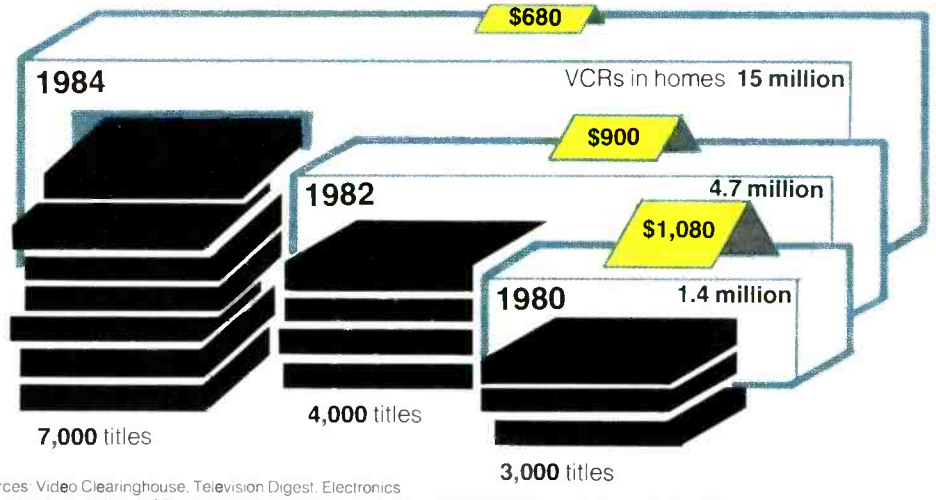
A major reason for the machine's popularity is that it can do so many things. Surveys repeatedly have shown that people buy VCRs primarily for their time-shifting capability—the ability to record a program and store it for later viewing. Largely for that purpose, Americans bought more than 100 million blank video cassettes in 1984, up from 65 million the year before. A cloud of illegality hung over off-air taping for seven years, but in January 1984 the Supreme Court cleared it away, ruling that time-shifting doesn't violate copyright law. With the resolution of the famous "Betamax case," VCR manufacturers ceased inserting little cautionary notices in their advertisements, much in the manner of the Surgeon General's cigarette warning, that home taping may infringe on copyrights.

While time-shifting is the first use in the minds of new VCR owners, once they bring the machine home they discover the vast trove of prerecorded programs available for rental or purchase. A survey by the 3M Company found that 40 percent of VCR owners rented or bought programs on cassette in 1980. The number climbed to 60 percent in 1981, 67 percent in 1982, and 78 percent in 1983.

VCRs are now available under approximately 40 brand names in the United States, although all are being made by about a dozen manufacturers in Japan. Both VHS and Beta, the two incompatible cassette formats, sell in large enough numbers to stay in the market, although the VHS format outsold Beta by about three to one in 1984. Beta recorders are frequently advertised at prices as low as $265, while VHS models generally sell for $50 to $100 more than corresponding Beta models.

THE VCR COMES HOME

Average selling prices drop, more people own VCRs, and more prerecorded tapes become available.



Sources: Video Clearinghouse, Television Digest, Electronics Industries Association. (VCR price based on average wholesale price reported to EIA, plus 40 percent markup.)

TV and cable people were completely blindsided by this new medium they mistook as a simple piece of hardware.

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TECHNOLOGY: The top-of-the-line VHS and Beta models now offer the most significant recent improvement in video recording: extremely faithful, clean stereo sound, potentially better than that achieved by an open-reel audio tape recorder.

Previously, audio had been a weak link in VCR performance. Until last year, all VCRs recorded and played back sound on a track along the edge of the tape, which was scanned by a fixed magnetic head. The video track, however, was recorded in diagonal segments on the tape and scanned by heads on a rapidly revolving drum—meaning that much more detailed visual information was being scanned. Because the tape moved more slowly in relation to the audio head, sound quality was extremely poor.

VCRs boasting "hi-fi stereo" now put the audio as well as the video on the diagonal track, which is scanned by revolving heads. And to preserve compatibility with older or cheaper VCRs, the old-style linear soundtrack is maintained as well. Hi-fi models, originally priced at more than $1,000, have been spotted with tags as low as $600.

The third home use of VCRs, after time-shifting and playing prerecorded cassettes, is video photography, for which a video camera is a required accessory. Traditional 8mm home-movie making has tapered off dramatically in recent years, but some half-million home video cameras were sold last year, one for every 14 VCRs sold. About 12 percent of those VCRs were portable models whose optional operation on battery power is useful in taping away from home.

One-piece portable units combining camera and battery-powered recorder are now available to record Beta cassettes, and "camcorders" that can record on full-sized VHS cassettes are on their way to market.

A smaller cassette, using 8mm video tape, is being used to allow even lighter and smaller camcorders. Technical standards for the 8mm format were agreed upon by a group of 122 VCR and tape manufacturers in April 1983, but most are now reluctant to detract from their very healthy VHS and Beta sales by introducing the new format. They seem to regret ever having agreed to anything so radically different.

But both Kodak and Polaroid have no vested interest in the older cassette formats, and are aiming their new 8mm video camcorders at camera enthusiasts. (Matsushita and Toshiba, respectively, are making Kodak and Polaroid camcorders. General Electric also plans to sell an 8mm Matsushita model.)

On the drawing boards now are the next generation of "super VCR" machines, which will do for video pictures what the recent hi-fi models did for sound. Using advanced tape formulations and video recording techniques borrowed from broadcasting, they will be capable of providing breathtaking picture quality (while maintaining compatibility with existing machines and tapes). Super VCRs are expected to start appearing in spring 1986. In the meantime, VCR prices will continue to plummet, and hi-fi sound and other electronic refinements will spread among the more expensive models.

In 1984, the VCR completed its transition from hobbyist curiosity to a household appliance comparable in utility and ubiquity to the television set or washing machine. Like it or not, this piece of Japanese hardware has spawned a major communications medium.

DAVID LACHENBRUCH

VCRs are entering homes at the rate of nine million a year. In five years, they may exceed cable's penetration.

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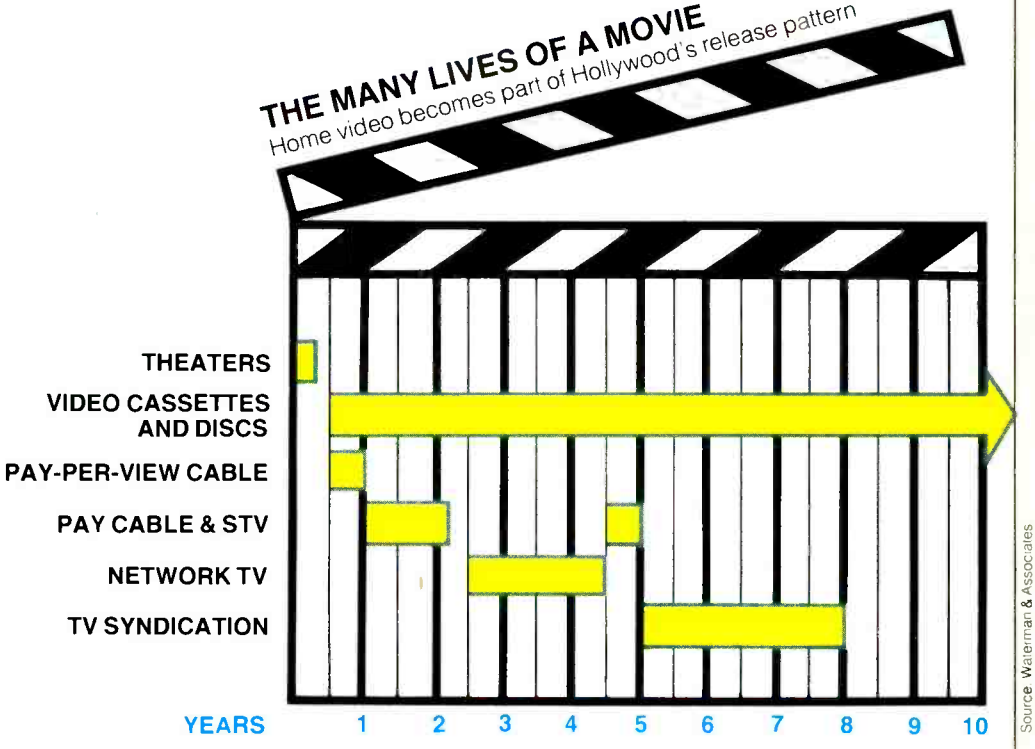

Whenever an infant industry racks up $1.6 billion in sales and rentals in a year, as home-video software did in 1984, it inevitably prompts the principals involved to ask: How can I get a bigger share?

For the Hollywood studios, that's no idle question. One way or another, the studios want to sell more cassettes in 1985 and get a bigger piece of the video software action.

One way would be to cut the usual price of video cassettes to $20 or $25 so that people might make a habit of buying a movie after—or even instead of—seeing it in a theater. All eyes will be on the results of a Christmas 1984 price-cutting experiment in which Paramount Home Video listed 25 movie cassettes at $24.95 apiece, while other studios were holding out for $79.95.

The other way Hollywood could earn more from home video would be to persuade Congress to amend the copyright laws, giving the studios a piece of the booming cassette rental business. That would probably send rental prices up, but would also allow the studios to drop the selling prices of cassettes.

It's appropriate for home video to be high on Hollywood's agenda. Two-thirds of all cassettes sold are theatrical movies, and each year the movie industry earns a greater share of its revenues (12 percent in 1983) from home video. Ahead, it's not hard to imagine a studio releasing a cassette at the same time the movie opens in theaters, and earning more from the cassette than at the box office. And Hollywood is good at imagining.

MARKETPLACE: Over the years the movie business evolved a release and pricing pattern designed to get the maximum dollar for every film. In the late 1930s, a feature would open in a downtown movie palace charging 75 cents, and would eventually play the neighborhood Bijou for a dime a head, with as many as 12 distinct theater runs altogether. In the 1950s television became part of the release pattern and, later, so did various kinds of pay television.

Until the cassette came along, the theatrical first-run was supreme in its ability to earn money from those moviegoers most eager to see the film. Revenue-per-viewer fell off sharply as a movie grew older and turned up on television, first network and then local. With the exception of pay-per-view TV, which still figures in Hollywood's fondest dreams, television had no way of charging a premium to eager viewers.

On the average, Hollywood takes $1.50 per viewer from a theatrical run, then 25 cents or less per household watching on pay television, and only 5 cents per household watching on network television, according to Smith Barney analyst Mara Miesnieks. In comparison, a $50 cassette returns an average of $5.80 to the studio when it's sold, estimates economist David Water-

Hollywood should be rejoicing over the windfall from the burgeoning home video market, but instead the boom is creating havoc in movie economics.

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News photo of D-Day invasion, June 6, 1944

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man. If Hollywood were writing the script, the cassette would become an instant star on its balance sheets. Instead, as Waterman points out, it is causing havoc in movie economics.

Cassette renting has become so popular that 24 percent of video shops have a competitor within one block, according to a 1984 survey by *Video Store* magazine. And the shopkeepers say they're renting 4,000 to 5,000 cassettes a month while selling only 100 to 300. Nationally, consumers spent $1.2 billion on rentals in 1984, and just $400 million on software purchases, the Yankee Group has estimated.

That wouldn't be so bad for the studios if they got a cut of the rentals. But they lose that claim by selling the cassette to a rental shop, according to a longstanding interpretation of copyright law called the First Sale Doctrine. As a result, studios try to recover some of that rental money indirectly by setting high prices on most cassettes. Doing so, however, they lose sales to average consumers who can't afford $79.95 for a movie.

Studios *could* charge much lower prices. The cost of a blank cassette and duplication is only $8, and may soon drop to $5. Paramount, Disney, and other studios have been so successful selling selected cassettes at lower prices that more than half of all sold are priced under $45, according to a 3M Company survey. For some time Paramount hits have been listing at $39.95, and the firm gambled that a $24.95 list price at Christmas would pay off. Early indications were positive: The company got the largest opening order in video history—650,000 cassettes.

REGULATION: Other studios have told Congress they'll also lower cassette prices to pursue mass-market sales as soon as the First Sale Doctrine is overturned. But in 1984 they were out-lobbied by some of the 14,000 video dealers and their allies. "Hollywood does not have a mom-and-pop store on every corner in America," explains Warner Communications attorney Tim Boggs. (Congress did, however, repeal the doctrine as it applies to audio recordings, stemming the development of a commercial record-rental industry.)

Sources say the studios' next try will be for a "two-tier" system. Certain cassettes would be wholesaled to dealers at hiked prices for rental, and others at lower prices for sale. But the opposing coalition argues that this would only raise rental prices for everyone, since video stores would pass along their higher costs to customers. "It's no secret that the studios want to make the rental price equal to two movie tickets," says Gary Shapiro of the Electronic Industries Association. Rentals now cost as little as $1 or $2 a night.

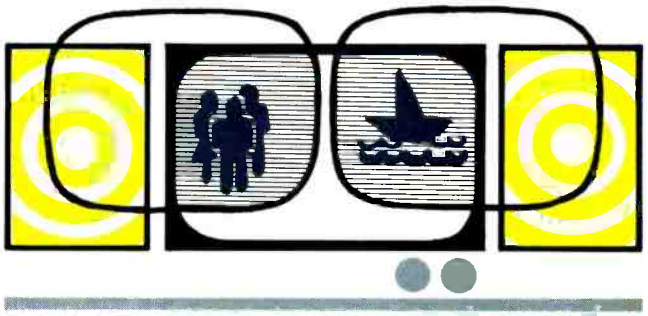
In response, studios can argue that repeal of the First Sale Doctrine would increase cassette sales, thereby stimulating producers to boost the quantity, quality, and variety of productions. Indeed, 30 percent more films were started during the first three quarters of 1984 than during the same period in 1983. Independent producers see cassette sales, with their big per-viewer return, supporting narrow-audience productions. Producers also argue that the doctrine is an anachronism of a pre-VCR time that deprives them of a workable way of collecting pay for their labors.

But there's an emotional appeal to the opposing case, which asserts that any new income for the moviemakers would largely disappear into more extravagant Hollywood salaries and boondoggles. Moviemaking costs have doubled in six years anyway. As a studio lobbyist admits, Hollywood's fat-cat image is a terrible handicap when you're pleading for the sympathy of Congress. STEVE BEHRENS

Mom-and-pop video shops fended off the movie industry's attempt to gain a share of cassette rental revenues.

ENHANCED TV:

SET FOR THE FUTURE



The technical standards for American television are now nearly 50 years old, but they've proven flexible enough to accommodate new developments. The first major enhancement of the standard ("NTSC") television signal was compatible color, added in 1954. Thirty years later, in 1984, the electronics and broadcasting industries came up with another significant enhancement—multichannel television sound.

As stations modify their equipment to transmit stereo sound, viewers buying one of the new stereo-equipped TV sets will be able to receive stereo as well as a third audio channel, which can be used for a Spanish or other second-language translation of the soundtrack.

Today, engineers are considering ways to give viewers a new generation of television picture as well. While there has been much industry talk about elaborate plans for high-definition television (HDTV), a development that would require new transmission standards, some sets are on the way that will produce comparable results without requiring changes in the way television pictures are transmitted. Those sets will have new digital circuitry, seemingly enabling them to extract more picture from the signal than it actually contains. Using computer technology to generate and insert plausible intervening lines between the video lines actually broadcast, these sets can produce a finer-looking 1,050-line picture from today's 525-line transmissions. The result is a startlingly clear illusion of high definition without the cost and disruption involved in actually broadcasting more visual information. (A major sticking point delaying the advent of actual wide-screen HDTV is the fact that it would require the equivalent of two channels to transmit one high-definition channel.) Large-scale production of digital 1,050-line sets awaits only the development of digital storage devices priced low enough for the mass market. These are expected to be available within a year.

As digital technology infiltrates the TV set, it will permit the complete elimination of ghosts and electrical interference, and will incorporate special effects, including the ability to freeze the television picture and to display two channels simultaneously.

The utility of the TV set is also being enhanced as it evolves into the electronic control center of the home. A General Electric system already on sale uses the TV screen to display the status of all electrical lights and appliances in the home, and employs the set's remote control unit to issue instructions (for instance, to turn off the living room lights at midnight). DAVID LACHENBRUCH

Digital sets of the near future will offer sharper pictures as well as freeze frames and other special effects.

Some of the best North American shows aren't American.

They're the high-quality, audience-winning productions of the Canadian Broadcasting Corporation – CBC Television.

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Programs that are established hits in Canada, and around the world.

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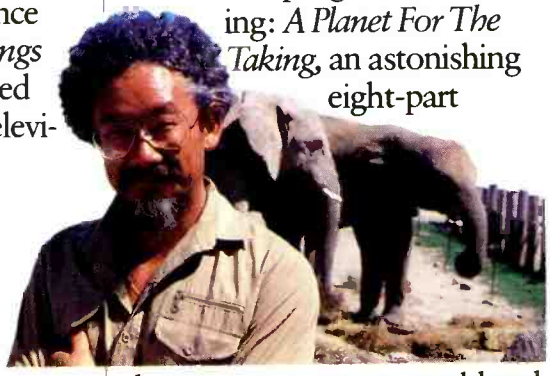
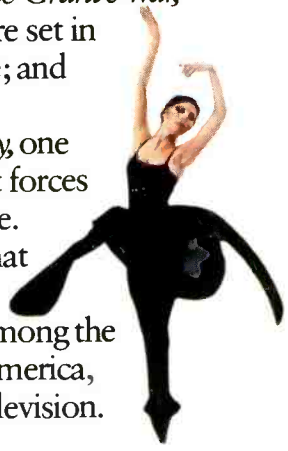


And our programs are critical successes too. CBC Television has been honoured with three Academy Awards in as many years – for *Boys and Girls*, produced by Atlantis Films, *Just Another Missing Kid*, and *CRAC*.

Among our nine shows which won International Emmys are *Fraggle Rock*, Jim Henson's fanciful hit show; *L'Oiseau de feu*, featuring breath-taking dance performances; and *Fighting Back*, a poignant documentary.

And Much More.

Our tradition of quality continues with many exciting new programs, including: *A Planet For The Taking*, an astonishing eight-part documentary on our world and its future; *Charlie Grant's War*, a gripping feature set in wartime Europe; and *The Paul Taylor Dance Company*, one of the dominant forces in modern dance.



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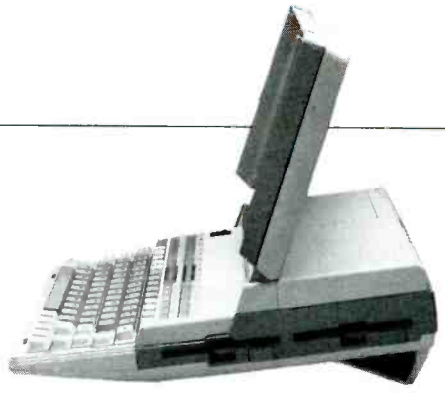
PERSONAL COMPUTERS:

'BIG BLUE' CALLS THE TUNE . . .



A new nine-pound "lap" portable from Data General has a full 25-line liquid-crystal screen in its lid.

The year 1984 always had a special relevance to the computer industry. In the minds of many people, computers have been helping to concentrate the power of information, accelerating the dehumanizing process so vividly depicted in George Orwell's landmark novel. But the advent of personal computers meant that people could claim some of that power for themselves. Just plain folks would have Big-Brother-sized information-handling abilities in their own typewriter-sized machines. As Apple Computer promised in a commercial that ran during the Super Bowl: "1984 Won't Be Like *1984*."

To a large extent, that brash statement was justified. Computer power continued its populist trend toward decentralization and affordability—more power to the common person, for less money. The typical personal computer two years ago cost maybe $4,000 and had perhaps the power of a $120,000 minicomputer in 1961. Someone buying a typical personal computer for business today will pay no more than he would have two years ago, but will get the power of a multi-million-dollar mainframe computer of the early '60s. And the tasks he can complete with the machine were not even contemplated a decade ago.

Almost eight million home and office computers will be sold this year, at a total outlay of $2.7 billion, according to Future Computing Inc., an industry research firm. Only a negligible percentage of homes had computers in 1980, but the portion reached 14 percent in 1984, and Future Computing projects it will hit 40 percent five years down the road.

Yet there is disquiet in the industry. Personal computerdom has its own equivalent of Big Brother—IBM, a corporate behemoth that already dominates the field and seems to be widening its lead. The operating system used by its machines has been accepted as an industry standard, so that software is most often written specifically for IBM machines, and competitors must make their machines work like IBM's or risk isolation. The company has followed the runaway success of its basic PC model with a series of new machines, some more powerful and some less. As an indication that even the biggest firms must dance to IBM's tune, it's notable that AT&T designed its long-awaited first personal computer to be compatible with IBM's. The shakeout among computer makers, which began with the 1983 fall of Osborne Computer, continued in 1984, and some wonder if any firm can survive in view of IBM's dominance.

There really are two personal-computer markets. In the far more lucrative business market, "high-end" computers sell for more than $1,000, sometimes for as much as $5,000. It is here that more growth is expected, since such business applications as word processing, data filing, and spreadsheets have become almost required tools of the 40-million-plus "knowledge workers" in the country. This market gobbles up peripheral devices—including printers, disc drives, and modems to connect computers to phone lines. Business also is the main market for portable computers, the lap-size models small enough to stuff in a briefcase. Sometimes the little machines, like the new $3,000 Hewlett-Packard portable, have as much memory as a desktop model.

The home market, though larger in numbers, is more erratic. Future Computing predicts that the Commodore company will sell some 2.6 million of its home computers, most priced at about $200, in 1984, but other low-cost competitors have lost heart, including Timex, Texas Instruments, and Warner Communications, which sold its once-mighty Atari division. The Coleco Adam, a $700 computer-and-printer combo announced with much fanfare last year, has fizzled, plagued by talk of unreliable hardware.

The problem in the home market seems not to be bad technology so much as increasing skepticism about what computers can do for the average household. There are vague mutterings about "computer literacy" for children and, of course, there are games to play, but no one has figured out a way to make the machines as essential to the home as TV sets or telephones are.

The problem in the home market is one of skepticism about what PCs can do for the average household.

Apple Computer has done very well by packaging its over-$1,000 Apple II series for small-business as well as home uses. On the day it introduced its sleek IIc model, Apple sold dealers 50,000 machines. But despite a huge ad campaign, even giant IBM failed to penetrate the home market with its under-$1,000 PCjr. After months of dismal sales, IBM finally upgraded the machine with a better keyboard and more memory, directing it to a more business-oriented market.

TECHNOLOGY: The most talked-about machine of 1984 was Apple's Macintosh, introduced in January. In many ways, the unprecedented Macintosh hoopla was justified, since the small desktop machine was an artful leap forward in terms of user ease. Employing a "mouse" (a palm-sized control device for choosing options and moving the cursor around the screen), quickly recognizable "icons" to point to, and "windows" of data on the screen, the Macintosh previews the way computers will operate in the next decade. Its operating system is the only one that stands a chance of keeping a foothold in a market dominated by IBM computers and their clones. Already available is software that makes IBM and compatible machines operate in a Macintosh-like fashion.

In other 1984 developments, the traditional improvements continue. People buy their computers with more memory—most get their IBM-PCs with 256 kilobytes of memory, up from 64K, which was common when the PC model first appeared (the Macintosh wasn't considered a "real" computer until its memory was boosted from 128 to 512K). New machines also operate at higher speeds made possible by new microprocessor chips, and sell for lower prices. Though 1984 was to be the year the flat screen replaced the display tube, a shortage of screens

from Japan postponed that boom. Anyway, their liquid-crystal displays, like the ones in the new lap-sized portables, are hard to read without ideal lighting. Better to wait for costs to come down on clearer "plasma" display screens.

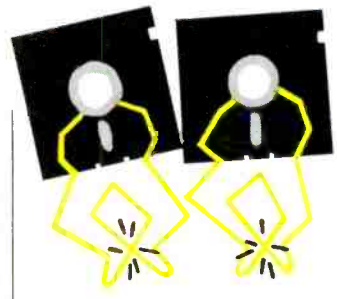
Among peripheral devices, letter-quality printers are getting cheaper, formerly fuzzy dot-matrix printers are improving in quality, and the new, under-$5,000 "laser" printers are churning out text as quickly as a photocopier. Customers increasingly are turning from floppy discs to higher-capacity hard discs that can store thousands of pages of information at a time.

In the next few years, we can expect machines to take full advantage of microcircuitry, especially in the area of graphics. Already there are rumblings about computers selling for less than $1,000 that will deliver the power of a Macintosh, which now goes for almost twice that price. And all competitors of IBM will be forced to push the state of the art even further to give the consumer more than the considerable value offered by the "safe" choice of an IBM machine. But for computers to become a mainstay of the American home, someone has to figure out what they can do for homemakers and kids.

STEVEN LEVY

COMPUTER SOFTWARE:

. . . AND EVERYBODY DANCES



It has long been recognized that designing and producing a personal computer are only the first steps in making a machine worth its price. It is then up to software authors to write the computer code to make the machines useful or entertaining. While it takes two or three years to bring a new personal computer to market, the technology's complexities are such that after six or seven years software authors are still finding ways to make the machine perform new tasks. A perfect example is the Apple II, now performing tasks not dreamed of when it was designed in 1976.

Of course, the effort involved in writing software is justified only for programs that will run on popular computer models. Some software companies have suffered huge, sometimes fatal, losses when they have put their resources into developing great software for unsuccessful machines. For example, more than a few companies found themselves in trouble this year by publishing software for the disappointing IBM home computer, the PCjr.

But because IBM dominates the business market, software developers have found a standard to rally around, and have used that relative security to design innovative programs. The classic story is that of Lotus Development Corporation, the first software publisher to integrate a computer spreadsheet, a database, and a business graphics system into a single program. Lotus's "1,2,3" allowed users to construct a ledger sheet from their files and then format the information into an attractive graph. The success of "1,2,3" went hand in hand with the acceptance of the IBM-PC computer, and now some people say that Apple's business-oriented Macintosh machine will not be a competitive piece of hardware until it runs a version of the Lotus program. As one industry observer put it, "The software tail wags the hardware dog."

MARKETPLACE: Software for home and business represented a $3.6 billion market in 1984, according to Future Computing Inc. Almost two-thirds of that figure came from business software, in part because those packages generally cost from $100 to $1,000, while software for home use runs between $30 and $70. High profit margins are possible in the software business because the software medium—the floppy disk that contains the computer program—is so inexpensive. That, combined with the willingness of potential buyers to pay large sums for business software, has created a highly competitive scramble.

So far competition has led not to severe price-cutting, but to better technology, added features, and, increasingly, high-powered marketing. The independent software companies that vaulted from obscurity to prosperity in the early 1980s have had to spend millions of dollars developing new products and then advertising them lavishly, even on network television. Two competing products, Lotus's "Symphony" and Ashton-Tate's "Framework," had a high-priced TV commercial shootout during the 1984 summer Olympics. Computer firms now spend so much to advertise software and hardware—$3.1 billion—that they're the fourth ranking category of advertiser, as well as the fastest growing.

Not surprisingly, bankruptcies were endemic in the software world in 1984. When the software doesn't catch on, as was the case with VisiCorp's "VisiOn," or the software isn't ready to ship on schedule, the company often goes out of business. This happened when a much heralded software package called "Ovation" was released too late. Before it was ready to come out, competitors had surpassed its technology.

Meanwhile, the billion-dollar software market was drawing powerful new players, particularly book publishers, among them Simon & Schuster, Pren-

Giant publishers are charging into the software market, even though many entrepreneurs are losing their shirts.

WRITING ON A DIVINE BLANK SLATE

The personal computer is a multipurpose machine that endows homes and small businesses with the power of computing. This "microcomputer" is controlled by a small, complex web of circuits on a silicon chip, the "microprocessor." Every other part of the computer—the keyboard, the video monitor, the disc drives, and the printer—receives and sends information through that chip. Taken together, these components, the computer's hardware, are useless without direction from software, or computer programs.

Software consists of computer codes stored most commonly on flat "floppy discs." The relationship between computer hardware and software is precisely that existing between a stereo system and audio cassette tapes. There are few limits to what software can make a computer do. The designers of the first microcomputers had only the haziest idea that their "itty bitty machines" would soon be running word processors, sophisticated accounting and mathematical modeling systems, vividly animated games, and even advanced medical testing equipment. The microcomputer is a divine blank slate, waiting for software artists to extend its capabilities.

There's only one real king of comedy.

The incomparable Johnny Carson in the most hilarious, timeless moments from "The Tonight Show." It's pure comedy... from an American comedy institution!

130 fast-paced half-hours.

CARSON'S COMEDY CLASSICS

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tice-Hall, and McGraw-Hill. These companies have been more than willing to pay the promotional costs necessary to sell their products. Also notable was IBM's decision to publish dozens of programs, evidence that "Big Blue," as the computer giant is called, wants to dominate software much the way it dominates hardware.

But even the winners among the software publishers have had to ask themselves where the gravy train will stop. Those selling video-game software to the home market have already found that there is a limit to the amount of software Americans will buy, and that limit is easily reached. Belt-tightening, layoffs, and bankruptcy have been commonplace, and the lesson has not been lost on software firms.

TECHNOLOGY: The strength of the software field is the consistent creativity of the wizards who design the programs. Each year they make it easier for computer owners to do more and more demanding tasks. A major trend is toward the integrated software system—one that contains within it, on a single floppy disc, several programs for different tasks. Such software allows an executive to keep tables of figures, try out different numbers on a spreadsheet, make handsome charts to present the numbers, write some paragraphs with a word-processing program, and then send the whole creation by electronic mail to a colleague in another city. The sections of the program are so well integrated that when the user changes a figure on the spreadsheet, the chart changes as well, and both can be made to appear simultaneously in subdivisions, called "windows," on the display screen.

The new integrated programs operate with a smoothness and friendliness almost unimaginable a few years earlier. Apple's Lisa and Macintosh computers embody these advances in their hardware design as well as in their software. But software developers have learned to write programs that enable hardware of older design to ape the Macintosh's abilities.

Then there are those who use the computer's power to come up with valuable applications that could not have existed before. The electronic spreadsheet was the first and most stunning example of this. A more recent example is Living Videotext's "Think Tank," an outlining tool that allows one to organize thoughts more effectively. Some say the newest breakthrough of this kind is Telos Software's "Filevision," a database program for the Macintosh that operates by visual cues.

The newer home software is characterized by better graphics and a more amiable way of communicating with computer users. Publishers, notably a firm called Software Publishing Corporation, have introduced moderately priced "personal productivity" applications that lack a few features of high-powered business word-processing, database, or spreadsheet programs, but are easier to use and do almost as much. Even the low-priced Commodore has its share of powerful applications.

Entertainment software continues to grow in sophistication. While shoot-'em-up games seem to be fading, more complicated "role-playing" and "adventure" games are being developed by young companies such as Infocom, Sir-Tech, and Origin Systems. True to the marketing-oriented trend, many of these are lent commercial credence by tie-ins to popular science-fiction novels or movies. So we see video games based on *Ghostbusters* and *A Hitchhiker's Guide to the End of the Universe*, and a series of games co-written by the likes of Robert Heinlein, Ray Bradbury, and Michael Crichton.

Companies in the growing educational software market are applying the same combination of spiraling innovation and aggressive marketing. Playing on the concern of parents who wish their progeny to be both "computer literate" and entertained, they are creating programs that far surpass the genre's arithmetic-drilling origins. The companies are now offering colorful simulations that make learning a nearly addictive experience for those fortunate kids whose parents can afford the computer and the $40 programs.

STEVEN LEVY

ELECTRONIC MAIL:

WHEN THE MEDIUM IS THE MESSENGER

Much of the mail sent electronically is dry, businesslike stuff—purchase orders, memos, bills—but as the practice grows in popularity there will be greeting cards and other personable items to dispatch as well. Hallmark Cards, for example, already has valentines and other illustrated electronic messages that customers can order for a dollar or two through videotex companies.

Only a few hundred thousand Americans use any of the various on-line messaging schemes. But experts foresee 40 percent of the population using electronic mail by 1990—sending 10 to 20 billion pieces annually.

Like other new-tech terms, "electronic mail" (or e-mail) is still being defined. Strictly speaking, it means computer-to-computer communication. In practice, however, the message may travel electronically most of its distance, and a courier ultimately delivers it in printed form. Some people define e-mail broadly enough to include telex, Mailgrams, and even voice messaging, which leaves an audio recording at the other end of the line. Whether the message is intended to be printed out or listened to, it is stored in the recipient's electronic "mailbox" until he's ready to check the mail. And since e-mail makes it so easy to reach multiple addresses, the same message may arrive in many mailboxes, junk-mail style.

One appealing aspect of electronic mail is the way it integrates with other communications services. It can be sent by some videotex terminals, by a home computer, or even by an electronic typewriter. The big e-mail carriers also offer access to Dow Jones data, the AP news wire, and airline timetables.

Each of those carriers—MCI, Western Union, Federal Express, and various computer timesharing networks—works somewhat differently. MCI Mail (which has built up a list of 110,000 customers in its first year) offers several options. One customer can send a three-page letter to another for $1. If the recipient doesn't have a computer and an MCI Mail account, the message is printed out at a nearby MCI office and sent the rest of the way by Postal Service (for $6) or by courier (for $25).

Federal Express, aware that its original jetliner service is faced with faster, electronic competition, has jumped into e-mail with its hybrid service, ZapMail. Couriers pick up and deliver the message in printed form (within two hours), but it travels between cities electronically—as many as five pages for $35.

Another big name in mail, the U.S. Postal Service, also had a fling with e-mail. Its E-COM service, which had only 950 users nationwide after two-and-a-half years of operation, was terminated in 1984. It lost nearly a dollar on every piece of mail.

The voice-mail variation on e-mail is an elaboration on the familiar telephone answering machine. In one version, the phone company's computer answers the recipient's phone, playing a digital recording of his voice. The computer records the incoming call, which can be retrieved at the recipient's convenience.

Critics of e-mail note some shortcomings. If the electronic mailbox can hold only, say, 20 items, new transmissions could be rejected and (unknown to the sender) never received. There's also the danger that recipients will forget to check their mailboxes until the habit becomes ingrained.

GARY ARLEN

The U.S. Postal Service flopped with e-mail, but a number of private carriers are speeding it along.

OPTICAL VIDEO DISC:

THE LASER'S EDGE

Suppose you were a driller on an offshore oil rig, and your partner was severely injured. Could you keep him alive till the helicopter arrived? He'd stand a better chance if you had a "First Responder" cabinet, which contains not only some frequently needed medical supplies, but also a trained first-aid instructor. The instructor is on a video disc.

Say you've lost your way while driving. Imagine consulting a dashboard video screen that shows your exact location on an electronic map as well as the best route from there to your destination. It's not science-fiction. Chrysler has been demonstrating just such a system, using maps stored on a video disc and navigational signals beamed down by satellite.

Closer to home, interactive video discs are hawking Cuisinarts in department stores, cataloguing pretty faces for modelling agencies, and simulating science lab experiments for college students (thus confining any explosions to the television screen). The Smithsonian Institution is even offering a $30 disc containing 100,000 pictures of airplanes. But be warned: If you linger even one second over each plane, it will take you more than 27 hours to view them all.

TECHNOLOGY: Such interactive uses are the specialty of the optical video disc, pioneered by Philips and MCA, which became the de facto technical standard for discs when RCA gave up on its competing capacitance disc format in April 1984 (see box). The RCA disc not only failed to win the mass-market success expected by the company, it also technically lacked the optical disc's greater capacity to carry interactive material.

Acceptance of the optical disc format has been reflected in introductions of new disc players by Hitachi and TEAC, as well as Pioneer, the major maker of optical disc players, and in Sony's plans to open a video-disc pressing facility in the United States.

Video-disc players can be expected to find their way into more American homes as manufacturers introduce new dual-purpose models that can play both optical video discs and their smaller audio cousins, the super-hi-fi digital compact discs. The two recording technologies appear to be converging, as methods are developed to record video on the audio discs, and digital audio on the video discs.

New equipment also brings the video-disc player into the orbit of the personal computer. Interfaces for disc player and computer now cost less than $100, and special decoder boxes permit use of the disc as a vast data bank for the computer. The decoder can give a computer access to a billion characters of data per disc, or video or audio material in digital form.

Video-disc players may prove more popular as they connect with digital audio discs and PCs.

MARKETPLACE: In the home market, the video-disc player has been left in the dust by the video-cassette recorder, which has outsold it by about 80 to 1. But the consumer market grows steadily, if slowly, and the number of players is expected to top 200,000 by early 1985 and one million in 1987. However, partly because they have no way of recording off the air with their machines, disc-player owners buy a lot of prerecorded discs. Cassette sales outnumber disc sales only 10 to 1. Companies are going after the teenage market with new eight-inch video discs, each containing four or five rock video clips for $10.99. And some of the new video-jukeboxes in up-to-date taverns will have the Karaoke feature wildly popular in Japan: The lead vocal is missing, enabling would-be stars to belt out lyrics appearing on the screen.

While the video disc's consumer market has grown slowly, the industrial market is shaping up as its brightest prospect. Firms like Digital Equipment Corporation and AT&T do a great deal of employee and consumer training with video discs. IBM offers courses on discs at more than 150 learning centers. And the military is planning training systems based on video discs, which may make Uncle Sam the biggest user of discs.

Still more people will use video discs in information kiosks at such chain stores as Wards, K-Mart, and Sears. At some kiosks, customers may even be able to insert credit cards and make purchases on the spot for later delivery. Ironically, this may eventually help the disc amass the huge audience its backers have sought for so long, but the disc will be so thoroughly hidden in the selling apparatus, the shoppers won't know they've just used one.

ROCKLEY L. MILLER

PERIPHERAL BUT POWERFUL

Practically in its sleep, the 12-inch record with the rainbow sheen can reel out a movie with high-quality pictures and sound. But the optical video disc doesn't begin to approach its potential until it's teamed with a small computer.

More sensationally known as the laser disc, the optical disc makes a perfect peripheral storage device for a computer because its information, like that of a computer's floppy disc, is laid out on the fast-spinning surface of the disc, handy for random access. That information can consist of up to 108,000 individual still frames, enabling the disc to function as a video encyclopedia. The computer and disc can also team up to do an uncanny imitation of an untiring tutor or a persistent salesman, responding to the viewer's questions tapped into a keypad.

Unlike the floppy disc, however, the optical disc doesn't store its information magnetically. Instead, its images and sounds are physically pressed onto the plastic disc in microscopic pits. A low-power laser beam is reflected onto those pits as the disc rotates at 1,800 revolutions per minute, and the beam is interpreted to produce a video image.

The optical video disc now has a little cousin developed for top-quality audio recording—the five-and-a-quarter-inch digital compact disc (CD) that's currently emptying the pockets of stereo buffs around the world. Lasers are used to play both kinds of discs, but the smaller audio CD is encoded differently—in a computer-like digital format rather than the analog format used for video discs.

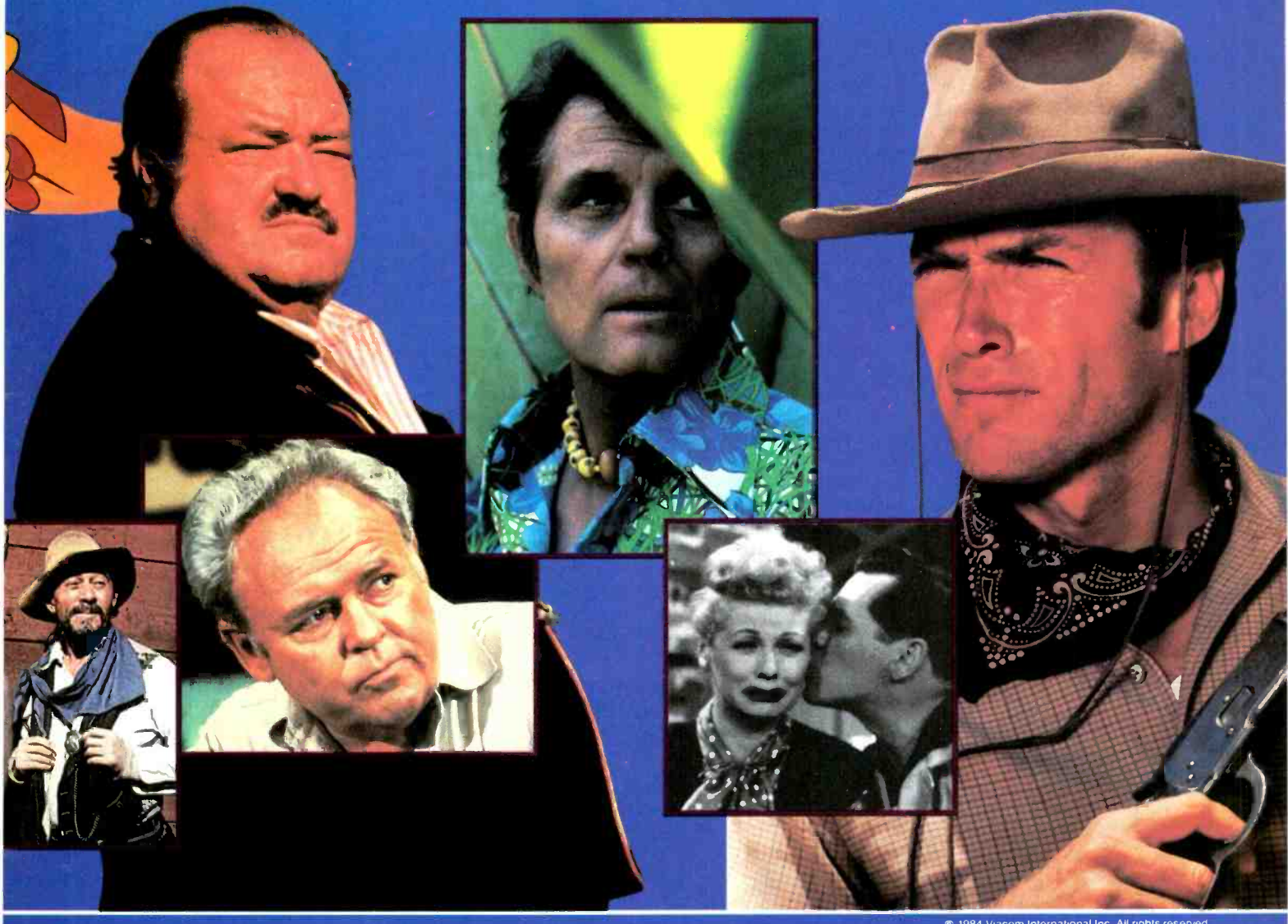
RCA's now-defunct capacitance video disc was encoded in still another format and played by means of a stylus instead of a laser.

IF YOU'VE GOT THE TIME.

Whether it's morning, noon or night, the one company more stations turn to for programming is Viacom.

So if you want to make the most of *your* time, turn to Viacom. We'll show you how to capture virtually any audience in no time at all.

PROGRAMS...



Tandem Productions

All in the Family
The Bob Newhart Show
The Beverly Hillbillies
The Honeymooners
The Twilight Zone
The Mary Tyler Moore Show
I Love Lucy
My Three Sons
Family Affair

Hogan's Heroes
The Wild Wild West
Have Gun Will Travel
The Millionaire
The Phil Silvers Show
Trackdown
The Dick Van Dyke Show
Marshal Dillon
The Rookies
The Andy Griffith Show

Gomer Pyle–USMC
December Bride
Perry Mason
Clint Eastwood in Rawhide
Hawaii Five-0
Gunsmoke
The Life and Times of Grizzly Adams
Cannon

Petticoat Junction
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VIDEOTEX:

SHIFTING FROM KEYPAD TO KEYBOARD

Still very young, the medium of videotex may be maturing into a creature quite different from that originally conceived. It was to be an electronic newspaper, delivering information at the bidding of subscribers using special keypads. Now it appears that videotex may do a lot more for people than bring textual information to their TV screens. And it may do it all using subscribers' home computers instead of a special keypad/decoder attached to their TV sets.

The videotex parade is picking up its pace as blue-chip companies join in. Most eagerly anticipated is the debut in 1986 of Trintex, the new videotex service jointly owned by CBS, IBM, and Sears. RCA is planning a home information system. And two newspaper titans, Knight-Ridder and Times Mirror, are recruiting publishers and other firms around the country as local affiliates for, respectively, their Viewtron and Videotex America networks.

MARKETPLACE: The first commercial videotex service, Knight-Ridder's Viewtron, got off to a slow start in Miami during 1984, falling far short of its first-year goal of 5,000 customers. In Chicago, the Keycom and Gateway services delayed their start-ups briefly, underscoring the reality of high-tech's erratic rhythms and high costs. Recognizing that a big investment is needed to start operating a videotex system, firms like Gannett and Hearst are instead developing electronic databases they'll sell to operators.

Videotex companies have also recognized a burgeoning market among computer owners, and no longer rely entirely on customers using single-purpose videotex terminals. IBM and AT&T have unveiled software that lets a personal computer serve as a videotex terminal. Keycom is offering a special all-text version of its videotex service that can be received by any home computer with a modem and a $60 software package. Trintex is apparently among the firms that plan to use videotex to deliver ("download") computer software to subscribers' computers. And firms like CompuServe and The Source that for years have provided databases for computer buffs are now calling themselves "videotex" operators. (Their plain-vanilla services are as fact-packed as ever, although they lack the colorful illustrations common in videotex.)

Until videotex becomes a mass medium, its promoters are encouraging its use by smaller publics, installing screens in kiosks in shopping centers and tourist spots. Some companies are building internal videotex systems to disseminate information among employees and to supplant printed catalogues.

TECHNOLOGY: The developers of videotex have always prided themselves on the moderately detailed, if still cartoonlike, multicolored graphics they can transmit along with text. Now AT&T and others are developing new techniques, including a photo imaging system, that offer detail approaching photographic quality. However, the method used to "paint" the picture on the screen often requires a minute or so—demanding more patience than many viewers have.

Technicians are also working to bring down the price of single-purpose ("dedicated") videotex terminals. Although viewers with their own personal computers can do without such terminals, some industry experts believe there will still be a market for simple decoders in many homes. Among Japanese firms, Panasonic continues to lead the way toward developing a $500 terminal. One scenario for the future of videotex suggests that

Videotex companies see a whole new market for their services in the growing number of computer households.

VIDEOTEX

Videotex and teletext transform the TV set into an information-age appliance. Both allow the viewer to push buttons on a special keypad to select information from a central computer, and receive it on the screen in textual ("alphanumeric") form, often with illustrations. But the two media are different in the ways they are transmitted and in their information capacity.

Videotex is a two-way interactive medium that connects a home TV set or personal computer by wire to a central database in a large computer. The wire is usually a telephone circuit, but can also be a two-way television cable. In effect, videotex is a simplified version of computer timesharing, in that it allows thousands of individuals to call up data from the vast memory of a central computer. Information was to be the basic commodity delivered by videotex, but home shopping and

& TELETEXT

banking services may become more important features.

Teletext, in contrast, is a one-way medium that delivers information by piggybacking on television broadcasting. It gives the impression of being an interactive medium because it allows the viewer to choose certain "pages" of information among about 100 that are being broadcast in a cycle. Teletext is transmitted by "inserting" digital data into a few lines of the usually unseen vertical blanking interval (VBI) of the television picture. (The VBI is that heavy black line that bobs into view when the TV set's vertical hold needs adjusting.)

Videotex is generally supported by monthly subscriber fees or per-minute fees. In contrast, many planners assume that teletext will be supported by small advertising messages on the information pages.

TELETEXT:

THE UNRECEIVABLE BROADCASTS

Teletext is in 73 million American homes," a television network executive boasts. The problem is that only a few hundred people know it's there.

Since spring 1983, CBS, NBC, and a handful of local TV stations have been pumping out news, sports, weather, business reports, and advertising on colorful teletext pages. But in a classic chicken-and-egg conundrum, all that material remains unseen because there's no manufacturer mass-producing the decoder needed to grab the material off the air and display it on the screen.

There are two main obstacles delaying teletext's development: the rivalry between two incompatible technical formats for broadcasting it, and the high cost of decoders.

Each of the rival teletext formats has its adherents: CBS, NBC, and some of their affiliates have endorsed the North American Basic Teletext Specification (NABTS), similar to Canadian and French systems. At the same time, Metromedia, Taft Broadcasting, Storer, and Group W have adopted the so-called World System Teletext (WST) format, based on British technology.

With that technical issue unresolved, manufacturers have been unwilling to mass-produce the decoders or build them into new TV sets. The bold exceptions have been Zenith, which is selling WST sets in limited markets, and Matsushita, which has worked with CBS to offer NABTS decoders in cities such as Buffalo, Charlotte, and Los Angeles, where CBS affiliates have launched local teletext service. The decoders are expensive, though: $300 and up. Even the most avid teletext devotee thinks the price must drop to $50 or less before teletext will be widely used.

Three or more times daily since May 1983, NBC has updated its teletext service, including the index from which viewers can choose news briefs to read.

Until these problems are solved, teletext will be unable to deliver the large audience needed to attract substantial advertising, which is considered to be the most promising means of supporting this new medium.

Understandably, broadcasters are in no hurry to leap into teletext. A survey by the National Association of Broadcasters found that only about 7 percent of television stations have put teletext on their agendas.

While teletext for the general public languishes, several companies are planning to use the vertical blanking intervals (see box) on television channels to broadcast stock market figures and other private data to subscribers with personal computers, bypassing costly telephone networks. Broadcasters are also finding ways of using the medium to reach the public away from home: in kiosks in public places during the Los Angeles Olympics, and at the New Orleans Worlds Fair.

Deals are in the works to bring down the price of decoders and put them into more TV sets. But a legal skirmish between broadcasters and cable operators threatens a longer-term problem. The FCC ruled in 1983 that when cable systems retransmit a TV channel they don't have to keep its accompanying teletext signal. If cable systems commonly strip out broadcast teletext, the impact on audience, advertising, and the survival of teletext could be devastating.

GARY ARLEN

TV stations are likely to be cool to teletext until a single technical standard is adopted and the price of home decoders comes down.

Japanese electronics companies, stymied in their efforts to crack the U.S. personal computer market, may see dedicated videotex terminals as an attractive alternative.

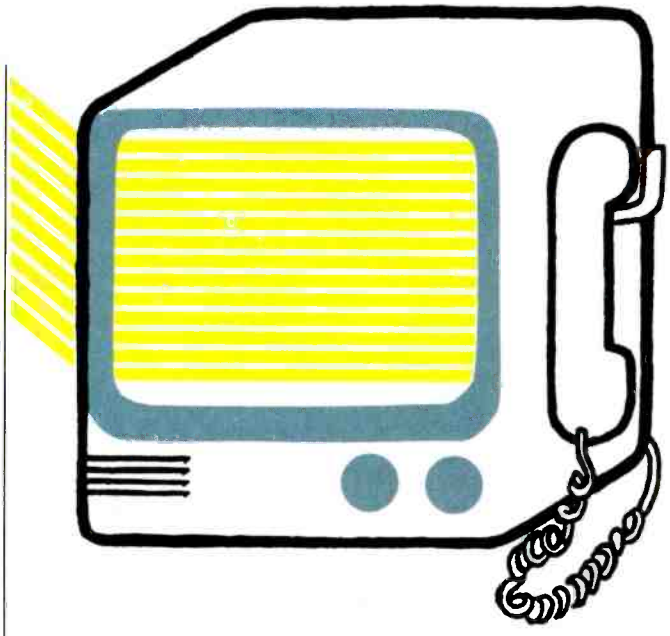
REGULATION: Some of the tribulations of videotex stem from chaos in the telephone and banking industries, both of which are becoming deeply involved in the medium. The phone companies, for example, had envisioned electronic Yellow Pages, but clashed with the newspaper industry, which feared losing advertising income. The final court order on the Bell System breakup banned the former AT&T phone companies from the electronic publishing business until 1990.

As videotex becomes widespread, new political uproars will arise, involving home banking services, and the issues of privacy and security associated with them. The Federal Trade Commission, Securities and Exchange Commission, and several bank regulatory agencies are mounting investigations on the impact of interactive videotex services, but action is not imminent.

GARY ARLEN

INTERACTIVE SERVICES:

TELEPHONE NOW COMPLETES THE CIRCUIT



Cable television didn't manage to deliver the bank, the shopping center, or the voting booth to the nation's living rooms in 1984. Seers and cable boosters had promised that two-way interactive cable would make such services as home banking and home shopping available to any household with cable service. That promise probably will have to be kept by the oldest appliance of the information age—the telephone.

MARKETPLACE: The biggest recent blow to cable television's largely unkept promise was Warner Amex Cable's wholesale retreat from its commitment to the interactive Qube technology. With an eye on profitability—and after a change of management—the company started 1984 by announcing it couldn't afford to build the two-way system it had promised in Milwaukee. (Later in the year, the city government approved the cutback.) The company sold its system in Pittsburgh, meaning the end of interactive service there. And the company also stopped its nightly 90-minute satellite feed of interactive programs to the six cities with Qube systems. Qube would continue operating locally, Warner said, but only for pay-per-view movies, special polling, and interactive commercials.

What Warner's pullback meant to two-way cable can be seen in the numbers: Of the 400,000 to 500,000 American homes wired for two-way cable, roughly two-thirds are served by Warner's Qube systems.

It's clear that 1985 won't see many franchise bidders hawking two-way cable. Also unlikely will be services that use cable systems to transmit ("download") computer games and other software. Companies with such aspirations, including the NABU Network, the Games Network, and Playcable, have encountered severe financing problems, and have either stalled or cancelled their plans.

Amid all this gloom, Link Resources market analysts see hope in the growth of so-called hybrid systems, which use cable to bring information into the home ("downstream") and telephone lines to send consumers' commands and messages back ("upstream") to the cable transmission center. By 1990, such hybrid services will reach eight million homes, compared with only 3.5 million for two-way cable, Link predicts. Industry executives agree with the assessment. Warner Amex vice president Scott Kurnit believes the next generation of Qube will use telephone lines to swim upstream. Qube pioneered a concept of interactivity that isn't wedded to any particular technology, he says.

One company that figures to be a player in hybrid services is Integrated Communications Systems, a consortium that includes such big boys as Bell South and Control Data Corporation. In Roswell, Georgia, the consortium is running a six-month, 200-home trial of a hybrid system that controls home appliances, delivers information, and allows shopping and banking from the home.

Many interactive services have been identified in the public mind with cable, but they never really needed it to get going. Consumers can do their banking or stock trading from home, using personal computers hooked into a telephone line. In New York, Chemical Bank's Pronto home-banking service has more than 10,000 subscribers using their home computers to pay bills, transfer funds, and buy and sell stock. More and more banks will start up home banking in 1985, some as features of a broader videotex system.

Sears, a retailing giant carving out a place for itself in the financial services business, has already started a service that lets customers pay all their bills (to Sears and other companies) by telephone, and has let it be known it wants to move into home banking.

TECHNOLOGY: To a consumer, the first obvious difference among interactive services is the type of hardware used. Warner stationed a $200 keypad in every home using Qube. Such services as Pronto and E.F. Hutton's Huttonline require that the user own a computer. Subscribers to videotex services must use special terminals like AT&T's $900 Sceptre. Knight-Ridder's Viewtron service already found consumers less than eager to spend that kind of money to use videotex.

John Lockton doesn't think it's necessary to use such complex hardware, and he should know. Lockton has been around the block on this subject more than once, first as president of Warner Amex, and now as Pacific Telephone's marketing chief. "The two friendliest things in the home are the telephone and the TV set," he says. Let the customer tap in his instructions on a Touch-Tone phone's keypad, and receive information over a TV set hooked to a cable system. "Without requiring as much equipment in the home, you really open up the mass market."

RICH ZAHRADNIK

The Qube concept of two-way television isn't wedded to any particular technology. The new form is a hybrid of cable and telephone.

FROM SUNRISE TO SUNSET.

NBC NEWS AT SUNRISE
WITH CONNIE CHUNG

NBC NEWS TODAY
WITH BRYANT GUMBEL AND JANE PAULEY

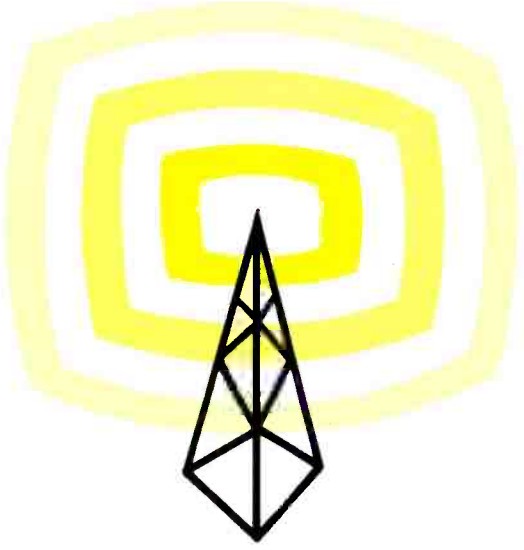
NBC NIGHTLY NEWS
WITH TOM BROKAW

AROUND THE WORLD. AROUND THE CLOCK.

NBC NEWS

BROADCAST TV:

MAKING MONEY THE OLD-FASHIONED WAY



"All program sources will face one underlying reality," CBS said in a presentation a few years ago. "People do not watch cable or pay cable or networks or stations or satellites or STV or MDS or discs or cassettes. They watch *programs*."

And no segment of the television economy has profited more from faith in the power of programming than commercial broadcasters, who—despite dire predictions to the contrary—have found themselves in a growth industry.

Broadcast television's 1984 revenues, according to Television Bureau of Advertising estimates, exceeded $18.8 billion, with the three networks sharing $8.2 billion of the total, and individual stations the remainder. Gross revenues increased by 17 percent—on top of a 17 percent gain the previous year and 12 percent the year before that. The networks are so healthy that stock market analysts are criticizing them now for underplaying their hands.

Anyone wanting to buy into the boom would discover that stations in the 10 largest markets cost upwards of $200 million —assuming that any would even be for sale. Wometco Enterprises, owner of four TV stations and an STV operation, was bought by a Wall Street holding company in 1983 for $842 million; the same group bought KTLA in Los Angeles for $245 million, a record price for one station.

An even surer sign of broadcast television's good health, and the optimism it engenders, is the rush to put new stations on the air in markets once considered too small to support an independent TV outlet. The rise of independent television occurred in the five years between 1978 and 1983—the very years in which new-tech alternatives to broadcast television were getting top billing. At the end of 1978 there were 93 independents in the United States; five years later, 193. The number will exceed 215 in 1985 and should continue to grow by about 25 stations a year for several years.

The principal force behind this new surge is the same old force: mass-market, common-denominator programming in an endless stream—from old *Cisco Kid* reruns to the latest doings on *Dynasty*. Ironically, the new distribution systems that were supposed to be fearsome competitors of broadcast television—cable, satellites, and VCRs—have contributed importantly to its growing prosperity.

Cable, because it is required to carry all local television signals, has put UHF independent stations on nearly the same footing as local VHF affiliates, vastly improving their reach and reception. It has expanded the markets for established independents by giving them wide dissemination as "distant signals" on cable systems and has created a broadcast/cable hybrid—the superstation. Satellites have given stations instant connections to programming sources and advertisers, permitting the creation of ad hoc networks and regionally distributed commercials.

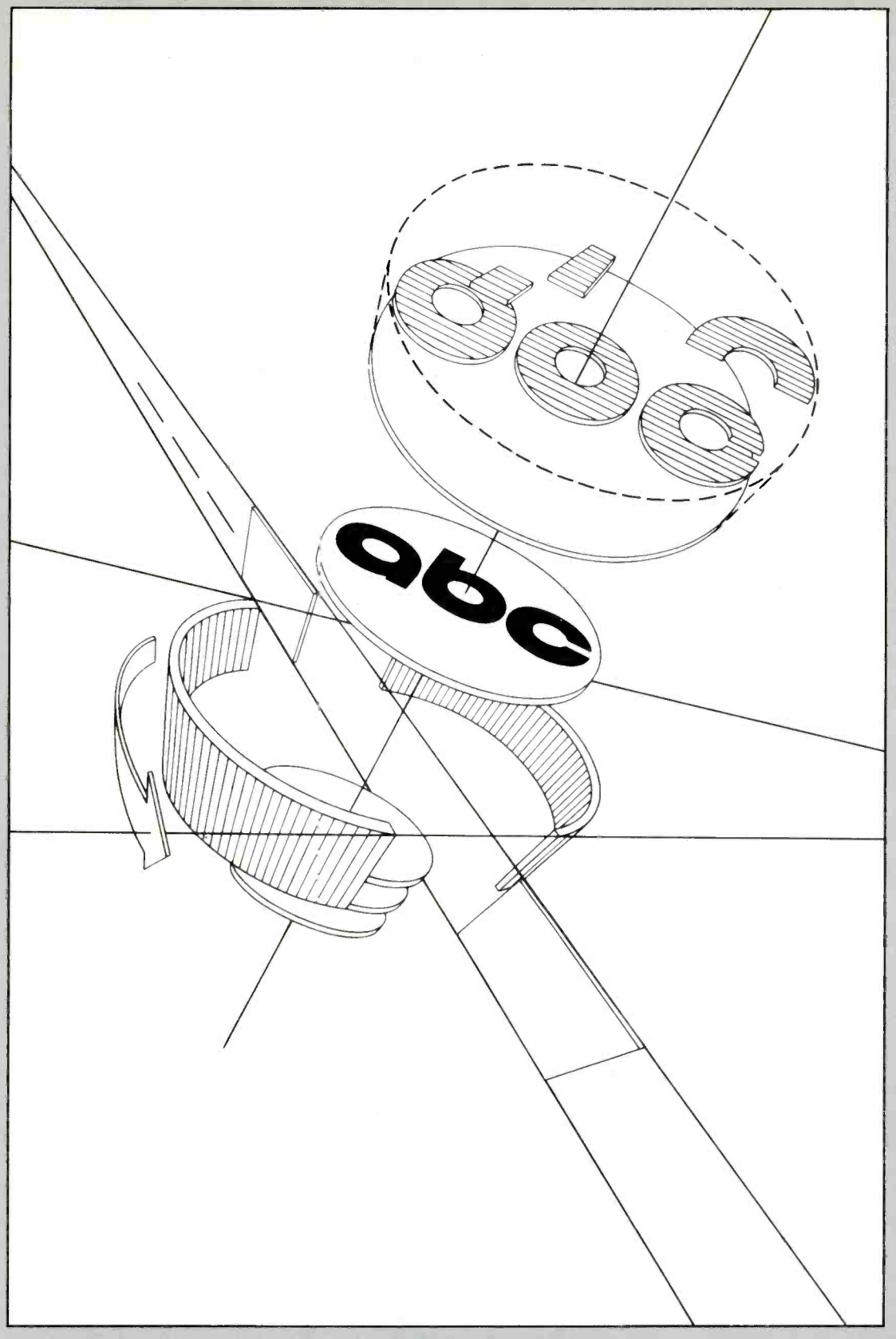
As for VCRs, they are used largely to record programs off the air for later viewing: A 1984 Nielsen study found the number one use of recorders to be "time shifting" the networks' afternoon soap operas.

MARKETPLACE: Broadcast television's permanent advantage in the marketplace is its reach—99 percent of American households can receive it either over the air or on cable. No other program service can be received both ways. And cable can give broadcasters only limited competition for audiences: Only about 40 percent of the nation's households have cable, and even the most popular cable networks aren't available on every system.

The well-publicized decline in network audiences over the last five years has been traced to the rising appeal of independent stations and pay-cable services, and only minimally to competition from the ad-supported cable services. At the present rate of erosion, the three major networks collectively will attract, by the end of the decade, between 50 and 70 percent of the prime-time audience, down substantially from the 90 percent shares common in the early '70s.

The loss of audience has not yet affected the networks' revenues because they still dominate national advertising and can keep up their ad rates. However, the networks are being squeezed by rapidly rising production costs. A single

Since programs are what matter, the large and wealthy established system has the edge on all competitors.



We're With You

ABC ENTERTAINMENT

one-hour episode of a lavishly produced prime-time series can cost as much as $750,000 today, and that figure is expected to reach $1 million in a year or two. Inevitably, the profit squeeze will lead to cost-cutting measures, such as staff reductions, coproductions with foreign companies, and an even greater reliance on tried-and-true kinds of programming.

Complicating matters is the growing interest among advertisers in targeting their commercials to specific audiences. This is where cable has an edge, since broadcast television, by its nature, is a medium for general audiences.

REGULATION: The strained relationship between the major networks and their Hollywood program suppliers became hand-to-hand combat in Washington when the Federal Communications Commission, bent on deregulation, proposed to scrap the so-called Financial Interest and Syndication rules. These are the regulations that keep the networks from owning the programs they buy from the studios and engaging in program syndication. In a bitter fight to retain the rules, which they contend are all that keeps the networks from dominating television completely, Hollywood lobbyists took their case all the way to the White House and won at least a temporary moratorium. Hollywood also lobbied successfully against the FCC's decision to permit broadcast companies to increase the number of television stations they were permitted to own from a maximum of seven to a new limit of 12. Again the argument was that it would allow the networks to grow more powerful.

Except for such setbacks, however, broadcast deregulation has proceeded rapidly under the Reagan Administration. The FCC has removed the time limits on commercials for both television and radio, eliminated the minimum requirements for news and public-affairs broadcasts, and relieved stations of the obligation to keep program logs for public inspection. It also did away with the policy statement that set guidelines for children's television.

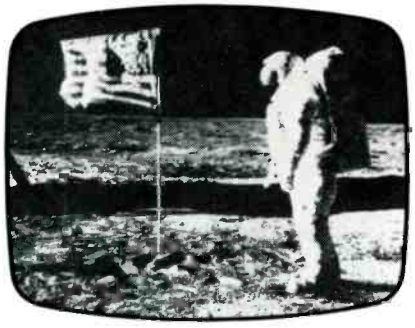
Public-interest advocates argue that, under chairman Mark S. Fowler, the FCC has been drifting away from a concept that has stood for half a century—that broadcasters are public trustees. Indeed, the commission seems determined to pursue deregulation all the way to the point of eliminating the cornerstones of regulation, the Equal Time Rule and the Fairness Doctrine. To date, Congress has been unwilling to go that far.

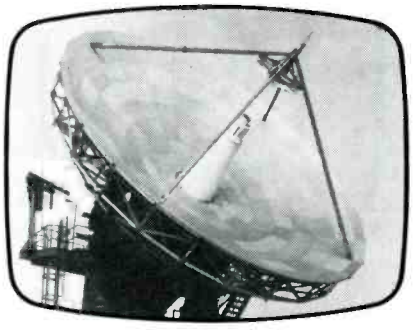
The rationale for deregulation at the FCC, at least in part, is that broadcast television now faces so much competition in the marketplace that it should be allowed to compete freely, unhindered by a set of outmoded government rules. The commission continues to hold this belief even as broadcast television racks up another record year in the face of all the competition.

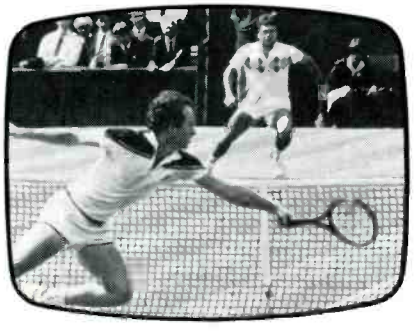
BEN BROWN

TELEVISION

A 13-part series on the history of a revolution







In 1949 there were 6 million television receivers around the world.

Today there are 465 million.

producer/directors Mike Beckham, Brian Blake,
Phil Casson, Leslie Woodhead

programme co-ordinator Mike Murphy
executive producer Norman Swallow

coming soon from Granada Television of England

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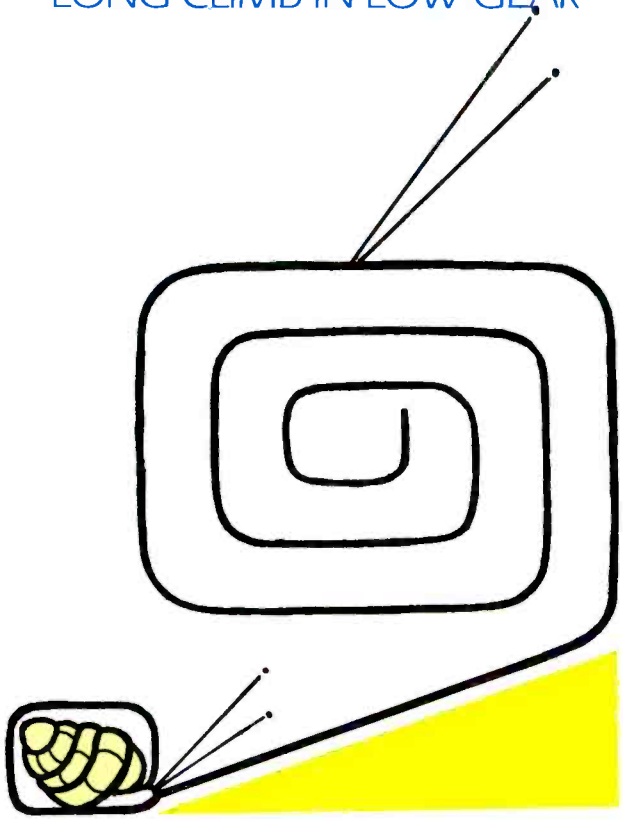
LPTV:

LONG CLIMB IN LOW GEAR



In the late 1970s, Charles Ferris, then chairman of the Federal Communications Commission, promoted low-power television (LPTV) as a noble concept, an alternative to the all-too-mass media. After a gestation period considered long even by the FCC's pokey standards, low-power is finally emerging as a reality, town by town. But it seems to have lost some of its nobility along the way. Ferris had envisioned LPTV as a haven for minorities, women, and offbeat programmers. Although much of this spirit remains, today's low-power operators bear an increasingly striking resemblance to orthodox broadcasters.

MARKETPLACE: Construction of low-power stations, which have a broadcast radius of no more than 10 to 15 miles, started in earnest after the FCC began its series of monthly license lotteries in September 1983. Among the thousands of applicants were not only small minority-run businesses but such large concerns as Gene Autry's Golden West, Federal Express, and Sears. Many had been encouraged by the statement of Ferris's successor, Mark S. Fowler, that low-power would be best utilized by large new networks, which could benefit by economies of scale. Some applicants saw opportunities for subscription television in LPTV.

By late 1984, there were more than 260 low-power stations in operation (three-fourths of them in Alaska)—still too few for the emergence of sizable networks. Most are in small towns like Cumby, Texas; Concord, Virginia; Plainview, New York, and Bemidji, Minnesota, where the first LPTV station was established in 1981. They're small, but not cheap: The average start-up cost of an LPTV station is estimated at $350,000.

Many of the new stations have found that the local programming and bold innovations once expected of LPTV are too expensive to serve as regular features. The president of the Bemidji station, John Boler, built a first-class studio for original programming, and then found he couldn't turn a profit with local advertising. Boler eventually converted his station to subscription TV. Other owners have mixed some homemade news and talk shows with generous helpings of network reruns.

The cost of programming, new and old, is only one of the problems pioneer operators have had to face. Doug Maupin, president of the Woodward, Oklahoma station, found problems with both viewer-supported and advertiser-supported programs: The decoders he had installed for pay-TV were so well protected against signal piracy that he could not get them to work at all. And when he tried ad-supported programming he couldn't scrounge up enough local advertisers to keep his studios busy making commercials. "Main Street," he says, "hasn't got that kind of money."

Rick Hutcheson is starting up three stations of his own. As a "group" owner with some leverage, he doesn't worry so much about the eventual supply of programs. But he does worry about getting his stations on the local cable systems, which are not required by law to carry low-power stations. Cable operators are beginning to argue that adding an LPTV signal to their systems could expose them to liability for extra royalty payments. Hutcheson is taking the issue to Congress. "In the long run," he claims, "there's a symbiotic relationship between cable and LPTV. Cable carriage is a must for low-power TV."

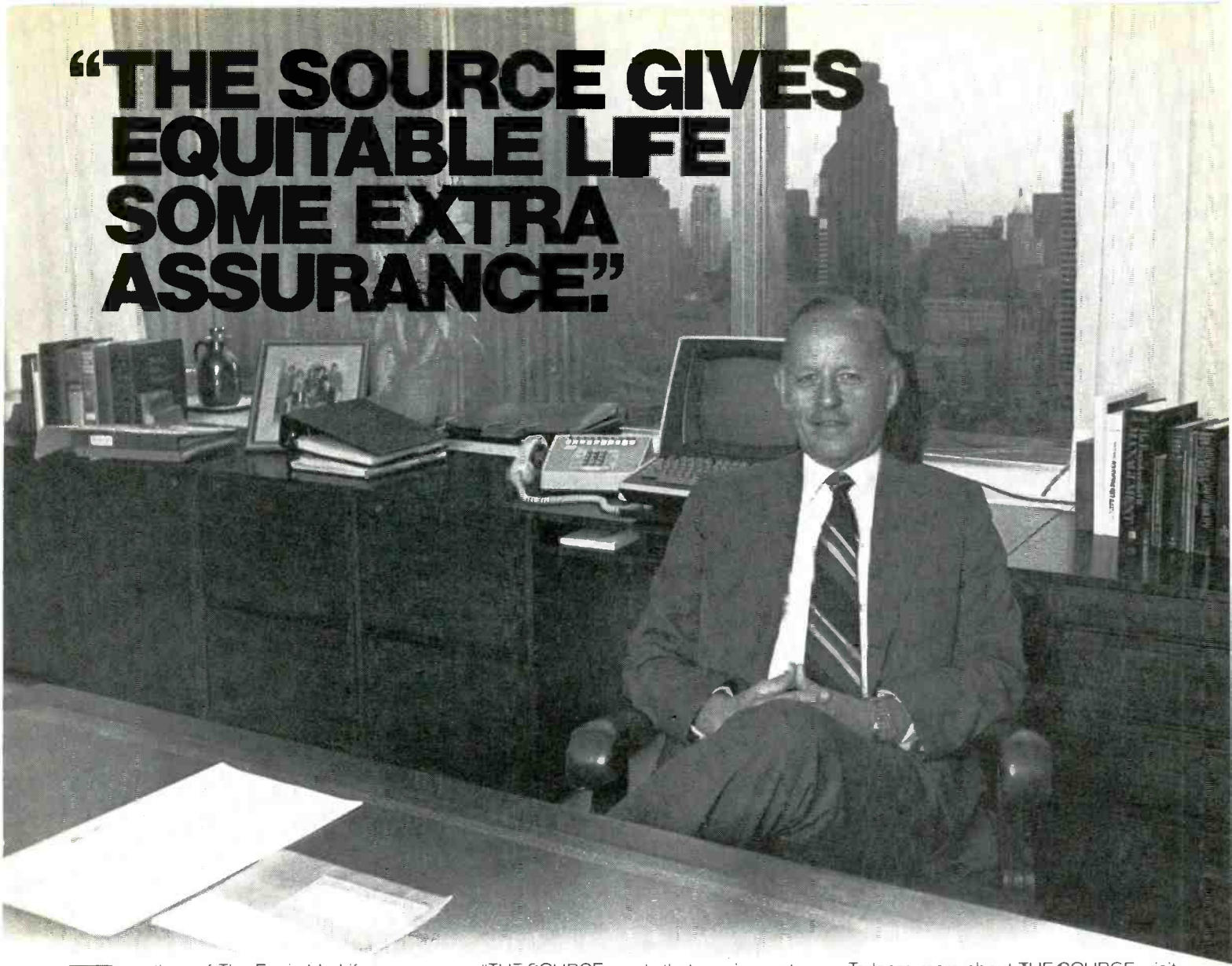
In the process of learning some painful lessons, LPTV operators have also found some keys to success.

While LPTV operators have learned a number of painful lessons, they have also discovered some keys to success. Hutcheson shrewdly recruits young local sales people who, all else failing, will gnaw on a merchant's leg to sell some air time. Another key is adequate capital. Viewers expect professional production values, so programs don't come cheap. And since viewing habits don't change overnight, operators must be able to wait at least two years before seeing a profit. A few companies, including Low Power Technology Inc., in Boulder, Colorado, have issued public stock to gain capital prior to construction. The Boulder firm has sold more than $2 million worth of shares.

REGULATION: One thing on which virtually all LPTV operators and would-be operators agree is that the FCC has not helped their cause. More than 40,000 LPTV applications have arrived at the FCC over the last four years, and a backlog of 25,000 is still inching towards the lottery. Only about 25 construction permits are being issued per month. As of November 1984, 275 applicants in the continental United States had received permits but had not yet built stations.

Despite the problems, potential LPTV operators refuse to be discouraged. Some applicants are guaranteeing themselves a license by paying their competitors to drop out. By this measure of confidence, Charles Woods, a veteran broadcaster, is brimful of hope. Woods had an application pending for a low-power station broadcasting from atop the Sears Tower in Chicago. He won his construction permit by buying out his opponents—for $750,000. MICHAEL COUZENS

"THE SOURCE GIVES EQUITABLE LIFE SOME EXTRA ASSURANCE."



Executives of The Equitable Life Assurance Society know they can get the information they want, when they want it. Not only do they have their own in-house telecommunications service at corporate headquarters in New York—they have THE SOURCE.

Chairman of the Board Robert F. Froehlke is part of the growing movement toward personal use of computers by senior officers of Equitable, one of the nation's largest insurance companies.

"This technology is as new to me as anyone," Mr. Froehlke says, "and believe me, it has to be friendly if I'm going to use it!

"THE SOURCE meets that requirement and, as a supplement to our internal network, gives me and other officers immediate access to valuable information, right at our desks. That includes research data, airline schedules and industry news, all of which we can retrieve with key words.

"THE SOURCE also helps us become more comfortable with personal computing. We're glad to have it at our fingertips—and that's what I call hands-on management!"

With its wealth of information services and one of the world's most sophisticated, easy to use electronic mail systems, THE SOURCE can work for your company too.

To learn more about THE SOURCE, visit your computer dealer. Or telephone or write us for a subscription application and information package. THE SOURCE is compatible with all major personal computers, terminals and communicating word processors.

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BUSINESS

Regularly updated business news ● Stock and bond prices ● Commodity news and prices ● Investment advice and analytical tools ● Employment opportunities ● Legislative reports and analyses ● Financial modeling and accounting programs

TRAVEL

Airline schedules ● Hotel, restaurant, and entertainment guides ● Weather advisories ● Make travel, hotel, auto reservations direct from your desktop terminal!

NEWS AND SPORTS

Search by subject for the latest worldwide, national or state news stories ● General business, sports news and features ● Daily Washington, D.C. schedule of events ● Hundreds of business magazine article abstracts

GAMES

Dozens of challenging electronic games and puzzles

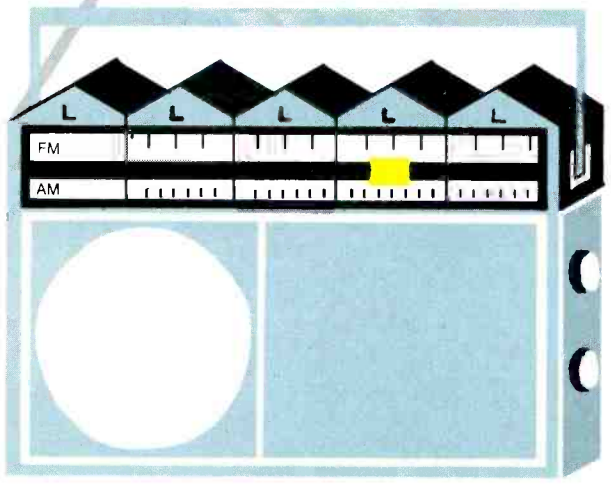
CONSUMER SERVICES

Movie and television previews ● Book bestsellers and ordering ● Electronic discount shopping ● Consumer tips ● News and advice about personal computing

THE SOURCE has been named the Executive Communication Service for the U.S. Council of the World Communications Year.

[sm]A service mark of Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc.
THE SOURCE information and communication services are offered in participation with Control Data Corporation.

RADIO:
THE GREAT SURVIVOR



Radio is not only the oldest of the electronic entertainment media, it is also the most flexible. Radio has adapted to competition from movies, records, and television, and recently, cable, home video, and the Walkman. Today there are more radio stations, formats, program suppliers, and networks drawing larger total audiences and profits than ever before. Revenues have consistently grown by 10 to 15 percent in each of the last five years. According to Arbitron figures, radio now reaches 96 percent of all Americans 12 years and older during a typical week, with an average tune-in time of 25 hours per person—only five hours less than television.

But now radio must adapt to a new set of internal pressures—the proliferation of stations, decline in AM listeners, and increased competition from financially powerful media. The industry is essentially an odd assortment of small- to medium-sized businesses (receiving three-quarters of their revenue from local ad sales). Few stations have the financial resources that television broadcasters or big cable operators can pour into programming and promotion. The resulting experimentation has produced a dizzying turnover in formats, personnel, and promotional strategies.

MARKETPLACE: With more than 10,000 stations on the air (9,000 commercial and 1,300 non-commercial), formats have become more and more specialized, targeting ever-narrower demographic groups. This endears radio to advertisers, who realize that television, even in the cable age, can never afford to specialize as effectively as radio.

Predictably, as the "baby boom" generation gets older and more affluent, advertisers—and therefore radio stations—are competing more aggressively for its attention. Fewer stations are catering to teenagers (Top 40) and seniors (beautiful music and news/talk). Contemporary hit radio, meanwhile, has become the hottest format. CHR, as it is known in the trade, is an upscale version of Top 40, relying heavily on punchy jingles, fast-talking disc jockeys, and frequent repetition of popular songs by artists as diverse as Lionel Richie and Bruce Springsteen. Album-oriented rock, the format associated with the heyday of '60s music, has gone into decline. Country music, the hardy perennial, remains the staple for the largest percentage of stations.

The rock format has split into dozens of variants, as have other music genres, such as country and black-oriented. Stations are also reacting to the enormous popularity of music videos, simulcasting television concerts or music-video programs.

The younger generation has virtually abandoned AM for the high fidelity and music emphasis of FM, though new techniques for broadcasting AM stereo may come to its rescue. At present AM stations have been left to specialize in news, talk, religion, and ethnic fare.

Cost pressures and competition have forced some small stations to cut staff and reduce expensive services, such as local news. Satellite-delivered networks, providing polished announcers and up-to-date music selections for a fraction of a staff disc jockey's salary, have been the salvation of many struggling outlets. Barter syndicators are lining up as many as 700 similarly formatted stations, giving them free programs in exchange for some of the commercial time.

TECHNOLOGY: Radio networks and many syndicators have completed the transition from costly landlines to inexpensive satellite transmission. At least 20 nationwide networks, dozens of regional syndicates, and scores of specialized program services are now available to the station with a satellite receiver. Program directors can "cherry-pick" particular music, news, features, and specials that match the station's image.

Radio has been adapting to change for 60 years. Now it must deal with new media and a flood of new stations.

The FCC's deregulation of subcarriers—the part of the station's signal not received by ordinary radios and thus unused—has created an entirely new business for stations. Many of them, especially powerful FM outlets, are leasing out their subcarriers for city-wide transmissions of paging signals, data transmission, and energy-saving remote control of home hot-water heaters.

REGULATION: In 1984 the FCC continued its radio deregulatory process, begun in 1981, by raising the limit on the number of stations a single company could own, from seven AM and seven FM to 12 of each. The pace of station trading, as expected, has quickened. The biggest radio chains will probably get bigger, although the FCC still restricts group owners to one AM and one FM outlet per market. Other decisions made last year should add some 650 new FM stations, increase the power of others, and allow daytime AM stations to broadcast at night as well.

AM stereo continues to make slow progress, owing in large part to the commission's refusal in 1982 to select a standard from among five incompatible AM stereo transmission systems. The competitors thus chose to slug it out in the marketplace. Since then, Motorola's C-QUAM system has gained the support of auto makers and receiver manufacturers, while some broadcasters are encouraging promotion of multi-mode radios capable of receiving the four systems still on the market. Although some 300 AM stations now transmit in stereo, the new receivers have not yet appeared in significant numbers. This and a lukewarm listener response have discouraged many radio operators who believed the innovation would stem the exodus of listeners to FM.

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CABLE TV:
THE TOUGH GET GOING

A couple of years ago, the press flashed the word that cable television's blue sky was falling. In the bleakest scenarios, the bold vision of a wired nation was expected to fall victim to new over-the-air means of bringing television into the home. Indeed, cable had hit economically hard times, and a shakeout was at hand. Promises made to cities during the gold rush days of franchising were met head-on by the harsh economic realities involved in building cable systems and providing programs that attract subscribers.

In reaction, the industry has made important adjustments, tightening its belt, concentrating on marketing, and cutting expensive services. Aided by FCC and court decisions that undermined the authority of municipalities, cable also negotiated a major deregulation act that Congress enacted in October 1984.

Amid all the turmoil, however, cable has passed a new landmark in subscribership: There are nearly 6,000 cable systems serving more than 83 million subscribers—40 percent of the nation's television households.

MARKETPLACE: Despite the economic squeeze, industry revenues have hit $7 billion. Cable went from a $200 million loss in 1982 to an estimated $800 million profit for 1984, according to Daniels & Associates, the major broker in the sale of cable systems. But there have been casualties.

Warner Amex Cable, parent of the renowned Qube interactive systems, made huge staffing cuts, sought to reduce services, and sold some systems, including its Pittsburgh franchise. And Storer Communications, one of the leaders in the rush for franchises, sold many of its systems to pay its debts. Consumers have suffered too, as public-access channels and extras such as videotex have been cut back in some communities.

Some companies, however, didn't overreach and have been successful. The largest multiple-system operator, Tele-Communications Inc., has bought up franchises cast away by other companies and has started packaging programs centrally for its systems. Many systems in small and medium-sized markets are said to be doing well with modest numbers of channels.

And operators intend to stay financially healthy by avoiding ambitious bids to build systems in the big cities. High costs have frightened the biggest multiple-system operators (MSOs) away from major markets, leaving some cities looking hard for qualified bidders. In the 10 largest television markets, 65 percent of homes are still without access to cable, according to the National Cable Television Association (NCTA).

Programmers of national cable

WIRING FOR ABUNDANCE

Cable television wasn't born in a laboratory, as most other communications technologies were. It began in the late 1940s as CATV (community antenna television), a practical way of bringing better TV reception to remote and hilly areas. Cable's explosive growth came after 1976, when Home Box Office began distributing its movie service by satellite. Suddenly cable had something of its own that city-dwellers would want to buy.

More than half of today's cable systems date from those earlier days when they carried 20, 12, or fewer channels. Newer systems have 35, 80, or even 120 channels, bringing a video cornucopia into the home: basic cable channels supported in part by advertisers, premium channels supported by additional subscriber fees, public access channels with programs produced by the people of the community, and the so-called "must-carry" channels, which are the local television stations the FCC requires a cable system to carry. Where the systems are specially equipped, they also provide interactive services such as burglar alarms and videotex information banks.

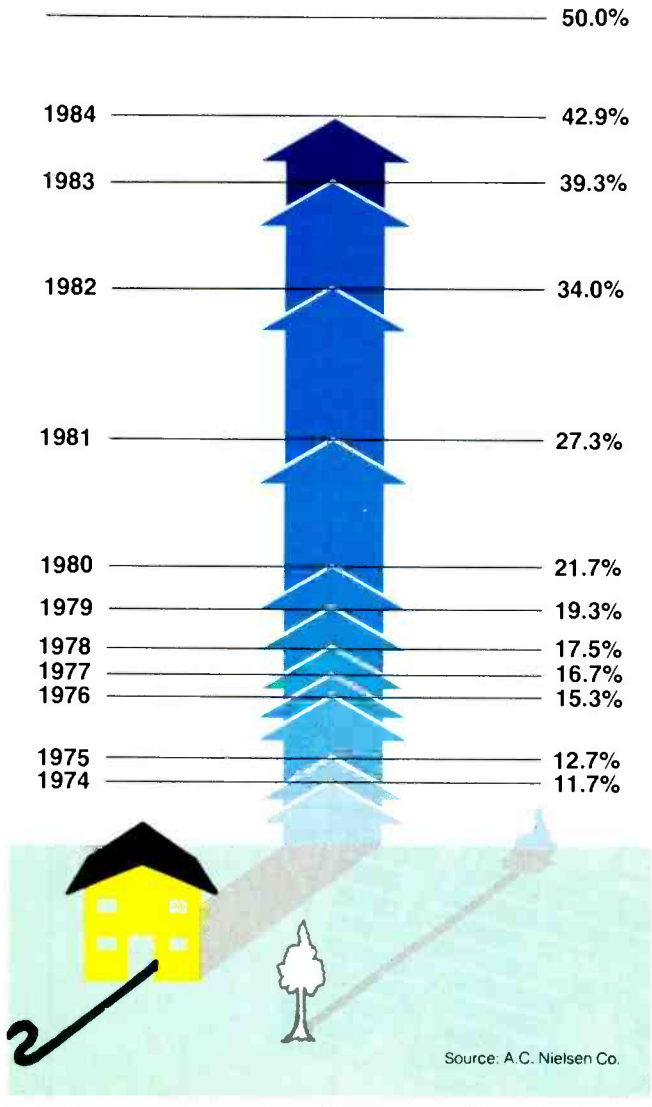
In each system, programming is received at the operator's "headend" from satellites or regional microwave links, or picked up off-the-air from local television stations, and sent on to subscribers' TV sets through coaxial cable strung along poles or through underground conduits. The channels are carried on a broad band of frequencies contained in the cable, which is shielded both to keep them in and electrical interference out. Often the cable operator installs a separate cable, an institutional loop, to bring non-entertainment programs and computer data to schools, other civic buildings, and businesses. In modern systems, cable channels come into the TV set through a converter box having buttons or knobs for channel selection.

In most areas, the city, county, or state government gives a cable operator a multi-year monopoly franchise to serve a certain region. The government usually issues a request for proposals, and companies compete to get the franchise.

Operators, to stay healthy, are avoiding expensive urban installations; meanwhile, two-thirds of the largest cities are still without access to cable.

CABLING THE NATION

(Percentage of TV households that subscribe)



channels today are reluctant to test new waters, having witnessed the quick, costly deaths of high-brow ventures like CBS Cable. Instead, they're jumping onto bandwagons that are already rolling. Three more channels featuring music video clips are adapting MTV's successful formula. With a stay-the-course attitude, superstation WTBS and the SPN, CBN, MTV, and Nickelodeon services have become profitable. Analysts say others, including Ted Turner's two news channels, will soon show profits.

Cable operators continue to be wary of potentially damaging competition from new over-the-air television distributors, such as low-power television, multichannel MDS, and direct-broadcast satellites, but most of those *wunderkinder* are busy dealing with their own economic difficulties. The new favorite of many viewers, and the greater threat to cable, is home video—in particular, the video-cassette recorder. The VCR boom threatens to make it less profitable to wire some communities that are still without cable. And in already-wired areas, low-priced cassette rentals may prompt some VCR owners to drop second- or third-choice pay services. To make matters worse, the cassette business is now getting the first crack at new movies, beating out services like HBO.

Cable operators don't need new challenges like the VCR. Some must pay off enormous debts incurred in building systems. Lowered interest rates may help, but cable must regain Wall Street's confidence. Companies are preparing to wire major urban markets, including Baltimore, Detroit, Philadelphia, and Washington, where they plan to build modest systems so they won't lose their shirts. Some 215 cable systems have linked up, creating 23 regional interconnects to coordinate programming and the sale of advertising, according to a study by Link Resources. Advertiser-supported national channels such as the USA Network are striving to better assess the size and demographics of their audiences in order to earn more advertising revenue. Theft of cable service continues to be a multi-million-dollar problem, and the industry is pushing for tougher law enforcement to combat it.

REGULATION: According to some Washington lobbyists, cable profits will ultimately benefit from the Cable Communications Policy Act, which Congress passed in October 1984. The bill was a product of compromise between the NCTA and organizations representing the nation's cities. The industry won limits on what it regarded as regulatory burdens. Effective in two years, cities will lose the authority to regulate subscriber rates. (In most instances, basic-cable rates are expected to rise, while competition may result in lower prices for premium channels.) The new law virtually assures that cable franchises will be renewed so long as the franchise holder has "substantially complied with the material terms of the existing franchise," and offers to continue service that is "reasonable to meet the future cable-related community needs and interests." (Disputes over the meaning of that language are sure to take many a franchise dispute into federal court.)

Congress also relieved a recurring cable-industry nightmare, prohibiting future regulation of cable as a common carrier or public utility. (However, the bill dodged that question in regard to cable provision of two-way data or voice services.) And the law prohibits phone companies from providing video entertainment services over their own wires.

At the same time, the cities won provisions that give them clear authority to continue choosing operators for local franchises, and to collect a franchise fee of up to 5 percent of a system's gross annual revenues. On balance, however, the cities clearly lost ground in the compromise. They feared even greater losses of authority if negotiations had failed. Represented by the National League of Cities and the U.S. Conference of Mayors, the cities were forced back to the bargaining table by a Supreme Court ruling and two FCC decisions that undermined their authority over cable. In June 1984 the high court unanimously held that federal law preempted an Oklahoma law banning liquor advertisements on cable. And in the same year, the FCC issued rulings limiting cities' ability to regulate the local pricing and packaging of cable program services. If the cities hadn't agreed to bargain, the NCTA was prepared to use the precedents to push for deregulation at the FCC or in court.

CRAIG LEDDY

SMATV:

PRIVATE CABLE AT EASE

STEALING CABLE'S THUNDER

Take the ordinary master-antenna system built into modern apartment complexes, connect it with a satellite receiving dish to pull down signals from the national cable networks, sell subscriptions to tenants, and you have SMATV. When the FCC stopped requiring licenses for dishes in 1979, this suddenly became a quick and inexpensive way to create miniature cable systems. The entire system is contained within private property, and thus is not subject to most FCC, state, or local regulation.

Anybody with a string of initials—STV, MMDS, DBS, SMATV—seems to be gunning for the urban household. The "least sexy," according to cable expert Robert Morse, is SMATV. Only about half a million households receive television through "private cable," as it is also known. Yet throughout the last year the cards have been falling right for SMATV, and it seems likely to chart a path of steady, if unsexy, growth in 1985.

MARKETPLACE: Since SMATV essentially offers a smaller-scale version of cable television, its window of opportunity will remain open as long as cable fails to capture the big cities—a failure that grows more striking by the month. Residents of New York City's giant Co-op City apartment complex receive television through a private cable system, as do apartment dwellers in Dallas, Atlanta, and other cities. Though cable operators have vehemently objected to SMATV's unregulated status, multi-system cable operators have hedged their bets by building private cable systems.

Until recently, SMATV's growth had been hindered by the refusal of the major pay channels to offer their programming through private cable. But in June 1984 Showtime/The Movie Channel ended this boycott, acknowledging that SMATV had become a market force, if not a major one. HBO has also negotiated with at least one major SMATV system, according to R. Mickey Gorman, lobbyist for SMATV's trade group, the National Satellite Cable Association.

REGULATION: In the past year SMATV has depended on the kindness of strangers in Washington. Gorman describes beleaguered operators as "making it through the rain." In May 1983, a New Jersey superior court judge ruled, in a case brought by a cable operator, that an SMATV operator could not operate without a cable permit. The decision would have made SMATV subject to local governments' rate regulation, franchise renewal strictures, and other controls. But in November 1983 the FCC exempted SMATV from such regulation, a decision it reaffirmed in August 1984.

And then in October 1984 the Congress did private cable an even kinder turn. Until that time, H.R. 4103, the cable deregulation bill, contained a clause prohibiting private cable operators from striking exclusive agreements with apartment-complex landlords. The language went to the heart of the contest between SMATV and cable operators, since the latter felt they were being shut out of potentially lucrative areas, and argued that exclusive SMATV deals violated tenants' First Amendment rights. But after a display of political muscle, by the real estate industry as much as the SMATV industry, the clause was struck from the bill. (Nine states have such a law at present.)

Now that the regulatory and legal drizzle over SMATV has ended—at least at the federal level—Gorman sees sunnier prospects, both psychological and financial. Bankers who had been reluctant to extend credit to SMATV operators can now make loans with confidence. The operators themselves are now bigger and more financially secure. But somewhere in the deck is the wild card of cable's urban growth, and no one knows when it will turn up. JAMES TRAUB

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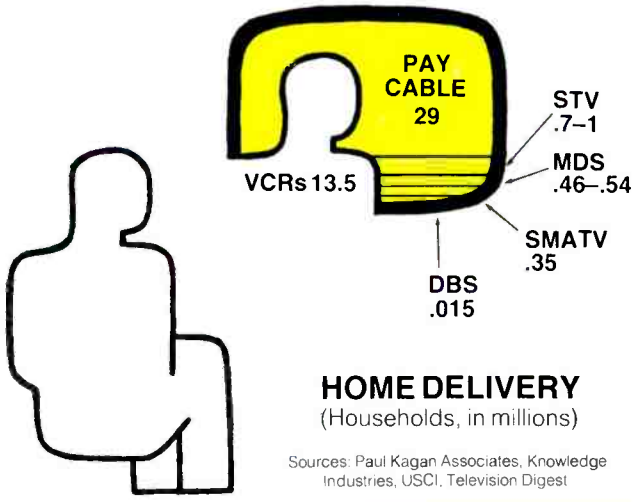

HOME DELIVERY
(Households, in millions)

Sources: Paul Kagan Associates, Knowledge Industries, USCI, Television Digest

Consumer interest in VCRs has hampered cable's drive to sell multiple pay channels to subscribers.

"Feevee" has never been a harmonious business, what with the various pay services grouping and regrouping in league with, or in opposition to, the movie studios that supply most of their programs. Now, however, the business has been shaken by the inroads made by an alien competitor—what Disney Channel president James Jimirro called "a klutzy piece of hardware."

The video-cassette recorder (VCR), along with the prerecorded cassette, offers what pay television cannot: the convenience of renting and watching a movie any time you want, and for as little as a dollar or two. In contrast, the pay channel may seem to repeat, endlessly, the movie you want to see, but not on the night you've set aside for viewing.

Growing consumer interest in the VCR has cut deeply into "tiering" or "multipay," the cable industry's dream of viewers subscribing to more than one pay channel at a time. The industry had hoped a subscriber would buy two pay channels, but the average has turned out to be 1.3, according to industry expert Paul Kagan.

There are already as many VCRs in consumers' homes as HBO has subscribers. The service is still king of the pay-TV mountain, with 13.5 million of the 29 million total subscribers, but the VCR and other problems have significantly hampered its growth. Pay cable's subscriber count was leaping 50 percent a year, four or five years ago, but is now growing only 15 or 20 percent a year, according to former HBO chairman Frank Biondi. Discontent in the upper reaches of HBO's parent company, Time Inc., ran high enough that Biondi was ousted in October 1984.

Outsiders linked the firing to an expensive gamble that HBO began taking several years ago—investing hundreds of millions of dollars in exclusive pay-TV rights for movies. In a series of deals (including co-founding the new studio, TriStar), HBO got exclusive pay-TV rights to about one-quarter of Hollywood's output. The second-ranking pay network, Showtime, spent some $400 million to buy its own exclusives from Paramount. But when HBO growth slowed down, the company began retreating from its "HBOnly" plan, giving up exclusives.

The competing channels have also tried to put distance between their schedules by commissioning original productions such as HBO's impressive feature *Sakharov*. Original productions are expensive, however, so the competing channels often find themselves carrying the same movies.

Subscriber disillusionment and the VCR were not the only impediments to growth for HBO and pay-TV in general. A slowdown of big-city cable construction "has clearly hurt," says industry analyst Alan Cole-Ford. "HBO had no reason to foresee the dramatic slowdown. But it has taken a great toll." Now the pay channels have another strategic decision to make, he adds. Will they stick to their original business—supplying pay channels for cable systems—or will they branch into new delivery systems? HBO, for one, is looking afield. Once its satellite feeds have been protected by signal scrambling, HBO is expected to begin offering direct-broadcast-satellite (DBS) service, for pay this time, to backyard-dish owners who have been picking it up free. Already, HBO is received by some two-thirds of MDS (multipoint distribution service) subscribers.

It's reasonable for programmers to look afield at delivery media other than cable. Prognosticators say many potential viewers will never get even a whiff of cable. Even by 1989, there will still be 21.5 million homes with TV sets not served by cable, according to the Yankee Group, a Boston market research firm. Those are prime customers for VCRs, but also for over-the-air pay-TV media. In rural areas, the theory goes, many will turn to DBS, and in urban areas, to multichannel MDS (MMDS) operators. Yankee projects five million DBS receivers in the field by 1990, and nearly four million MMDS receivers by the same time.

But those are only projections. ABC Video Enterprises surely had some statistical assurance when it chose Chicago as the pilot market for a new means of delivering pay-TV, called TeleFirst. The company transmitted recent movies during the wee hours using ABC's WLS-TV. TeleFirst subscribers were given decoders to unscramble the transmissions and feed them into their VCRs for recording. It seemed ingenious, but the system never gained public acceptance—or comprehension either, most likely. Six months after TeleFirst went on-air, ABC discontinued it, admitting losses of $15 million, and a final subscribership of just 3,000.

Pay-per-view television is also unfamiliar in most households, but it's the next stage in the evolution of movie delivery, according to Cole-Ford. "Over the next five years, pay-per-view will have just as pronounced an effect on home video as home video is having on pay TV." SETH GOLDSTEIN

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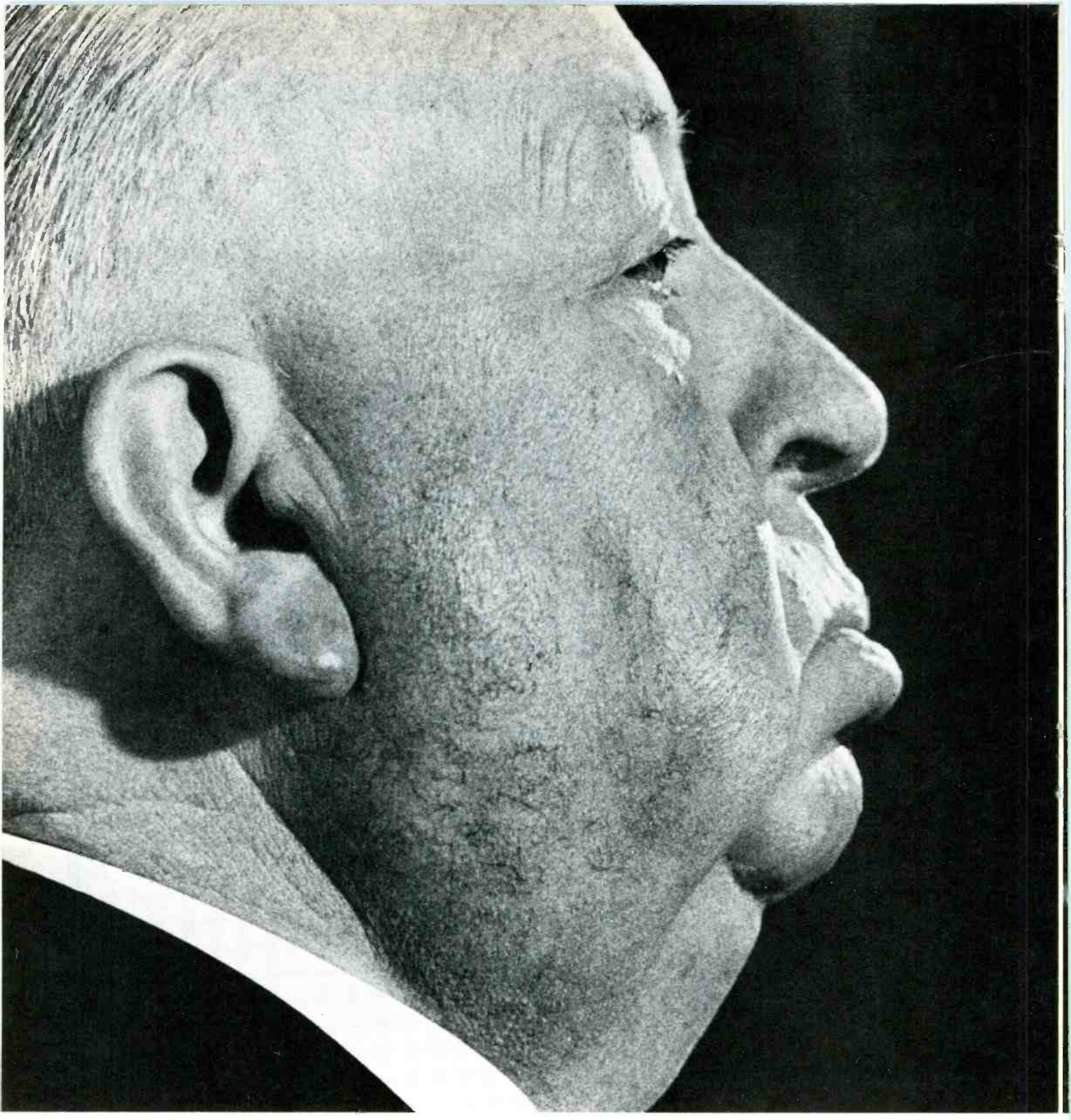

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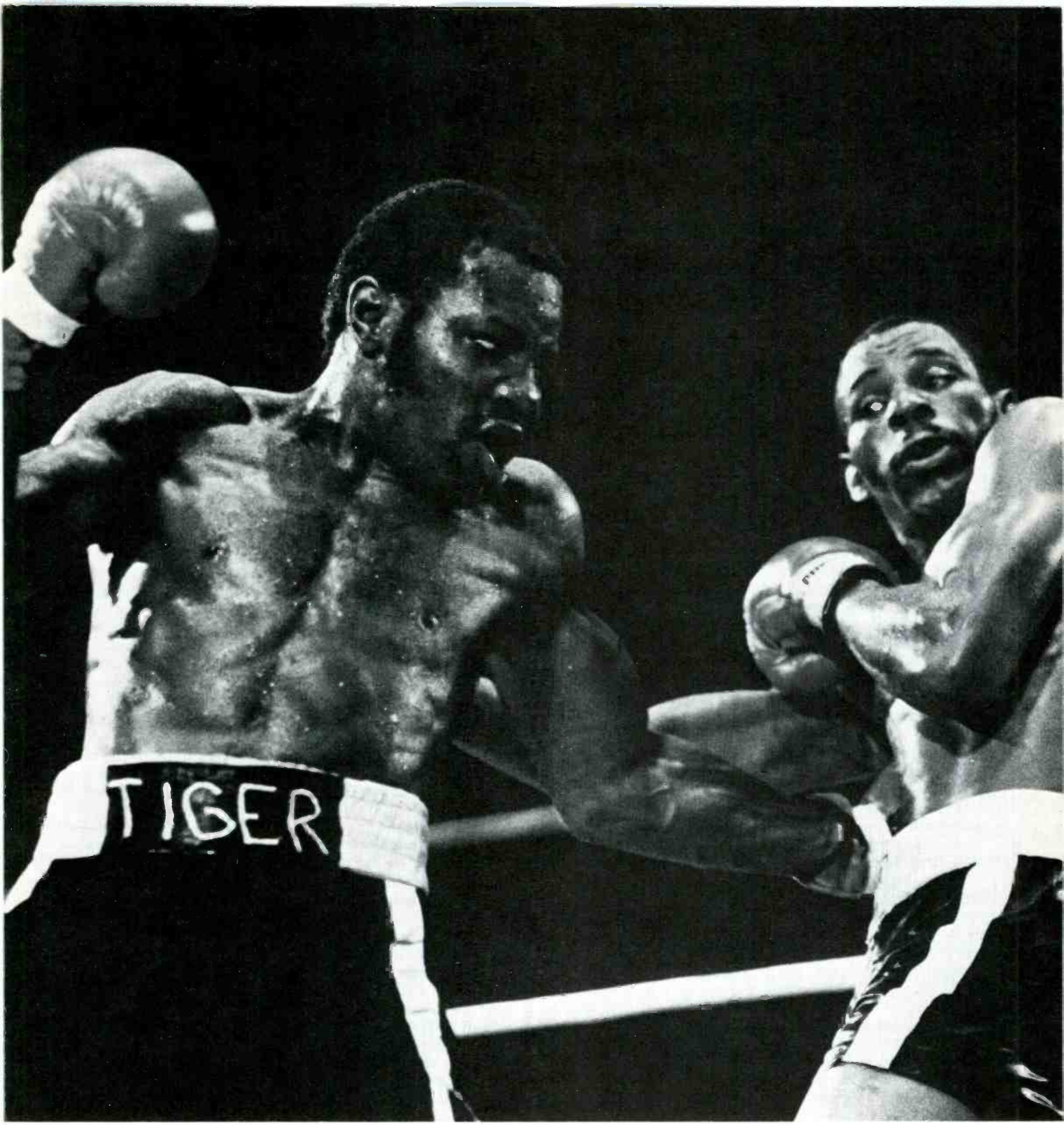

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STV:
DOWNHILL RACER

OLDEST OF THE NEW TECHS

STV (subscription television) is the oldest of the "new technologies" for television delivery. Held back by the FCC for many years to protect "free" commercial broadcasting, the service got going in the mid-'70s, when the FCC finally turned it loose. STV is simply pay television transmitted over the air by a local TV station that has chosen to support itself by selling subscriptions rather than advertising time. STV stations, most of which are on the UHF band, send out a scrambled picture that can be decoded by a device attached to subscribers' TV sets.

The "S" in STV is beginning to stand for "somnolent." Subscription television operators have been shutting down in a wave. Casualties during the last year include outlets in Tulsa, Miami, Milwaukee, and Dallas, bringing to at least 15 the number closed since 1982. Meanwhile, not a single major STV operation has been started in more than two years, and the number of subscribers has dropped to less than half of STV's peak count of 1.5 million homes.

Still among the survivors is Oak Industries' once-mighty ON TV. Formerly the premier player in the STV field, providing programming to 600,000 homes in the United States, ON TV has been reduced to only two STV stations, one in Chicago, the other in Los Angeles, with a combined reach of about 280,000 homes. Its losses in the first half of 1984 totaled $7.4 million. "The Los Angeles system is in the red, its subscriber count continues to dwindle, and it is in jeopardy of losing its major sports contracts," says Alan Cole-Ford, an analyst with Paul Kagan Associates.

Sports exclusives have always been a crucial part of STV's appeal—an offering that distinguishes it from competitors. The end of the 1984 baseball season, which marked the expiration of ON TV's broadcast rights to the Angels and Dodgers baseball games, may also have marked the beginning of the end for ON TV. While sports coverage has always been expensive (ON TV's sports contracts and production costs reached $10 million in 1983, Ford estimates), it is also the most popular programming the company can offer Los Angeles-area viewers.

The decline of STV is largely the result of competition from cable, which clearly has more to sell and at a lower monthly price. The fact that STV is a local service that can tailor its programming to the tastes of its market was expected to give it an edge over cable. "That is an idea that has always made sense on paper," but in the marketplace it hasn't proven out, Ford notes.

Among the problems plaguing STV are customers who don't pay their bills. In the industry's eagerness to expand rapidly and establish itself before cable arrived, many operators signed a lot of high-risk subscribers who subsequently had to be disconnected for non-payment. As if this weren't enough, many other viewers pirated the service without subscribing at all. Illegal decoder boxes have cropped up in large numbers time and again, despite continuing surveillance by the industry and law-enforcement agencies.

Finally, the increasing value of UHF stations has prompted their owners to drop STV and broadcast soap operas or music videos.

SETH GOLDSTEIN

PAY-PER-VIEW:
THE UNIVERSE EXPANDS SLOWLY

TV FOR THE IMPULSE BUYER

Pay-per-view technology permits users to pay for one-time viewing of a program, usually a sports event, film, or concert. The key to pay-per-view is "addressability." After a viewer orders a program, usually by phone, a computer in the cable office activates a box on the viewer's set. The box then receives and unscrambles the program signal on the viewer's pay-per-view channel. In the 400,000 homes equipped with two-way cable, the viewer can order a program merely by pushing a button on a keypad, rather than phoning the cable company.

Pay-per-view television (PPV) finds itself in the situation of the poor young man waiting to come into his inheritance: The future looks bright, but awfully far away. Entrepreneurs and observers agree that many viewers would pay a premium for one-time viewing of popular films, sports events, and other special fare. But few viewers have the equipment needed to receive the programming PPV operators pinpoint to individual homes. Thus, most showings to date have reached an extremely small audience. The most recent major pay-per-view event, the super-welterweight Hearns-Duran bout in June 1984, eked out a pay-per-view audience of only about 70,000 viewers, at $15 to $20 a pop. Confident predictions of 200,000 viewers were quickly forgotten.

MARKETPLACE: In 1982 pay-per-view proved simultaneously that it was technically viable but economically hazardous. The latter point didn't sink in quite as swiftly as the first, and the next year saw pay-per-view operators schedule more fights, movies, and concerts, attract a handful of viewers, and then, as often as not, vanish into oblivion.

By 1984 entrepreneurs had learned to ignore their own publicity and adopt a stance of watchful waiting. Bruce Brandwen, president of the Black Tie Network, a two-year-old culturally oriented pay-per-view group that has yet to schedule a program, admits that pay-per-view's time has not yet come. Not until late 1985, he estimates, when six million or more sets will have "addressability" (see box), will pay-per-view have real potential as a business.

Not everyone is so pessimistic. In August the Hi Life Channel announced that it would offer erotic films as well as feature films on a "pay-per-night" basis. EventTeleVision, a joint venture of four major cable operators, claims that it will be offering a series of events in 1985. And Hollywood, which gets a larger cut of the profits from PPV than from video-cassette rentals, has remained enthusiastic.

But the great imponderable remains the speed at which pay-per-view's potential universe will expand. Roughly five million homes can now receive pay-per-view. But not all new or rebuilt cable systems feature addressability, which costs $150 to $200 per set. Many cable operators argue that pay-per-view doesn't earn enough money to justify the cost, though their reluctance to invest in it, of course, perpetuates its unprofitability. And until the number of homes equipped for pay-per-view begins to rival the corresponding figure for video-cassette recorders, the studios will be reluctant to release their choicest films to PPV operators before offering them on cassettes.

JAMES TRAUB

Turn on the segment that cable forgot.

There's an untapped segment of potential subscribers who are looking for something more than repackaged, repeated broadcast leftovers. They haven't said no to the idea of cable, just to the programming they've been offered. To turn on new and different subscribers, you've got to offer something new and different. That's where the new Arts & Entertainment Network fits the picture.

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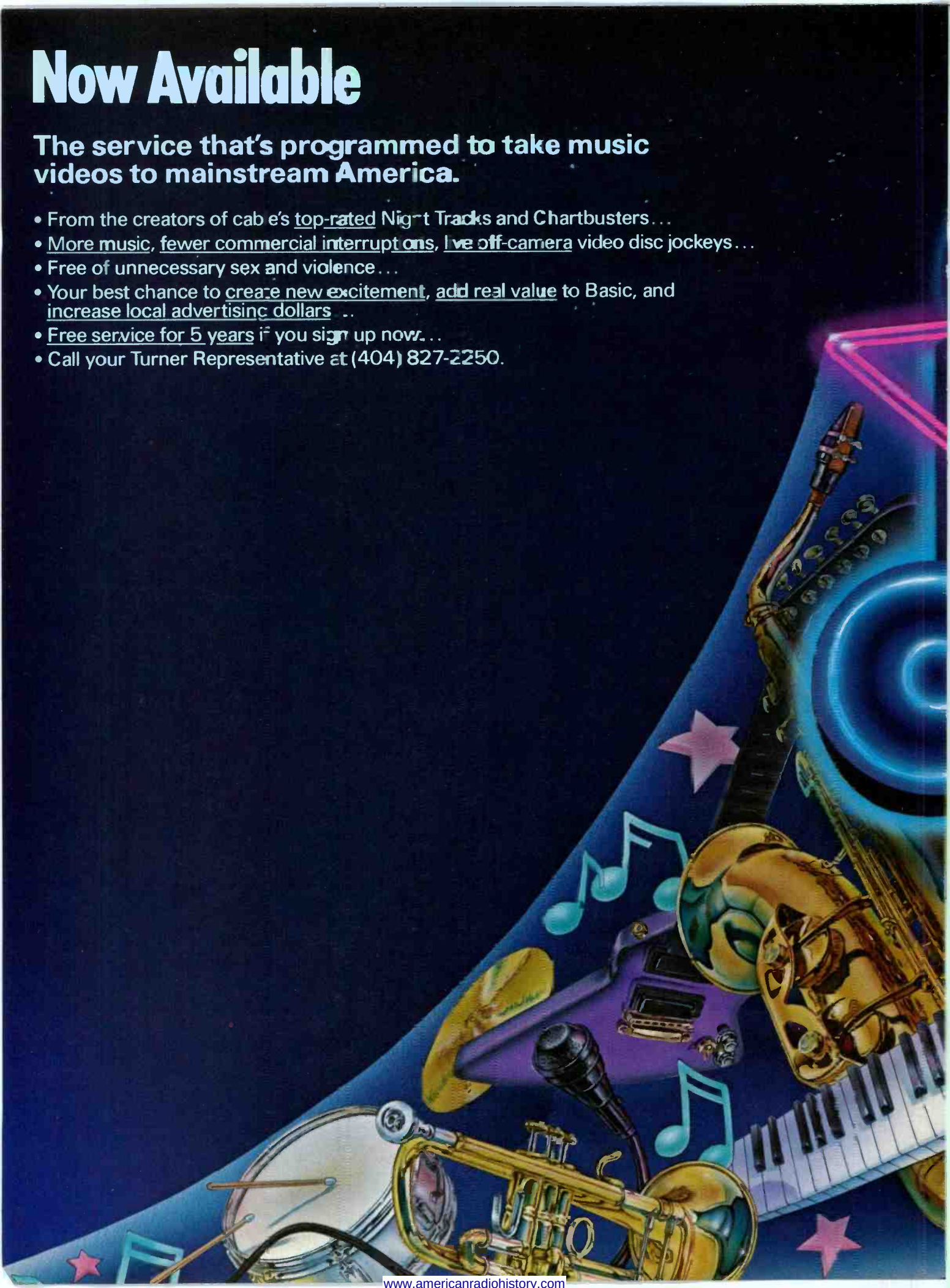

MULTICHANNEL MDS:

GOING TO TOWN WITH WIRELESS CABLE

Wireless cable is as hot as a comet this year, according to its promoters. The question is whether it will burn out almost as quickly as it arrives on the pay-television scene.

Observers say the new medium, formally known as MMDS (see box), has a shot at signing up millions of potential subscribers who live in metropolitan areas not yet wired for cable television. Entrepreneurs apparently share that optimism: Some 16,000 applications for four-channel MMDS licenses were pending in the fall of 1984 at the FCC, awaiting selection by lottery. Wireless cable wasn't up and going yet, but a handful of firms were already licensed and preparing to begin operations. Industry consultant Jane Henry says wireless cable is the "strongest overall competitor for pay-TV services to homes not passed by cable."

MARKETPLACE: If MMDS develops as its boosters hope, it will provide 4, 8, 10, or more channels indistinguishable from cable television programming. Subscribers don't care whether "cable" comes into their homes over the air or through an actual cable, says Mark Foster, chairman of the leading MDS carrier, Microband. Thus the coinage "wireless cable."

The key difference for the operator is that the capital required to start a wireless cable operation is only a fraction of that needed to wire a community for cable. Foster says big-city cable franchisees are faced with up-front construction costs of as much as $1,400 per eventual subscriber, while a wireless cable firm need invest only $300 per subscriber, and then only after signing him up.

Cable may be economically feasible in the suburbs, Foster believes, but he thinks the rural areas will belong to direct-broadcast satellite programmers and the inner cities to MMDS. "The question is whether cable is inevitable," he says. "If costs continue to skyrocket in urban markets, who will be able to afford it?"

To some savvy onlookers, however, the question is whether MMDS will survive in cities when cable arrives, offering many more channels at about the same monthly fee. "We feel that where cable and MMDS go up against each other, cable is going to win," says market analyst Arlene Zeichner of Link Resources. In that view, MMDS (like over-the-air subscription television) is only an "interim technology," with a short lifespan that will end as soon as cable comes up the street.

Cable's advance has already eaten into the audience of the old-style, single-channnel MDS operations, according to Link: Total MDS subscribers decreased from 750,000 in 1982 to some 500,000 in 1984.

REGULATION: Arguing that single-channel MDS couldn't compete against cable, Microband asked the FCC in 1982 to allocate microwave channels for wireless cable. The FCC complied with two decisions in May 1983, allocating eight channels per market, and also allowing schools to lease time on their technically identical ITFS channels (see box) to commercial firms.

Both actions amounted to a raid on behalf of entrepreneurs on a stock of underused microwave channels previously reserved for education. Not only did education lose the use of eight of the 28 ITFS channels (in cities where they weren't already claimed), but the FCC permitted schools to lease out most of their air time on the remaining instructional channels. Other nonprofit groups rushed to get licenses so they too could lease out time. Except for a minimum of just three hours per weekday of actual educational use required by the FCC, the air time could be devoted to HBO or the like. (A group of ITFS-using colleges have urged the FCC to toughen its rule to require six hours of actual educational use per channel.)

For a school unable to build an ITFS station without the leasing revenues, a little air time seemed a better deal than none at all. That argument was also adopted last summer by some public broadcasters who urged PBS to use lease-outs to pay for a planned national ITFS network. PBS has licenses in more than 80 cities for the National Narrowcast Service, which would transmit training for nurses and lawyers, and other adult education courses.

Whatever happens in the uneasy partnership of entrepreneur and educator, ITFS will be a changed medium, each channel now capable of reaching thousands of people in their homes rather than just hundreds of students in their classrooms.

Adding the leased ITFS channels, meanwhile, will make wireless cable all the more attractive by expanding the number of channels offered. Microband, for instance, aims to lease ITFS channels and piece together multichannel MDS systems in 15 to 25 cities, according to Foster.

TECHNOLOGY: Microband claims it will offer as many as 32 channels of programming by carrying pickings from cable networks, and by counting in their number of channels the city's regular over-the-air stations. The receiving equipment will pick up all the regular broadcast channels, as well as the MMDS and ITFS channels, and feed them all through the same set-top converter box, cable-style.

STEVE BEHRENS

THE NEWEST CHANNELS IN TOWN

The self-contradictory phrase "wireless cable" is a salesman's term for a newly invigorated television distribution medium known in FCC officialese as multichannel multipoint distribution service (MMDS).

The new service is technically the same as the nine-year-old single-channel MDS service, except that it groups four or more channels under a single operator. Schools and other educational institutions in many cities have long operated a variant called ITFS (instructional television fixed service), using a band of microwave channels reserved for education. MMDS, MDS, and ITFS all use low-power over-the-air microwave signals that typically travel some 25 miles, terrain permitting. Because microwaves are degraded or blocked by hills, buildings, or even dense foliage, there usually must be an unbroken line of sight between sending and receiving antennas.

A wireless cable subscriber is provided with a special rooftop antenna, a descrambler, and a downconverter to convert the microwaves to lower frequencies that are piped into the television set.

MMDS may be the answer for millions of city dwellers who want the cable networks but still await the wire.

WESTINGHOUSE BROADCASTING AND CABLE, INC.

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DBS:

IF WISHES WERE DISHES

As recently as February 1984, Wall Street experts were, for the most part, bullish on direct-broadcast satellites (DBS). Forty million subscribers nationwide and revenues expected to exceed $700 million by the end of this decade were not too much to expect, according to a study by the marketing analysts at Frost & Sullivan. However, by September, when the country's first and only operating DBS company, United Satellite Communications Inc. (USCI), found itself perilously close to bankruptcy, this optimistic outlook had taken a sobering turn. Only USCI's merger with Satellite Television Corp. (STC) allowed the foundering company to continue operating.

TECHNOLOGY: At the outset, USCI decided to steal the march on its DBS competitors by using existing satellites rather than waiting for the launching of a new generation of high-power satellites. The high-power satellites would use frequencies in the Ku-band (12 to 14 gigahertz) that could be received by uncommonly small (about three feet across), inexpensive dish-shaped antennas. In its rush to be the first to broadcast from space, USCI leased time on a medium-power Canadian satellite already operating on lower frequencies. Because the size (and cost) of a receiving dish increases as the satellite's transmitting power decreases, the company's customers have had to purchase somewhat larger dishes. USCI made the switch despite warnings that the weaker satellite signals might result in erratic reception. But after its first year of operation, USCI found that reception was not a problem. What did turn out to be a problem was a market smaller than anticipated.

MARKETPLACE: Indeed, the question about DBS used to be whether there were enough potential subscribers to support three or more competing DBS companies. Today the question is whether even one company can succeed. Video-cassette recorders have proliferated, becoming the pay-TV technology of choice for many of the almost 30 million Americans not served by cable television. And many rural and exurban Americans are buying their own satellite dishes to pick up the free transmissions of cable networks without buying subscriptions from either the networks or a DBS company.

The message has not been lost on prospective DBS operators. Of the seven companies approved for DBS operations by the FCC in 1982, so far only four have kept to their original plans: USCI, STC, Direct Broadcast Satellite Corp., and Dominion Video, the latter expecting to deliver religious programs and family shows starting in 1986. RCA Americom dropped plans for its own DBS and will stay in the business only to supply satellites for other programmers. Western Union, which originally proposed four DBS satellites to cover the entire continent, has withdrawn outright. Publisher Rupert Murdoch was to have begun a DBS service in 1984, but decided to wait for the development of high-power satellites.

USCI, meanwhile, has garnered fewer than 15,000 subscribers in 26 states since its service began in November 1983. The company charges $39 a month for its five-channel service, and $400 for an umbrella-sized receiving dish, and offers sports, movies, news, and music videos.

Undercapitalized from the start, the New York-based company lost $500 on every dish installed and, only months after it became operational, started running out of money. In March 1984 the company failed to raise the $40 million needed to stay on the air past August, and its principal investor, Prudential Insurance, which had already put close to $45 million into the company, went looking for a partner.

While USCI was struggling, the slower-moving STC was planning for an early-1985 debut. A subsidiary of Comsat, the first company to propose DBS in the U.S. in 1980, STC had been considered likely to dominate DBS because of its parent company's satellite expertise and financial clout—and still may do so. But even Comsat has sought a partner to help bear the $400 million construction costs.

CBS, which announced in 1983 that it wanted to enter the DBS field to develop the capacity to broadcast high-definition television, seemed a likely partner for a time. But in June 1984, CBS (like Columbia Pictures, Sears, and General Motors) backed away from DBS after studying STC's plan and deciding the investment would be excessive.

Finally in August USCI and STC found in one another the partner each had sought for months, and they merged. The new company will serve northern regions of the country until it expands to a nationwide, six-channel service using STC's satellites, probably in spring 1986. But overall prospects for high-power DBS remain "pretty grim," according to market analyst Mark Kriss, of SRI International. Kriss predicts that many more consumers will bypass DBS and buy their own satellite dishes as the cost continues to drop.

REGULATION: The FCC has declined to regulate DBS, except to approve construction permits and allot channels. (The commission was expected to rule on a second round of DBS applications in November 1984.)

The FCC's hands-off DBS policy did receive some judicial attention in 1984 when a federal appeals court ruled that DBS could not be treated as a common carrier, and was therefore subject to content regulations similar to those broadcasters must follow. This reversed a 1979 FCC decision. The court has since refused the commission's request to reconsider.

RICHARD BARBIERI

ROOFTOP DELIVERY

DBS is television without the middleman. Providing the first wholly national service, direct-broadcast satellites can beam television programs directly to individual homes, skipping the local broadcaster or cable operator. What makes this possible is a communication satellite's huge "footprint"—a coverage area many states wide—coupled with the development of relatively small, inexpensive dish-shaped receiving antennas, or earth stations.

A receiving dish three to four feet in diameter is positioned on the subscriber's roof or in his yard and pointed at the DBS satellite positioned 22,300 miles above the equator. The satellite's signal is captured by the dish, amplified, and then sent to a tuner on or inside the TV set. There the signal is converted from super-high frequencies to the VHF signals an ordinary TV set can receive.

The DBS market has yet to materialize, and the rush to provide service has already turned into a tactical retreat.

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SATELLITES:

A GLOBAL REACH, FOR BETTER OR WORSE

Anik, Galaxy, and Sakura. Intersputnik and Eutelsat. Kopernicus and Intelsat. These are the names of some of the more than 100 communications satellites now in service around the world. Know them well, for they are changing your life.

More than two decades after the tiny Telstar satellite first demonstrated the potential of communications relays in space, and one decade after the first satellites were launched for domestic U.S. communications, a new chapter in the story is unfolding. It is likely to end only with a complete transformation of the world's broadcasting and telecommunications systems.

Between now and the end of the century, $100 billion will be spent to build and launch satellites, according to conservative estimates. Optimists think the total could be triple that. All over the world, new satellites are being planned for a variety of purposes, including direct broadcasting to homes (DBS), video teleconferencing, relays of computer data, and extension of telephone service to remote areas, ships, cars, and aircraft. The United States is still the leader in satellites, but other countries are investing billions to catch up, including, significantly, Third World countries that have not previously participated in developing high-tech communications.

Satellites provide opportunities to democratize and decentralize communications, powerfully threatening the established order. They have already done so domestically, linking together the diffuse cable television industry into a national force, and making competition possible with AT&T's long-distance telephone monopoly. From Alaska to Zaire, satellites are bringing television and telephone service to regions that have been deprived of the most elemental contacts with the outside world.

From their perches in the sky, these electronic birds show little respect for traditional political and cultural boundaries. The results can be fairly benign: Hotel guests in Tokyo can already watch Ted Turner's Cable News Network. But some fear that satellites will tip the balance of communications ecology. The U.S. Information Agency's recently disclosed plan to launch a satellite transmitting American radio programs behind the Iron Curtain is but one example (the Soviet Union has sought an international agreement that would prohibit such transmissions without the consent of the receiving country).

Once a topic of interest to a narrow industry, the future development of satellites is now considered crucial in the highest councils of the world's governments. In Geneva the International Telecommunications Union (ITU), a sort of global version of America's Federal Communications Commission, will begin to consider a new international regulatory regime for satellites in 1985. The ITU's World Administrative Radio Conference on satellites will undoubtedly become a forum for acrimonious debate between the advanced countries, which have dominated satellite communications, and the developing countries, which want to reserve radio frequencies and orbital parking spots that they fear the rich nations will gobble up.

Within the larger struggle, there is a narrower dispute over the future of the oldest of all satellite service providers, Intelsat (the International Telecommunications Satellite Organization). Founded 20 years ago by the United States Government, Intelsat has grown to become the world's exclusive provider of international satellite links, and is owned by a consortium of more than 100 countries. But its monopoly is being questioned by a number of companies seeking to extend the FCC's deregulatory philosophy onto the international scene. The Reagan Administration is understood to be considering a new policy that would authorize such companies to compete with Intelsat, but at the risk of angering countries that still regard basic communications services to be the purview of state-owned monopolies.

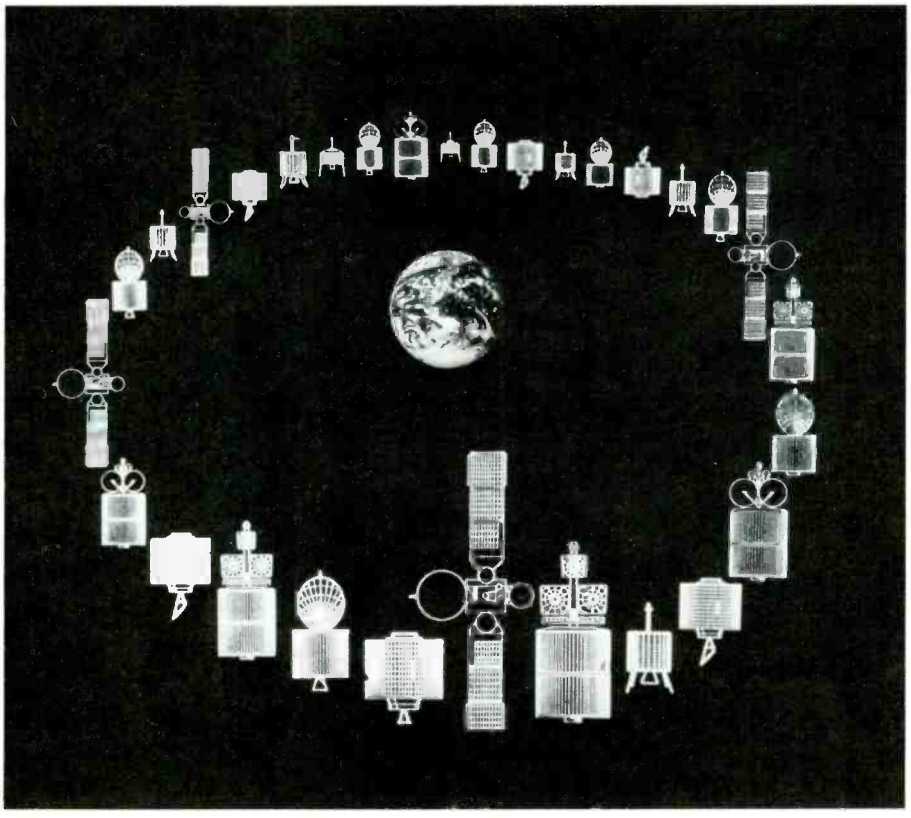
At their most extreme, the developing conflicts over satellites can be frightening. Both the Americans and the Soviets are developing military systems designed to attack and disable satellites. Since satellites are a vital part of military com-

BIGFOOTS OF THE SOUTHERN SKY

Satellite transmission has virtually remade television since Telstar first relayed a black-and-white TV picture in 1962. With their continent-wide reach and much lower cost, satellites are replacing "landlines" as the medium for networking. PBS switched to satellites in 1979, and the Big Three networks are in the process of changing over. The myriad 24-hour cable networks, the "ad hoc" networks created for specific broadcast specials, and many of the countless live remote reports on newscasts are possible only with satellite hookups.

Galaxy I, Westar IV, Satcom III-R, and other solar-powered satellites seemingly hover in the southern sky, orbiting 22,300 miles above the equator. Their geostationary orbit takes 24 hours to complete, matching the earth's rotation. As a result, the satellites can maintain continuous line-of-sight contact with earth stations sending and receiving relays of television, telephone, and other electronic traffic. They are so high that one satellite's beam, or footprint, can cover almost one-third of the earth's surface. A spot beam can also be designed to concentrate power on a smaller receiving area.

Most communications satellites today carry 24 transponders, each capable of relaying one television channel (two, with special equipment) or a thousand telephone calls. A signal is beamed up to a satellite ("uplinked") on one super-high frequency, and beamed back to earth on another. Most satellites operate in the so-called C-band (four to six gigahertz), but many future birds will use the Ku-band (11 to 14 gigahertz).



SCIENTIFIC-ATLANTA

munications, any attack on a satellite could be a prelude to a devastating conflict on earth. Yet satellites may also have implications for peace. They have been used for more than a decade to provide the Washington-Moscow hotline, and their ability to straddle borders may provide common cultural images and concepts to different peoples, just as television has provided a certain unity to the American culture.

Much attention has been given lately to fiber-optic communications systems, which some say will be more efficient than satellites for spanning long distances. And it's true, for instance, that the planned high-capacity transatlantic fiber-optic cable will probably make overseas calls comparable in cost to domestic long-distance service. But a cable, by definition, goes to only one place, so no cable will be able to overcome a satellite's fundamental advantage, which is its ability to provide simultaneous economical service to any point on the globe. In America, fiber optics' introduction appears to be having no effect on the proliferation of satellites. There are already more than 20 domestic satellites serving the country, and the number is likely to double in the next seven years. So many applications for permission to launch satellites have been lodged that the FCC has ruled that, beginning in 1987, some birds must orbit closer together—separated by just two degrees of orbital arc instead of four degrees, as is now required.

In fact, so many satellites have already been lofted into space that the industry worries a bit about a glut of unused transponders. After the FCC monitored actual satellite use in July 1984, it reported that 145 of the 360 transponders in the most commonly used frequency bands were inactive at the time they were checked. That vacancy rate becomes even more significant with the introduction of new transmission techniques that double the capacity of a transponder. Yet the satellite industry is optimistic its capacity will be used.

The visible part of the satellite boom is evident on earth. America's millionth satellite dish will be installed during 1985, and two million could be in use by the end of 1986. Advances in microcircuitry are making earth stations so inexpensive that they will soon cost no more than a color TV set. Dishes for receiving television have halved in price every year since 1979. They are already sold over the counter in Tokyo stores. Within a year or two they'll be showing up at Radio Shack.

Satellites have already made possible such new services as reliable telephone contact with ships and two-way videoconferencing between cities. The Chrysler Corporation has announced plans to make a satellite-based navigation system for cars. The Gannett Company uses a bird to relay its national daily newspaper, *USA Today,* flashy color pictures and all, to a network of printing plants. And the leading news services are switching their wires from leased phone lines to satellite transmission. Ultimately, the growth of satellite use will be slowed only when human ingenuity fails to find new jobs for satellites to do. JONATHAN MILLER

The satellite boom can be seen on earth, where the millionth receiving dish in America will be installed in 1985, and dish prices continue to drop.

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SATELLITE CHANNELS:
A GUIDE

BASIC CHANNELS

NAME OWNER LAUNCH DATE	MEANS OF SUPPORT	HOMES REACHED (MILLIONS)	TARGET AUDIENCE	CONTENT
Entertainment & Sports Programming Network (ESPN); ABC Video Enterprises; Nabisco *Sept. 1979*	System pays 20¢ per subscriber; advertising	34	General (esp. male)	 In-depth daily sports coverage USFL and college football, Canadian football, college basketball, auto racing, boxing, and golf; business news 6-9 AM daily
Cable News Network (CNN) Turner Broadcasting *June 1980*	System pays 15¢–22¢ per subscriber; advertising	28.5	Upscale, general	Continuous hard news reporting, live coverage of breaking stories; soft features
USA Network Time Inc, Paramount Pictures, MCA Inc. *Sept. 1977*	System pays 7¢-10¢ per subscriber; advertising	28	Upscale, general	Broad-based entertainment: prime-time sports, *Night Flight* (video art and music); news magazines; children s, health, and comedy shows; syndicated programming; movies
CBN Cable Network (CBN) Christian Broadcasting Network *Apr. 1977*	Advertising	25.1	Families	Family programming including classic films, comedies, westerns, children's shows, game shows, inspirational shows
Music Television (MTV) MTV Networks Inc. *Aug. 1981*	System pays 10¢-15¢ per subscriber; advertising	22.6	12-to-23-year-olds	 On-air vee-jays, rock videos, concerts, interviews, music news (Pays for exclusive rights to some premiere videos)
Lifetime Hearst/ABC; Viacom *Feb. 1984*	Advertising	20.1	General (esp. female)	 "Programming devoted to health science and better living": nutrition shows, fitness shows, talk shows; preventative medicine; parenting
Nickelodeon MTV Cable Networks Inc. *Apr. 1979*	Systems pays 10¢-15¢ per subscriber; advertising	20.1	Children, adolescents	Children's programming: cartoons, variety, and adventure shows, preschoolers' programming; comedy series, 7 AM-8 PM daily
Cable Satellite Public Affairs Network (C-SPAN) Nonprofit corp. of cable companies *Mar. 1979*	Systems pays 3¢ per subscriber	19.3	Adults interested in public affairs	Live coverage of U.S. House of Representatives debates, congressional hearings; national call-in shows, profiles of public figures and current issues
Nashville Network Group W *Mar. 1983*	Advertising	17.9	General	 Country-oriented entertainment including sitcoms, music videos, game shows, Grand Ole Opry concerts

NAME OWNER LAUNCH DATE	MEANS OF SUPPORT	HOMES REACHED (MILLIONS)	TARGET AUDIENCE	CONTENT
Financial News Network (FNN) Financial News Network *Nov. 1981*	Advertising	17	Upscale professionals	National business & financial news; stock market reports, talk shows; continuous stock ticker. 6 AM-7 PM daily
CNN Headline News Turner Broadcasting *Jan. 1982*	Unless the system carries CNN it pays 22¢ per subscriber; advertising	12.6	General	 Major headlines & hard news in 30-minute cycles. (Also carried on over 100 broadcast stations)
The Weather Channel Landmark Communications *May 1982*	System pays 6¢-10¢ per subscriber; advertising	12	General	Local, regional, and national forecasts; seasonal outlooks; special forecasts for sports, aviation, and travel
Arts and Entertainment Service (A&E) Hearst; ABC; RCA *Feb. 1984*	5¢-7¢ per subscribers; advertising	12	Upscale adults	 Cultural programming: drama, dance, documentaries on the arts & related subjects; profiles of artists, actors, playwrights; Broadway plays
Satellite Program Network (SPN) Satellite Program Network Inc. *Jan. 1979*	Advertising	11.5	Upscale general	Regular series on hobbies, business, finance, personal money-management, entertainment & health-care programs; how-to shows; classic movies; music videos; international programming
Modern Satellite Network (MSN) Modern Talking Picture Service Inc. *Jan. 1979*	Program producers pay for air-time; advertising	10.4	General	Consumer information; product demonstrations. *BizNet, News Today, Consumer Inquiry.* 10 AM-1 PM Mon-Fri
The Inspirational Network (PTL) Heritage Village *Apr. 1978*	Church contributions	10	Christian families	Inspirational programming: talk shows, music, news, specials. (Also carried on a number of MDS, LPTV, and SMATV systems.)
Black Entertainment Television (BET) Robert L. Johnson; TeleCommunications Inc.; Taft Broadcasting; HBO *Jan. 1980*	System psys 3¢ per subscriber; advertising	8	Black community	 Black-oriented sports & entertainment; musical events; political discussions, phone-in shows; talk, variety, public, and cultural affairs shows; movies; jazz and soul videos
The Silent Network Sheldon Altfeld *Jan. 1984*	Advertising	6.8	Deaf & hearing-impaired	Original programming with sign language including music, variety, and talk shows, aerobics. 10 AM-Noon Sat
Country Music Television Telestar; Music Village USA *Mar. 1983*	Advertising	5.5	18-to-54-year-olds	 Country-music videos; live concerts
The Learning Channel (TLC) Appalachian Community Service Network. *Oct. 1980*	Systems pays 3¢-5¢ per subscriber	5	Adults	Lifelong learning for adults including information and public affairs; how-to programs; small-business management; resumé-writing; career development; parenting 6 AM-4PM daily
National Jewish Television Joel Levitch. *May 1981*	Advertising	5	Jewish community	Public-affairs panels; educational shows; television magazine; programs on Israel. 1-4 PM Sun
AP Newscable Associated Press *June 1965*	System pays according to no. of subscribers	4.5	General	Text news service: national, state, sports, and financial news
Trinity Broadcasting Network (TBN) Paul F. Crouch *May 1978*	Donations	4.5	Families	Christian-oriented fare: talk shows, variety shows, musicals, Bible studies, children's shows
Reuters News View Reuters *Apr. 1971*	System pays according to no. of subscribers	4.2	Upscale professionals	Text news service: general and financial news, sports

Continued on Page 58

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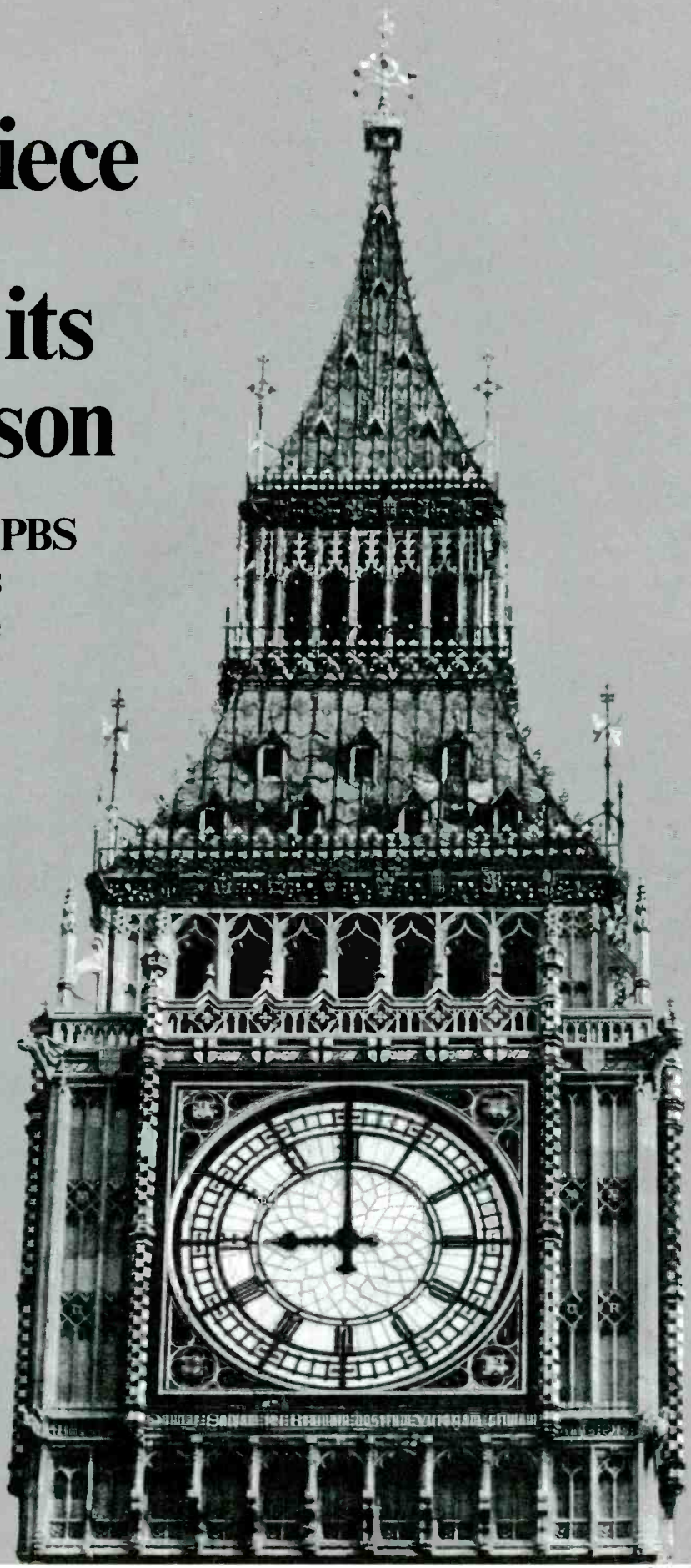
The Jewel in the Crown

All for Love

Strangers & Brothers

The Citadel
(Encore)

The Irish R.M.
(Encore)



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from Diana Ross to Kenny Loggins to Stevie Wonder
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and music mix that appeals to a large,
new audience for video music 24-hours-a-day.
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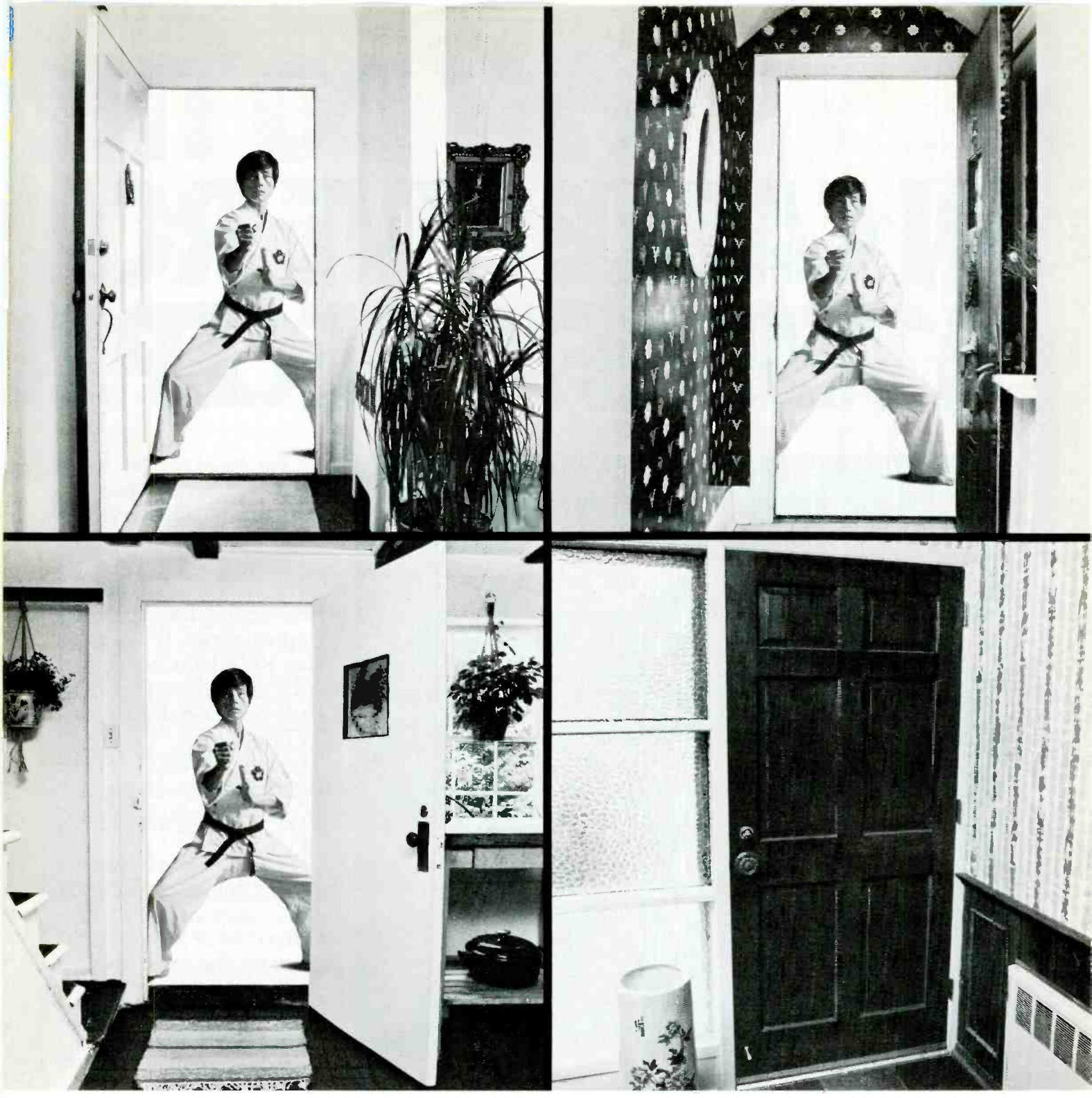
	NAME OWNER LAUNCH DATE	MEANS OF SUPPORT	HOMES REACHED (MILLIONS)	TARGET AUDIENCE	CONTENT
UPI	**UPI Data Cable** United Press Int'l *Nov. 1982*	System pays according to no. of subscribers	4	General	Text news service: general and financial news, sports
SIN	**Spanish International Network (SIN)** Televisa S.A.; Rene Anselmo *Sept. 1979*	Advertising	3.5 (Spanish-speaking homes)	Spanish-speaking community	 Programs in Spanish: news, soap operas, sports, musicals, variety shows, novelas, movies, mini-series
EWTN	**Catholic Cable Network (EWTN)** Mother M. Angelica *Aug. 1981*	Donations	2.5	Catholic community	Catholic religious programming; family entertainment, 8 P.M.-midnight nightly
	Dow Jones Cable News Dow Jones Co. *Apr. 1981*	System pays 1¢ per subscriber	2.3	Upscale professionals	Text news service: general and financial news, sports
The CABLESHOP	**Cableshop** Adams Russell Co. *Nov. 1983 #*	Advertising	2	18-to-49-year-olds	Long-form informational advertising
ncn	**National Christian Network (NCN)** Ray Kassis *June 1980*	Fees from program producers	1.2	All denominations	Religious dramas; talk shows; children's shows
Genesis	**Genesis Cable Storytime** Genesis Research Corp. *Oct. 1983*	10¢ per subscriber	350,000	General	 Children's stories on videotex
Cable Music Channel	**Cable Music Channel** Turner Broadcasting *Oct. 1984*	Advertising	N.A.	18-to-49-year-olds	 Variety of music videos: pop, rock, dance, R&B, country, jazz, easy listening, classical
Discovery	**Discovery Music Network** Glen Taylor; Discovery Broadcasting System *Jan. 1985*	Advertising	N.A.	24-to-45-year-olds	Music videos: Top 40, adult contemporary
VH-1 VIDEO HITS ONE	**Video Hits 1 (VH-1)** MTV Networks, Inc. *Jan. 1985*	No charge if MTV is carried; otherwise 10¢ to 15¢ per subscriber; advertising	N.A.	25-to-54-year-olds	On-air vee-jays, soft rock, R&B, country music and top 40 music videos

SUPERSTATIONS

TBS SuperStation WTBS	**WTBS** Turner Broadcasting System Atlanta *Dec. 1976*	System pays 10¢ per subscriber; advertising. Carrier: Southern Satellite System	31	General	 Network reruns; sports; movies; news; women's shows; music videos; documentaries
WGN the Chicago superchannel	**WGN** The Tribune Co. Chicago *Oct. 1978*	System pays 10¢ per subscriber; advertising. Carrier: United Video	14.2	General	Network reruns; sports; movies; news
WOR	**WOR** RKO General Television New York *April 1978*	System pays 10¢ per subscriber; advertising. Carrier: Eastern Microwave	4.9	General	 Network reruns; movies; sports; news
WPIX	**WPIX** The Tribune Company New York *June 1984*	10¢ per subscriber; advertising. Carrier: United Video	800,000	General	Network reruns; sports; movies; *Independent Network News*

#Cableshop stopped operating in June, 1984. It will restart in Jan. 1985.

Continued on Page 62



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The winning ways of Black Belt Theater continue. This quality group of action packed and color feature films is now sold to 106 stations.

What this means is that in 75% of all the television households in the country, viewers can tune into the audience grabbing entertainment that is Black Belt Theater.

Because of this extraordinary performance WW Entertainment is following up Black Belt Theaters 1, 2, and 3 with a new group of Sir Run Run Shaw feature films which will be released as Black Belt Theater 4.

If you're situated in one of the fast disappearing markets that does not feature Black Belt Theater, it's time for you to strike. Call your WW Entertainment representative today and start beating up on the competition.

BLACK BELT THEATER

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DIVISION OF WORLD NORTHAL CORPORATION

*SOURCE: A.C. NIELSEN NTI 1984

WHY DO THE IN CABLE GIVE RCA A TERRIFIC RECEPTI

A SMALL SELECTION OF OUR BIG NAMES.

For good reason. In fact, for lots of good reasons. Superior satellite service is a good place to start.

It all began in 1975, when the cable TV industry was looking for expansion opportunities. It was then that RCA launched its first Satcom satellite. From that early point on, HBO,® WTBS, ESPN,™ CBN, Showtime®/TMC™—all the biggest names (and initials) in programming—signed up.

There were, of course, other satellites available. But not a single one of them offered what Satcom did. Namely, the concept of a dedicated cable satellite with 24 transponders and, later, a back-up system that protected them in the event of a satellite failure. And to this day, they *still* haven't matched our protection system.

Needless to say, it is comforting for our family of programmers to find this kind of safety in RCA.

There's plenty of comfort in a reliability factor of 99.99%. It's hard to beat that kind of statistic.

This exemplary record is nothing particularly out of the ordinary. RCA has always represented the most positive images in the world of communications. Since the early part of the cen-

RCA AMERICOM. THE COMPANY THAT LAUNCHED THE SATELLITE

BIGGEST NAMES AMERICOM SUCH ON?

OUR BACK-UP SYSTEM OFFERS PROTECTION AGAINST BLACKOUTS.

tury, RCA has stood for enterprise, innovation and an extremely high level of expertise.

That high level is about to manifest itself in a new launch that a lot of people are very excited about. This new spacecraft is a 47-watt, Ku-band satellite with the capability of serving receiving antennas as small as three feet in diameter, thereby opening up a whole new world to operators and programmers. Throughout the contiguous United States, all sorts of places will become easy mounting locations for these small receiving dishes. An estimated 22 million households not currently able to receive cable TV will become an exciting new marketing universe.

It's no surprise. It's merely typical of RCA's continuing technological leadership.

The launch is scheduled in the fall of 1985. Therefore, the timing couldn't be better for you to inquire about RCA Americom and learn more about all the benefits it can have in store for you and your business.

Call Bill Berman or Don Reinert at (609) 734-4000 for more detailed information.

RCA
ONE OF A KIND

COMMUNICATIONS INDUSTRY.

GET READY FOR ANOTHER PHENOMENON.

PAY CHANNELS

NAME OWNER LAUNCH DATE	DELIVERY SYSTEMS	NO. OF SUBS.	CONTENT
Home Box Office Time Inc. *Sept. 1975*	Cable, MDS	13.5 Million	 Movies, sports, family shows, made-for-pay movies, mini-series, specials
Showtime* Warner Communications; Warner Amex; Viacom *July 1976*	Cable, MDS, SMATV	5.4 Million	Movies, Broadway productions, pop music specials, made-for-pay movies, comedy and dramatic series 
The Movie Channel* Warner Communications; Warner Amex; Viacom *Jan. 1980*	Cable, MDS, SMATV	3.1 Million	Feature films, film festivals
Cinemax Time Inc. *August 1980*	Cable, MDS	2.7 Million	 Feature movies, mini-series, comedy, music
The Disney Channel Walt Disney Productions *April 1983*	Cable	1.2 Million	Family-oriented programming including made-for-pay and Disney movies, classic cartoons 6 A.M.-1 A.M.
The Playboy Channel Playboy Enterprises *Dec. 1980*	Cable, STV, SMATV, video cassettes, DBS	740,000	Soft-core adult-oriented programming 8 P.M.-6 A.M.
Home Theater Network (HTN) Group W Communications *Sept. 1978*	Cable, SMATV	275,000	Family-oriented, foreign and classic movies; travel; music
Bravo Daniels & Associates; Cox Cable; Cablevision *Dec. 1980*	Cable	250,000	 American and foreign films, performing arts specials 7:30 P.M.-6 A.M. Mon-Fri 5 P.M.-6 A.M. Sat, Sun
American Movie Classics Daniels & Associates; Cox Cable; Cablevision *Oct 1984*	Cable	250,000	Classic Hollywood films (subscriptions sold in conjunction with Bravo as "The Rainbow Service") 7P.M.-6A.M. Mon-Fri 1 P.M.-6A.M. Sat, Sun
ON Satellite TV Oak Industries *April 1977*	STV, LPTV, SMATV, MDS	140,000	Movies, classics, adult films, sports childrens' shows, pay-per-view events
GalaVision Spanish International Network (SIN) *Oct. 1979*	Cable, SMATV, MDS	125,000	 Spanish-language films; weekly dramatic series; sports; musical & comedy specials in Spanish. 3:45 P.M.-4 A.M. Mon-Fri 11 A.M.-3 A.M. Sat, Sun

*Showtime and The Movie Channel merged in 1983, but continue to operate separately.
Note: 24-hour programming, unless otherwise indicated.

BACKYARD DISHES:

HELPING THEMSELVES TO EVERYTHING IN SIGHT

While many were doubting, the backyard satellite-dish business was booming. Suddenly it has become television's overachiever. The Federal Communications Commission in 1979 eliminated most restrictions on building, selling, or owning earth stations. At the time only about 5,000 Americans owned dishes, and nobody paid much attention to those video pioneers. Their number was small and growing slowly. After all, the price tag on these backyard antennas was then between $25,000 and $100,000.

But since 1980 the average price of backyard dishes has dropped 50 percent each year. Many receiving outfits now cost between $1,500 and $3,000. Furthermore, advances in design have brought a new breed of mesh dishes, less obtrusive and more acceptable to suburban zoning boards.

The number of dishes—estimated at 600,000 in the United States—is no longer insignificant. Many observers expect that 60,000 new dishes will be installed each month in 1985. A recent trade exhibition of the blossoming earth station industry drew more than 9,000 dish makers and sellers.

TECHNOLOGY: Program distributors have taken notice of the 600,000 households with backyard dishes and have begun to explore ways of frustrating their free access to pay-TV programs. Time Inc.—owner of Home Box Office, the most popular pay-TV channel, and its sister service Cinemax—now says it will start to scramble its satellite transmissions in 1985 so that only subscribers with special decoders will get viewable feeds. Time Inc. first mentioned the possibility of scrambling in 1982. The decreased growth its pay services have experienced recently may further delay this project, in which it has already invested some $8 million. By scrambling its signals, Time would, in effect, be creating a low-power (C-band) direct-broadcast satellite (DBS), a delivery system that would parallel the existing cable systems.

The eventual impact on dish-users depends on whether other programmers scramble their satellite feeds. The Disney Channel, for one, has said it will wait to see how HBO's plans work out before it decides what to do. In the end, more than a few programmers would have to scramble if a C-band DBS service were to put any pressure on the flourishing backyard-dish business. "There are plenty of other channels out there for people to pick up," says Mark Kriss, SRI market analyst.

The operative question in HBO's plans to start a DBS service is, of course, whether HBO and other pay-TV programmers can convince those who have been receiving their television free to start paying monthly bills. HBO's own research shows that at least one-half will probably elect to point their dishes at other satellites instead.

REGULATION: A number of court cases have questioned the legality of selling dishes, but all, so far, have been decided in favor of the dish industry. Lingering doubts about the legality of intercepting feeds are believed, however, to have hurt dish sales. The Society for Private and Commercial Earth Stations (SPACE), a lobbying group in Washington, D.C. representing dish makers and dealers, has for years sought legislation to legitimize their field. Such legislation was finally proposed in Congress in 1984. Although bills in both the Senate and House were not adopted, some of their language was attached to the cable deregulation bill passed in October 1984. According to SPACE, the bill was "a shot in the arm for the industry," stating clearly that the sale and use of backyard earth stations is legal.

Senator Barry Goldwater, author of the Senate bill that favored backyard dishes, asserts that Americans should be allowed to receive satellite-delivered television "without obligation" to programmers. "Everything above my house," he says, "belongs to me."

Another development rocking the home-dish industry arises from a 1983 FCC decision that will squeeze more satellites into the geosynchronous orbit. The FCC's so-called "two-degree" spacing order requires that satellites eventually be spaced two degrees apart instead of four. The change may cause interference on some older-model dish antennas by decreasing their ability to "discriminate between the broadcasts of one satellite and the broadcasts of the one next door," says industry analyst Raymond Boggs of the Venture Development Corporation.

MARKETPLACE: Five years ago there were a handful of small businesses—many were converted record and tape stores—selling backyard dishes. Today this decentralized group of satellite merchants, which still accounts for nearly all backyard dish sales, numbers more than 7,000. The past year has seen the establishment of the first franchised chain to sell backyard antennas. The franchiser, Brooks Satellite Inc., says it will open 100 stores around the country by the end of 1985.

RICHARD BARBIERI

Now that they're declared legal, and are multiplying fast, the dishes are creating headaches for pay programmers.

HOME DOWNLINKERS

The do-it-yourself TV reception movement—currently enabling more than half-a-million viewers to pull TV signals directly from satellites to their backyard "dish" antennas—has the maverick spirit of the Citizen's Band radio fad of the 1970s. But it holds such practical advantages for viewers, especially those in remote regions, that it is likely to last.

Pointed toward any of the more than 20 North American communications satellites, a backyard "satellite earth station" can intercept not only all the regular television channels but also the "raw feeds"—not intended for public viewing—sent by broadcast and cable networks to local stations and cable systems across the country. With an unobstructed view of the southern sky, it can receive 75 to 100 television channels and retransmissions of 40 FM radio stations.

The dish collects the satellite's faint microwave signal and amplifies it 500,000 to one million times. A cable carries the signal indoors to a "downconverter," which changes the frequency to one that can be received by an ordinary TV set. The apparatus often has a remote-control device that lets the viewer redirect the motorized dish toward another satellite and select one of its 24 channels.

CHANNELS OF COMMUNICATIONS

THE MAGAZINE THAT COVERS THE REVOLUTION

The explosion of electronic media has ushered in the dazzling second age of television. A new order of video communications is taking shape with cable, satellites, videotex, computers, and home video sweeping across the electronic landscape still dominated by broadcast television. Everything is on fast-forward today—technology, business, policy-making.

This means that our world is changing even more dramatically than it did with the arrival of television.

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•

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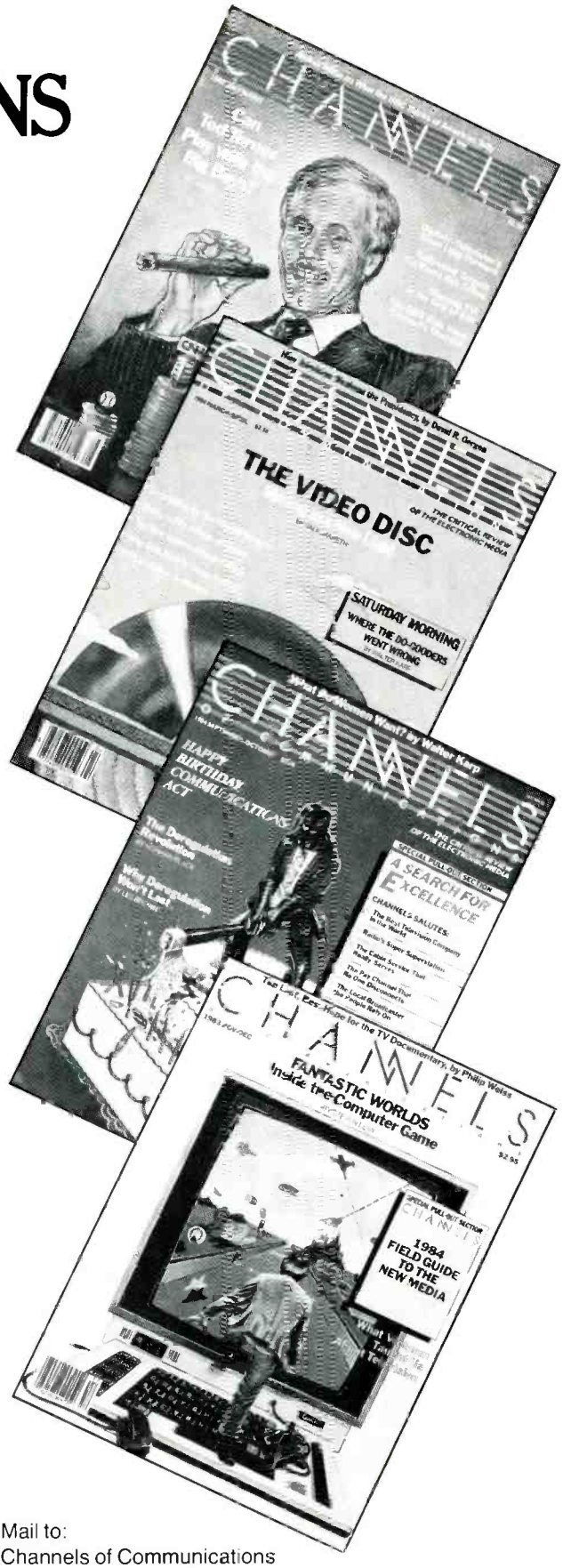

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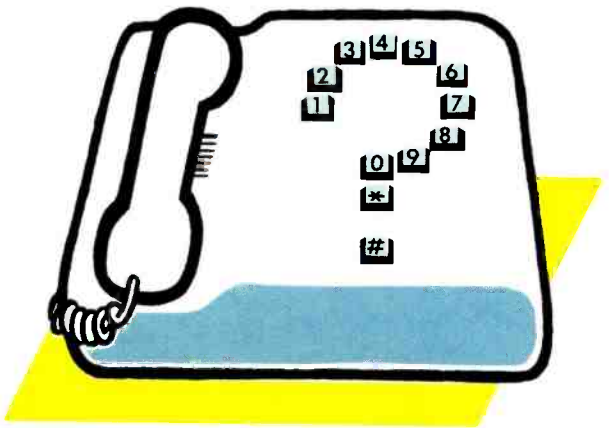
TELEPHONY:

DIAL "1" FOR COMPETITION

It's actually just a personal computer with a built-in telephone, or maybe a phone with a built-in computer, but the integrated voice-data terminal (IVDT) is a memorable symbol for the coming fusion of telephony and computing. AT&T, the traditional master of the telephone, will be trying to sell IVDTs, and so will IBM, the computer giant that recently bought a major telecommunications hardware manufacturer, the Rolm Corporation.



The corporate desktop is a crucial battleground in the new telephone wars that have expanded since January 1, 1984, when the Bell System was broken up by court order. AT&T was forced to divest its 22 local phone companies, its famous Bell logo, and other selected assets. Formerly the nation's largest company, it's now defending its rank as largest of some 200 companies trying to sell telephone equipment and the 400 or so selling long-distance phone service. But it was the promise of the combined telecommunications and computing market that consoled (some say delighted) AT&T after the breakup.

MARKETPLACE: Initial sales of the voice-data terminals may disappoint futurists as well as manufacturers. The idea of IVDTs is to increase office productivity, but it's not clear whether many people will want such a device. It may only be a case of expensive techno-gimmick overkill. Yet some kind of easy-to-use hardware combining the computer, the video screen, and the telephone is likely to succeed in the office and then usher videotex and other Information Age utilities into the home.

Computer-based technology is already heading there. New residential phones are laden with more and more microprocessor-based features. About one-tenth of the estimated 27 million phones sold in 1984 had new features such as autodialing. Telephone modems, which allow personal computers to communicate over phone lines, are also becoming increasingly affordable. Prices now range between $200 and $600, and by 1986 home phones with built-in modems-on-a-chip will be available.

Even among basic home phones, consumers are buying more high-quality phones instead of the cheap models whose quality disappointed so many in recent years. Market forces are driving those products out and the price of better phones down. Also due for improvement are the cordless models that accounted for about one-fifth of the phones sold in 1984. Future cordless phones will be linked to their base stations by beams of infrared light, avoiding the radio interference problems common today.

Telephone equipment is an important front in AT&T's defensive war, but still more important is long-distance service, the company's main source of profits. Its competitors say AT&T still carries more than 90 percent of the country's long-distance calls. The larger competitors have their own phone circuits to serve some parts of the country, but even the biggest like MCI must lease lines from AT&T to be able to reach all regions. Some small long-distance "resellers" exist entirely by buying AT&T service in bulk—WATS lines, for instance—and reselling it at a slight markup that still allows them to undercut AT&T's retail prices. Service by these carriers is sometimes technically awful, but it's cheap.

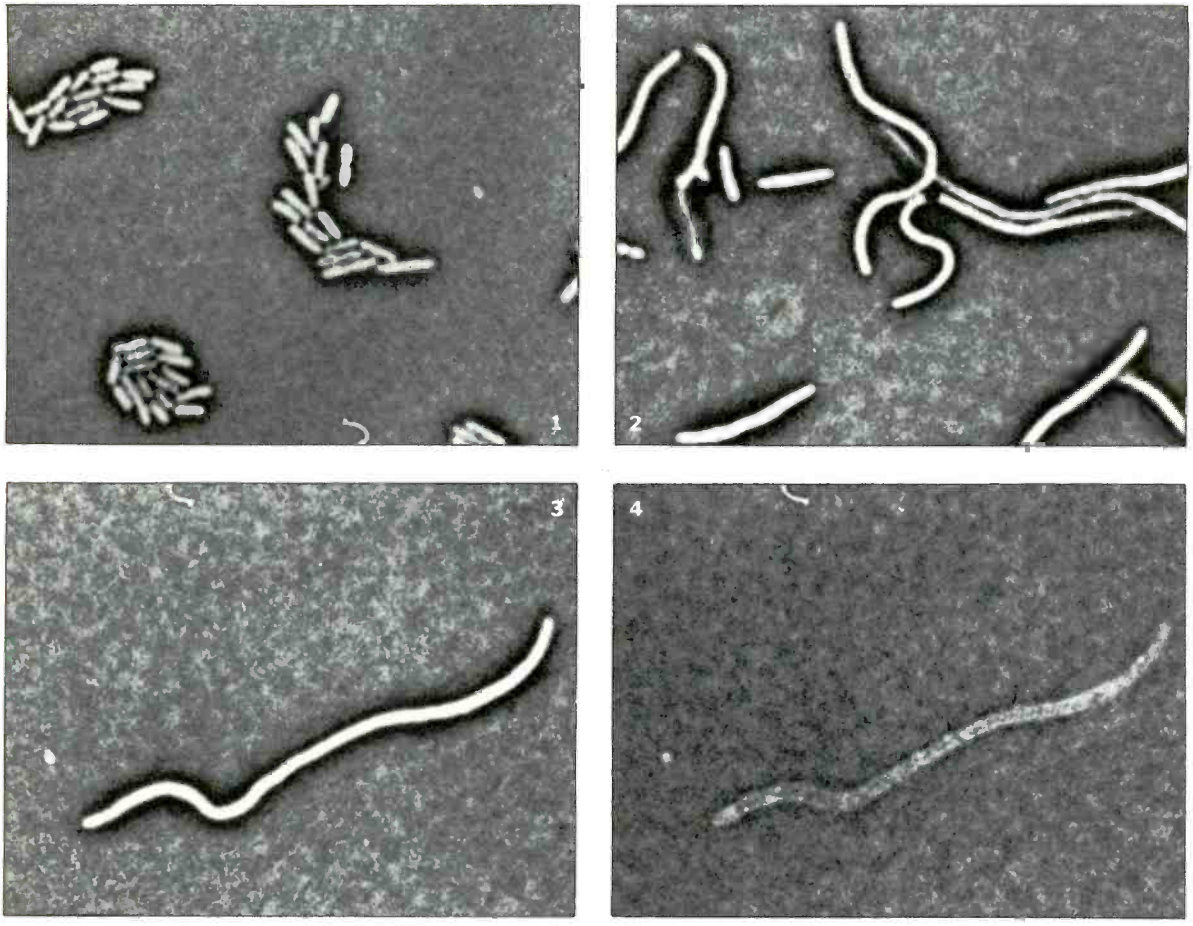
Their price advantage probably won't last, however. Observers expect a shakeout that will leave only a dozen long-distance companies operating at the end of a decade. A year ago, an independent carrier could promise rates as much as 30 percent below AT&T's. But now the savings are more like 18 percent, and competing carriers are being squeezed as AT&T reduces its long-distance prices. In particular, their cost advantage over AT&T is shrinking in city after city as local phone companies equalize the per-line "access charges" all long-distance carriers must pay them. (AT&T has been paying charges 55 percent higher as part of the transition from divestiture.)

REGULATION: The change in access charges takes effect in each city at the same time the independent long-distance companies get "equal access" to local customers. That means telephone customers can choose among various long-distance carriers and tell their local phone company which one they wish to use. So by dialing "1" plus an area code, the customer automatically hooks into GTE Sprint service, AT&T, or whatever. Previously, the call went directly to AT&T unless the caller dialed a long string of extra digits to get into another network. Equal access, a result of the Bell divestiture, will reach every community by 1986.

The Bell System breakup also left a gaping hole in local phone company revenues that they are already trying to fill, primarily by raising rates for local services. In addition, local phone companies will be pressing for permission to provide lucrative "value-added" services (such as data processing for phone customers) that are now placed off-limits by the FCC. Naturally, phone companies want to raise rates *and* enter new fields. They're betting they can score on both counts.

KEN ZITA

We've declared total war...



Bacteria in lab dish (1) elongate after addition of piperacillin, a new antibiotic (2); the cell wall of the microorganism weakens (3), then ruptures and dies (4).

...on infectious diseases.

Infectious diseases are the enemy—ranking fifth among the leading causes of death in the United States. More than two million people require hospital treatment each year for a wide variety of infections, adding an extra $1.5 billion in hospitalization costs alone to our country's already staggering health-care bill.

Not only do these disease-causing invaders strike swiftly and severely when the body's defenses are weak, but over the years new strains of many bacteria have appeared—strains that are resistant to many existing medications.

Fortunately, research scientists have developed a new generation of antibiotics, including a semi-synthetic penicillin (whose bacterial action is pictured above), to battle against a broad spectrum of life-threatening microorganisms. These rapid-acting antibiotics provide physicians with powerful new weapons for their medical arsenals.

But the war against infectious diseases continues and our search for even newer, more effective medications goes on.

Lederle

For more information about Lederle's antibiotics research and general background material, call or write: Public Affairs Department, Lederle Laboratories, Wayne New Jersey 07470, 201/831-4684.

CELLULAR RADIO:

MOBILE PHONES IN THE FAST LANE

A year ago, cellular radio—the technology that makes phoning from your car almost routine—was a great idea whose time was about to come. Now it has come. Lawyers and business executives who had agonized over wasted minutes on the road are now beginning conversations with, "I'm calling from the Bruckner Expressway."

Giant companies, eager for franchises from the Federal Communications Commission, are wheeling, dealing, and haggling like so many commodities brokers. Cellular is enjoying a terrifically healthy infancy.

Mobile phone service itself is not new. But until cellular radio came along and solved the capacity problem (see box), users had pounded their dashboards in frustration as they got the inevitable busy signal. With cellular, mobile service suddenly made sense, not for thousands of customers, but for millions. In 1981 the FCC approved the new technology, and on October 13, 1983, in Chicago, Ameritech, the midwestern Bell company, began offering the first commercial cellular service. By the end of 1984 about two dozen of the nation's largest cities were scheduled to have cellular.

MARKETPLACE: The major question for the cellular market is: How big? By 1990, according to some studies, cellular radio may be an $8 billion business. Much of that money will go to whichever firms win licenses from the FCC, especially in the largest markets. Coming in second isn't worth anything, so competitors have been behaving like the Italian city-states of old, alternately attacking and allying with one another. One New York firm, LIN Broadcasting, for example, has won franchises in four cities with four different alliances. "When you're giving something away for nothing," points out Myron Peck, deputy chief of the FCC's mobile services division, "everybody wants it, and they'll leave no stone unturned to get it."

For example, the moment the FCC awards a franchise to one alliance the losers challenge the award, thus eating up valuable time with FCC hearings. That time is critical to big cellular players like LIN, MCI, and Metromedia, since the FCC, in order to put cellular radio on the road as quickly as possible, decided to award one franchise in each city to phone ("wireline") companies. These companies, the FCC reasoned, already know how to operate phone systems. The phone companies banded together to avoid the lengthy challenge phase, getting a head start almost everywhere. The advantage is all too calculable. NYNEX, the wireline company in New York, expects to have 13,000 cellular customers by June 1985, just one year after it started up. LIN, meanwhile, is still glumly awaiting the FCC's final clearance.

For consumers the competition can only be helpful. Already the price of the phone itself has come down from $2,800 to as low as $1,600. Some franchise hopefuls have promised service for as little as $4.50 a month, though $40 to $50 is closer to the norm. Including the calls themselves, the average monthly cost of cellular service is expected to run $150 or more.

REGULATION: The FCC concedes that it was taken by surprise by the staggering response to its request for cellular applications. Several firms hoping for franchises in the largest markets delivered their applications in truckloads, while even the smallest markets—numbers 90 through 120—attracted an incredible 5,200 applications. After awarding franchises in the 30 largest markets by merit, the commission decided to save time by apportioning the rest in lotteries. Meanwhile, according to Myron Peck, it has been judging license challenges.

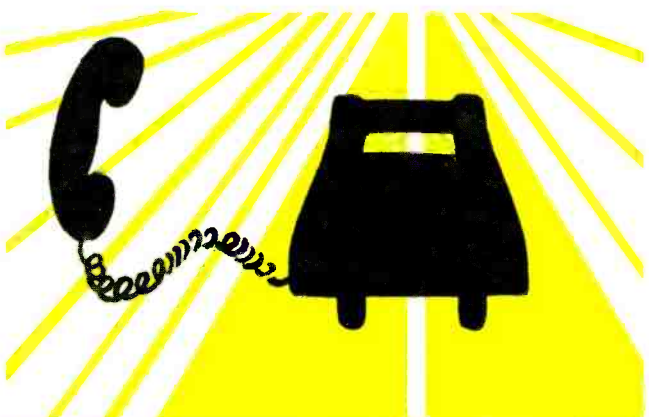
TECHNOLOGY: The next major advance in cellular technology is likely to be the truly portable phone, usable anywhere within range of a cellular tower. Current models suffer from weak batteries, which run out after a 30-minute conversation, and a better version is several years away.

A cheaper, if less convenient, alternative to cellular already exists in the familiar form of the beepers that repairmen or doctors often wear. New models of pagers not only beep but display short messages and phone numbers. And a recent FCC decision will allow pagers, unlike cellular phones, to operate beyond their home cities. In August the FCC awarded three licenses for a nationwide satellite paging service. Those licenses also have been challenged, of course, so satellite paging may not be available until 1986. Approximately three million people currently use local paging, and the satellite paging industry expects to attract 15 to 20 percent of those customers.

JAMES TRAUB

CALLING ALL CARS

Before the advent of cellular radio technology, mobile telephone users made and received calls through a single tower serving a 75-mile radius. Only 12 calls could be made at once in a single city, and static was always a problem. With cellular radio a city is divided up into any number of units, or cells, each with its own short-range receiving/transmitting tower. When the travelling user passes from one cell to another, his call is automatically "handed off" by a computerized switching device to the tower serving the next cell. In this way callers in different areas of a city may use the same frequency at the same time. In addition to adopting the cellular approach in 1981, the FCC greatly increased the spectrum space devoted to mobile telephony. Now more than 300 calls can be made at once.



Expecting cellular to be a multi-billion-dollar business by 1990, large corporations are battling for franchises.

FIBER OPTICS:
THE LIGHT HEAVYWEIGHT

At Halloween 1984, in Birmingham, Alabama, South Central Bell switched on what it claims was the phone industry's first light-carrying cable to reach a customer's premises. But the customer, significantly, wasn't anybody's grandma—it was the state's largest bank, with huge amounts of computer data to transmit among its offices.

Matter-of-fact economics explains why giant firms increasingly use bursts of light instead of electrical impulses in their busiest communications lines. A pencil-thin bundle of glass-fiber filaments can carry the equivalent of tens of thousands of phone calls, encoded digitally in bursts of laser light, more cheaply, rapidly, and accurately than any copper cable.

Economics thus far has also kept fiber optics out of grandma's house. Copper wires still can bring in as much information as a household can absorb, says Dwight Macauley of Frost & Sullivan, a market analysis firm. For such limited telephone and television traffic, copper is still cheaper than fiber optics.

However, fiber still promises an "era of unlimited bandwidth"—vast information-receiving-and-sending capacity—according to fiber expert John Kessler. That great capacity will come home when Americans find some compelling ways to use it. For example, Kessler imagines that the home screen could be used to scan through vast libraries of information.

Such enthusiasm for fiber optics, 15 years after the first low-loss fiber was announced, is buoyed by continuing increases in fiber's capacity and decreases in its costs. Last September, AT&T Bell Labs trumpeted its latest world records. In one experiment, a fiber carried digital data at the rate of two billion bits per second—the equivalent of simultaneous transmissions over 22 television channels or 28,000 phone calls. AT&T aims to achieve nearly that rate in ordinary fiber installations by 1990. Also, the experiment transmitted data for 81 miles without reamplification along the way, while copper wires would have required repeaters every mile or two. Further transmission records are expected as researchers cook up ever-more-transparent glass and develop lasers that ever more rapidly fire bursts of infrared light.

Although its capacity has multiplied, fiber cable costs 90 percent less today than it did seven years ago—a trend stimulated by phone companies' high-volume purchases. In 1983, almost 8 percent of the nation's telephone trunk and distribution circuits were glass. And an international consortium plans to lay a fiber cable to Europe in 1987.

But engineers still find today's fiber networks annoyingly unrefined, noting that light waves must be converted back to electrical waves for switching, amplifying, and other processing. The networks are also slower than the engineers would like, so they're trying to design printed circuits of light-carrying materials, looking ahead to building a "crystal computer." Theoretically, such a device could process information a trillion times faster than today's speediest electronic computer—if the heat it generated didn't melt the whole thing first.

STEVE BEHRENS

Fiber can provide unlimited bandwith and cheap transmission, but first it has to find a compelling everyday use.

PLAYERS:
POWERS THAT BE

Although hundreds of companies are actively involved with the new communications technologies, most of the major prospecting is being done by a relative handful—the familiar media conglomerates in broadcasting, publishing, and motion pictures. With their huge financial resources and mass-media expertise, these companies range all over the field, many of them involved with the ownership of delivery systems as well as with programming. The companies listed here are the players dominating that field.

	ABC	CBS	RCA	Time Inc.	Westinghouse (Group W)	Capital Cities Communications Inc.
BROADCAST & CABLE REVENUE FOR 1983‡	$3,627.7	$2,389.4	$2,090.0	$1,090.0	$802.4	$762.3
% OF REVENUE FROM MEDIA	95.5%	59.1%	23.3%	82.3%	.9%	100%
TV NETWORKS	ABC	CBS	NBC			
BASIC CABLE SERVICES	*Arts & Entertainment, *Lifetime, *ESPN		*Arts & Entertainment	*USA Network, *Black Entertainment Television	Nashville Network	
PAY TV SERVICES	*First Ticket, RSVP (pay-per-view)			Home Box Office, Cinemax	Home Theater Network, *Event TeleVision (pay-per-view)	
TV-FILM PROGRAM PRODUCTION	ABC-TV, ABC Motion Pictures	CBS-TV, CBS Theatrical Films, *Tri-Star	NBC-TV, NBC Productions	Orion Pictures (part-interest), *Tri-Star	Group W Productions	Capital Cities Television Productions
VIDEO CASSETTE DISTRIBUTION	ABC Video Enterprises	*CBS/Fox Home Video	NBC Int'l, *RCA/Columbia Int'l. Video	Time-Life Video		
INTERACTIVE CABLE						
VIDEOTEX/ TELETEXT		Trintex Videotex, Extravision Teletext	RCA Videotex, NBC Teletext			Startext Videotex
PROGRAM SYNDICATION		CBS International	NBC Enterprises		Television Syndication Center	
RADIO NETWORKS	7ABC networks	2 CBS networks	3 NBC networks			
TV STATION OWNERSHIP	7 VHF	5 VHF	5 VHF		5 VHF	5 VHF, 2 UHF
CABLE SYSTEM OWNERSHIP (number of subscribers in millions)		Black Hawk Cable (.020)		ATC (4.6)	Group W Cable (3.6)	Capital Cities Cable (.616)
SATELLITE TRANSPONDERS	Telstar 301, 302 Westar 4, Galaxy 1, Satcom 1R, 3R, 4	Westar 5	Satcom 4	Satcom 3R, 4 Galaxy 1	Galaxy 1 Satcom 3R	
RADIO STATIONS	6 AM, 7 FM	6 AM, 7 FM	3 AM, 5 FM		6 AM, 5 FM	6 AM, 6 FM

‡Total revenues in millions. Source: *Advertising Age.*

*Co-ventures. (**Tri-Star:** CBS, HBO & Columbia; **Arts & Entertainment:** Hearst, ABC & RCA, **ESPN:** ABC & Nabisco; **Lifetime:** ABC, Hearst & Viacom; **USA:** Time, Paramount & RCA; **Black Entertainment Network:** Robert L. Johnson, TCI, Taft & HBO; **Showtime & The Movie Channel:** Warner Communications, Warner Amex & Viacom; **Bravo & American Movie Classics:** Cablevision, Daniels & Associates & Cox Cable, **First Ticket:** ABC & Cox; **Trintex:** CBS, IBM & Sears; **AP News Plus:** Associated Press & Tribune Company; **Warner Amex:** Warner Bros. & American Express; **Event TeleVision:** Group W Cable, Warner Amex Cable, ATC, TCI & Caesars World Productions.)

	Cox	Storer Communications	Metromedia	Tele-Communications Inc. (TCI)	Viacom	Times Mirror	Tribune Co.	Warner Communications	Turner Broadcasting Co.	Taft
	$537.6	$458.9	$371.6	$347.3	$271.3	$270.1	$259.0	$219.0	$201.3	$140.8
	87.5%	100%	69.7%	94%	86.0%	66.9%	88.1%	7.3%	89.7%	37.0%
				*Black Entertainment Television	*Lifetime		WGN, WPIX, *AP News Plus	MTV, Nickelodeon	CNN, CNN Headline News, WTBS, CMC	*Black Entertainment Television
	*First Ticket, *Bravo, American Movie Classics			Data Cable Express *Event TeleVision (pay-per-view)	*Showtime, *The Movie Channel			*Showtime, *The Movie Channel, *Event TeleVision		
	TeleRep	Storer Communications	Metromedia Producers Corp., Metromedia Television	National Telefilms Associates, *TCI/Taft Programs	Viacom Productions		Tribune Entertainment	Warner Bros., Warner Bros. TV	Turner Program Services	Taft Entertainment Co., *TCI/Taft Programs
					Viacom Enterprises			Warner Home Video		Worldvision Enterprises
		Cable Protection Systems			Viacom Worldwide			*Warner Amex Qube		
	Indax Videotex			Teletext Services Inc.		Gateway Videotex	Video-Guide Teletext			Electra Teletext
			Metromedia Producers Corp.		Viacom Enterprises		Tribune Entertainment	Warner Bros. TV	Turner Program Services	
			Texas State (1 network)						CNN Radio Network	
	5 VHF, 2 UHF	5 VHF, 2 UHF	4 VHF, 3 UHF		3 VHF, 1 UHF	5 VHF, 2 UHF	3 VHF, 2 UHF	5 VHF, 1 UHF	1 HF	5 VHF, 2 UHF
	Cox Cable (3.1)	Storer Cable (2.8)		TCI Cable (4.7)	Viacom Cable (1.4)	Times Mirror Cable (1.8)	Tribune Cable (.098)	*Warner Amex Cable (2.6)		*TCI/Taft Cablevision Associates (.098)
	Westar 4, 5 Telstar 301			Westar 5	Galaxy 1 Satcom 3R, 5			Satcom 3R, 4	Satcom 3R Galaxy 1 Westar 3, 4	Westar 5
	5 AM, 7 FM		5 AM 6 FM		2 AM, 5 FM		3 AM, 2 FM			6 AM, 7 FM

PROGRAMMING AND INFORMATION SERVICES

DISTRIBUTION SYSTEMS

IF YOU SEE O
YOU'VE SEEN 'EM ALL
WELL, THAT'S A

NE "EMMY" .. BUT IF YOU SEE 21... NOTHER STORY.

It's called "The Philadelphia EMMY Story."

The opening act took place on stage at the 2nd Annual EMMY Awards Presentation in the historic and beautiful "City of Brotherly Love." And what an historic and beautiful night it was for Group W's KYW-TV, Channel 3.

This remarkably talented and happy cast of characters (*shown here*) with the supporting cast of all the other people at KYW-TV (*talented and happy, too...but regretfully not shown here*) stole the show—upstaging all other competition by winning 21 out of 31 EMMY categories.

You could say this year's performance by KYW-TV helped close the curtain on a magical year of unprecedented individual and program accomplishments.

OUTSTANDING INDIVIDUAL ACHIEVEMENT—ANCHOR
Jerry Penacoli
OUTSTANDING SPOT NEWS
"Waiting for Word," Marge Pala
OUTSTANDING FEATURE NEWS
"Little Heroes,"
Mike Willmann and Dave Patterson
OUTSTANDING SERVICE NEWS
"X-Rays: Use Extreme Caution," Diane Allen
OUTSTANDING INVESTIGATIVE JOURNALISM
"One Man: His Dream, Your Money," I-Team
OUTSTANDING TALK PROGRAM
"People Are Talking/Hermaphroditism,"
Pamela Browne
OUTSTANDING ENTERTAINMENT SPECIAL
"Rock 'N Reality," James Cory Anderson
OUTSTANDING MAGAZINE FORMAT
"Rock 'N Reality," James Cory Anderson
OUTSTANDING PROGRAMMING FEATURE
"Dieting for Dollars/Satisfaction Guaranteed,"
Cynthia Fenneman
OUTSTANDING LIVE PROGRAMMING
"People Are Talking/White Collar Cocaine Addicts,"
Pamela Browne
OUTSTANDING PUBLIC SERVICE ANNOUNCEMENT—CAMPAIGN
"The Album of Black History," Stan Gibell
OUTSTANDING PROMOTIONAL ANNOUNCEMENT—SPOT
"Without A Home," H. Brian O'Neill
OUTSTANDING PROMOTIONAL ANNOUNCEMENT—CAMPAIGN
"When You Believe In Yourself," H. Brian O'Neill
OUTSTANDING STATION EDITORIAL
"Out in the Cold" Series, Pat Polillo, Jennifer Balick
OUTSTANDING INDIVIDUAL ACHIEVEMENT—HOST
(Not Shown) Vincent Price
OUTSTANDING INDIVIDUAL ACHIEVEMENT—ACTOR
(Not Shown) Jeff DeHart
OUTSTANDING INDIVIDUAL ACHIEVEMENT—ARTISTIC DIRECTOR
Peter W. Moyer
OUTSTANDING INDIVIDUAL ACHIEVEMENT—WRITER
Nancy Glass
OUTSTANDING INDIVIDUAL ACHIEVEMENT—TAPE/FILM CAMERA
John L. Wills
OUTSTANDING INDIVIDUAL ACHIEVEMENT—TAPE/FILM EDITOR
Ira F. G. Raider
OUTSTANDING INDIVIDUAL ACHIEVEMENT—LIGHTING DIRECTOR
Manny Whitaker

GROUP W
KYW-TV 3

An occupational hazard

What promises to be a landmark case in the field of libel law began unfolding in the Federal District Court in New York recently. General William C. Westmoreland, who commanded U.S. forces in Vietnam from 1964 to 1968, is suing CBS for $120 million (which he will donate to charity if he wins), charging he was libeled by the CBS documentary, "The Uncounted Enemy: A Vietnam Deception," shown on January 23, 1982. Other defendants, in addition to CBS, are Mike Wallace, the interviewer on the show; George Crile, the producer; and Samuel A. Adams, a former Central Intelligence Agency analyst who served as a consultant.

We don't know whether CBS and the individuals involved did indeed libel General Westmoreland, nor do we intend to comment on the details of the case. Rather, our concern is with a seemingly ancillary issue we feel actually transcends in importance the case itself—the right of an individual like General Westmoreland to have his day in court, and to be able to present his case fairly without undue legal obstacles to his success.

General Westmoreland had a distinguished 36-year military career. He was an infantry officer in World War II; in Korea he led paratroops, and at 42 was the youngest major general in the Army. He was superintendent of West Point at 46, and wound up his career, after his Vietnam command, as Army Chief of Staff. His service to this country won him the Distinguished Service Medal, Bronze Star, Legion of Merit, and Air Medal. It also won him, during his career, the status of a "public official." What it did not win him was great wealth. Army officers seldom get rich.

So General Westmoreland, feeling that the reputation he had established during 36 years of public service had been left in tatters by the telecast, turned to the courts for redress. In doing so, he faced two major hurdles:

- The U.S. Supreme Court has ruled that public officials and public figures (generals, mayors, congressmen, prominent businessmen and actors have been held to fit these categories) must prove, in libel cases, that the statements made about them were false. They must also prove that the parties defaming them did so knowing the statements were false or made "with reckless disregard" of whether they were false or not. This is a much greater burden of proof than the ordinary citizen has, who is only required to prove negligent falsity.

- The General's second obstacle was the nature of his opponent—a major corporation with deep pockets (presumably including libel insurance) well able to afford teams of lawyers and other counsel. Legal expenses in the case have so far totaled almost $4 million.

Representing General Westmoreland is the Capital Legal Foundation, a public-interest law firm supported largely by grants from foundations and individuals. We don't know if their resources are adequate to provide General Westmoreland with the kind of representation to which he—and any other citizen—is entitled. We understand that private citizens, Vietnam veterans' organizations (with which General Westmoreland is not associated), and foundations have contributed to the Capital Legal Foundation's efforts on his behalf. If you wish to join this effort, send a check to the foundation at 700 E Street, S.E., Washington, D.C. 20003.

But what about other public officials, some of whom serve in relatively humble posts? Their positions may make them ready targets for libel, but the heavy burden of proof they face makes them second-class citizens.

How to make justice more readily attainable? In the best of all possible worlds, the U.S. Supreme Court would redefine the standards it applies to public officials and public figures. Other industrialized nations, such as the United Kingdom, don't apply such heavy burdens of proof in libel cases. But in the practical world, why not simply recognize that public officials face an occupational hazard—libel? And why not deal with it just as we deal with so many other hazards of the workplace?

Employers now provide medical insurance, dental insurance, workmen's compensation insurance, and disability insurance. We believe all public officials—generals, admirals, firemen, police officers, rubbish collectors—should be covered by insurance to allow them to sue for libel. Perhaps the employers should pay the premium (we at Mobil have taken out such insurance on behalf of key employees). Or perhaps the system should be government-financed, since the government, through its judicial arm, has stripped public officials of some of their civil rights.

No one should have the rights of citizenship diminished because he plays an active role in the system. That should be the lasting lesson of the Westmoreland case.

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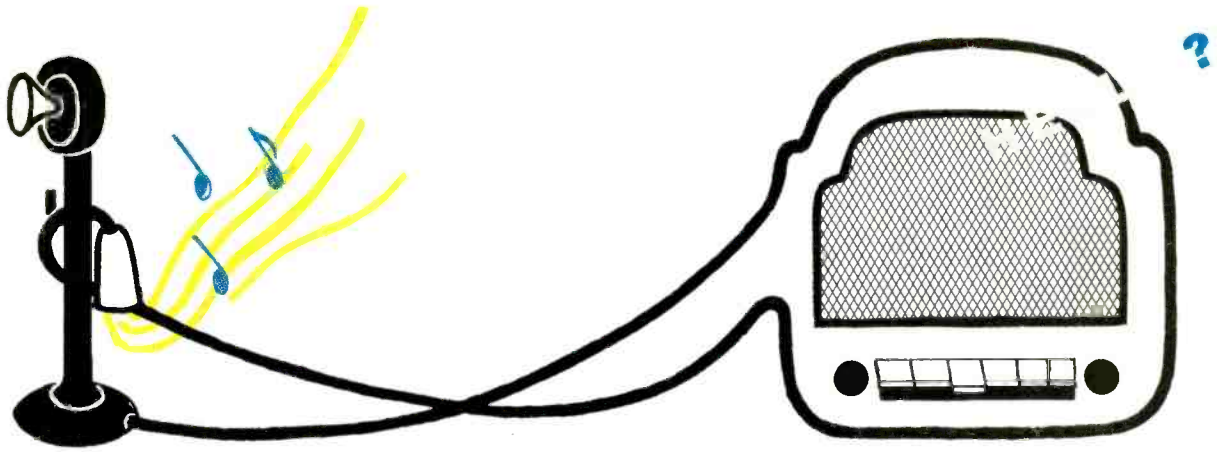
CONTEXT:

REMEMBERING THE FUTURE



BY DANIEL CZITROM

Today's feverish speculations about new communications technologies are only variations, slightly wised-up, on what people were saying when the *old* technologies were new. It's comforting to know that the coming of new media has always, not just recently, overexcited some people and stimulated predictions that were just plain wrong.

RCA, to cite a recent example of faulty foresight, seems to have misconceived the video disc as a mass medium for bringing movies to consumers instead of the specialized interactive medium it is turning out to be. But that expensive misjudgment was no further from the mark than many early notions about the telegraph, telephone, or radio.

Even Thomas Edison, who was usually adept at exploiting inventions, did not initially anticipate music recording to be the prime use of his phonograph. He built the wax-cylinder recorder to serve as a kind of telephone answering machine, receiving calls at a convenient office for people who didn't have phones at home. He also expected it would be used to preserve the voices of the dead.

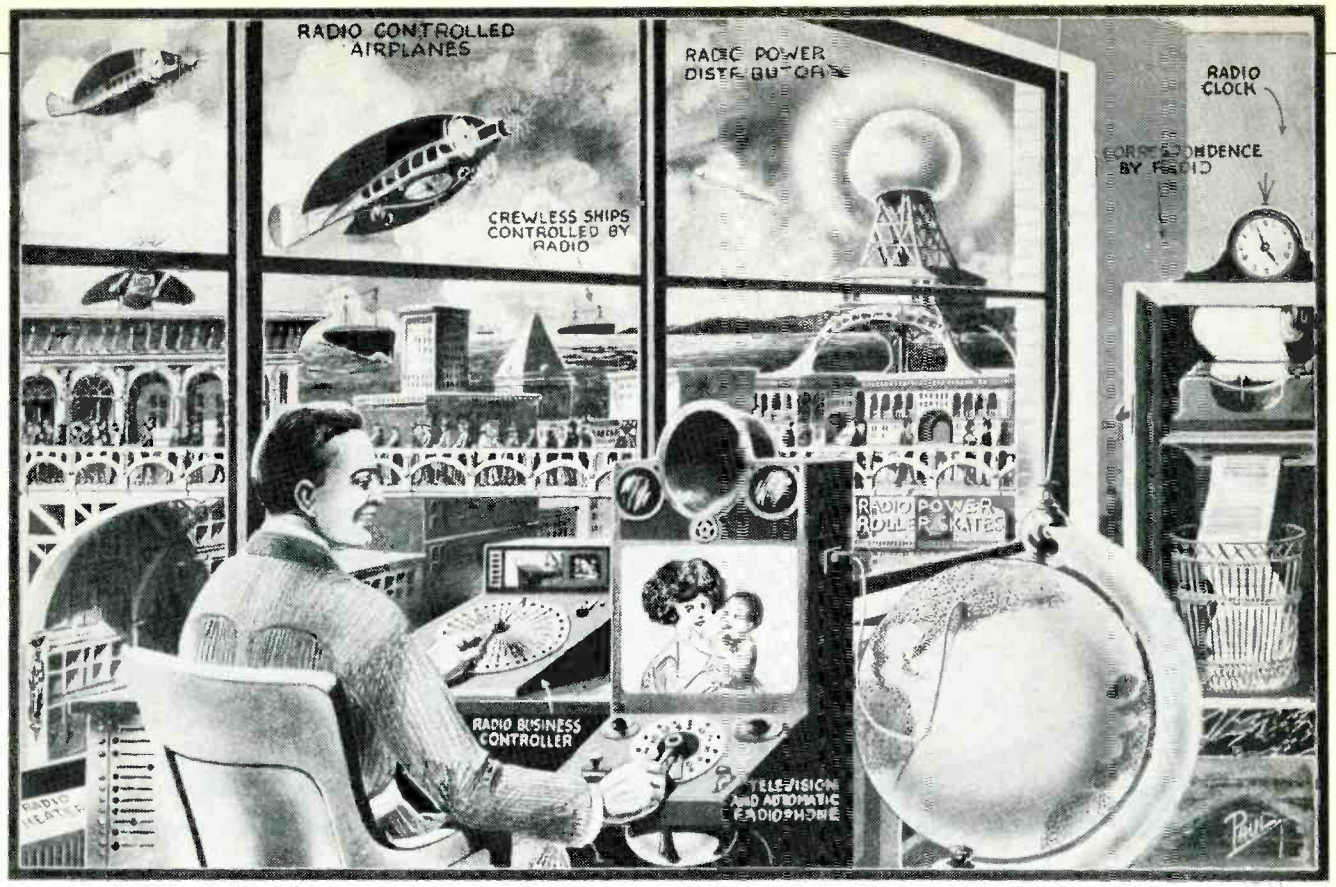
There were prophets who expected the telephone to be used as a mass medium. In 1877, the year after Alexander Graham Bell put together his telephone, a Massachusetts newspaper predicted it would be used to popularize music and transmit news reports. That was even tried some years later in Budapest without success.

Other seers thought radio would be used for personal conversation (a use that may become common only in the 1980s with the coming of cellular radio). Many agreed with the 1901 prediction of engineer William Ayrton: "If a person wanted to call a friend he knew not where, he would call in a loud, electro-magnetic voice, heard by him who had the electro-magnetic ear, silent to him who had it not. 'Where are you?' he would say. A small reply would come, 'I am at the bottom of a coal mine, or crossing the Andes, or in the middle of the Pacific.'"

To many Americans in the early 1920s, the emergence of broadcasting as the foremost use of radio came as a shock. The consensus among experts had been that radio would be employed for marine communication and as a subordinate technology serving long-distance telephone. Radio manufacturers went into broadcasting in order to sell receivers. In 1924 David Sarnoff, head of RCA, envisioned a broadcast service funded by receiver manufacturers and dealers, and transmitted by six "super power broadcast stations" that would blanket the country.

It didn't develop that way, however. Broadcasting took an odd route to become the advertiser-supported mass medium we know today. From the earliest years of the telephone, Bell himself had correctly anticipated aspects of the "universal service" that the phone came to provide, but in AT&T's desire to control radio broadcasting as well, it misjudged slightly how the industry would be structured. AT&T, which already had the landlines to form a network, wanted to operate "toll broadcasting" on the common-carrier model of the telephone, and carry programs for paying clients. It began selling air time on its New York station in 1922, and while that practice continues in the industry today, broadcast sta-

Few of the old technologies developed according to the original vision for them, and large, savvy companies made gambles that were dead wrong.



FROM *RADIO FOR ALL*, BY HUGO GERNSBACK, 1922

Some of the "future wonders of radio," depicted by an artist in 1922 (above) never really came to pass, such as remote-controlled ships and radio-powered roller skates. Even Thomas Edison (with early dictating machine, right) initially missed the phonograph's musical promise. But Alexander Graham Bell (above, right) was quick to foresee universal telephone service.

tions came to control their schedules, and they never developed as telephone-style common carriers.

However, the notion of a mass medium operated like a common carrier lingers in the minds of phone companies and media theorists. It remains enough of a threat to the cable television industry, for example, that Congress was persuaded in October 1984 to ban phone companies from operating cable systems in their service areas.

Many utopian futures have been associated with cable television, but the 1970's cornucopian prophecies were no more hyperbolic than those inspired by the telegraph. In fact, as early as 1838, the electric telegraph's inventor, Samuel Morse, anticipated 20th-century notions of a "global village." In trying to convince Congress to help build a telegraph system, he said it would not be long before the electrical nerves could "diffuse, with the speed of thought, a knowledge of all that is occurring throughout the land; making, in fact, one neighborhood of the whole country."

"Lightning lines" were built rather quickly around the country (by private enterprise, not by Congress as Morse had hoped), and the public greeted them with pride, sheer wonder, incredulity, and some fear. It was a common sentiment that the "annihilator of space and time" had an incalculable, mystical significance that elevated mankind a few rungs in the order of nature. When the first transatlantic cable was completed in the summer of 1858, there were bonfires and fireworks around the country, and New York City held what was its largest parade to date.

The telegrapn's effect as a sublime moral force remains incalculable, but it clearly had major effects on commerce and journalism. Along with the railroad, it helped to create a truly national economy. And it made possible large-scale cooperative newsgathering and the rapid transmission of news. For the first time, news from other cities was still new when it was printed in newspapers. Indeed, Western Union and the Associated Press together rose to create a double-barreled monopoly in their respective fields through a series of exclusive contracts. Reformers demanded that the companies be curbed. "The power of the telegraph can scarcely be estimated," concluded a Senate committee in 1874. But

THE BETTMANN ARCHIVE

the accent by then was not on the telegraph's power for good; it was on the dangerous power of monopolies.

Like new tech today, old tech had its shakeouts and corporate casualties. There were three decades of wildcat speculation and erratic construction of telegraph lines before Western Union emerged with a virtual monopoly in the 1870s. And a handful of major companies divvied up the radio business among themselves: General Electric, Westinghouse, and AT&T jointly created RCA to make receivers, and RCA later established NBC to run two radio networks. AT&T abandoned station ownership to concentrate on operating land lines for networking.

The tendency toward monopoly and oligopoly continues, as in IBM's aggressive dominance of the computer business. But the public has always had a countervailing tendency to do with new tech what it pleases, not necessarily what the corporations have in mind. In the first two decades of the century, an active population of radio amateurs helped legitimize the public's claim to the airwaves, which Congress adopted in the 1927 act establishing the Federal Radio Commission. As one radio fan wrote in 1924: "It is a sport in which your wits, learning, and resourcefulness are matched against the endless perversity of the elements." They thrilled in the medium itself, more than in its practical application. In that way and others, they were like many of the computer "hackers" of today: an informed public of amateur specialists skeptical of corporate motives and plans.

Direct broadcast satellites were conceived by big corporations as a highly centralized means of earning pay-television revenues from the public, but hundreds of thousands of Americans didn't wait for DBS service to begin. They've run away with the idea, installing earth stations in their yards. Instead of getting a schedule programmed by a DBS company and paying a monthly fee for it, they're choosing from among dozens of channels coming free through the ozone. Likewise, viewers are showing how much they value their independence by using their video cassette recorders to gain access to their own choice of programs, particularly through cassette rentals.

We probably wouldn't have predicted these things 10 years ago, with even the closest reading of media history, but we could have easily anticipated today's corporate free-for-all, and the wild card of public reaction that we're trying to understand now.

WHAT'S WHAT

GLOSSARY OF TECHNICAL TERMS & INITIALS

Addressability: the ability of a cable system or STV broadcaster to turn an individual subscriber's service on and off by remote control, thus facilitating pay-per-view programs.

Alphanumeric: referring to letters and numerals on a TV screen, as in teletext and videotex.

Analog/digital: two basic types of electronic communications signals. An analog signal is continuously varied in quantity, such as voltage, to represent variations in another quantity, such as loudness of a voice or brightness of a picture. The signal is, therefore, "analogous" to the information it carries. Most broadcasts and recordings today are analog, but increasingly they use the digital language of computers. In digital techniques, pictures, sound, or computer data are represented by a binary code of "on" and "off" signals. Since this system ignores everything but those two signals, it is more precise and less susceptible to interference than analog.

Aspect ratio: the ratio of a picture tube's, or movie screen's, width to its height. Wide-screen movies, with ratios of about 5:3, suffer when broadcast at television's 4:3 ratio. Most plans for high-definition TV would use a 5:3 ratio.

Basic cable: the minimum cable service subscribers receive for a monthly fee.

Baud: a measure of a computer modem's transmission speed, equal to bits per second.

Beta: one of two incompatible video-cassette recorder (VCR) formats using half-inch tape. The other, more popular, format is called VHS.

Bit/byte: bit is short for "binary digit," the smallest unit of information in a computer ("0" or "1"). A byte is a group of bits, usually eight, handled as a unit, that stores a piece of information such as a character. Computer memory is measured in bytes: "64K" means a computer has 64 kilobytes, or 64,000 bytes.

Blue sky: a pejorative term for overly optimistic or unrealistic expectations or promises.

Broadband: referring to a great bandwidth of frequencies, adequate for TV transmission or multiple audio circuits. A coaxial cable has broadband capacity; a telephone line does not.

C-band: the range of frequencies, from 4 to 6 gigahertz, on which most communications satellites receive and transmit signals.

Churn: industry jargon for the disturbing rate at which subscribers cancel a service, such as basic or pay cable.

Common carrier: a communications form that offers its services to the public, and is regulated by the FCC. Ownership of the medium is divorced from control of the messages carried. Telephone is a common carrier; broadcast television is not.

CRT: Cathode Ray Tube, used for display of television pictures or computer information.

Cycles per second: the number of complete performances of a vibration, electrical oscillation, current alternation, or periodic process. The measure used for radio frequencies. See "Hertz."

Dedicated: characteristic of a machine or system used only for one function; for example, a computer that serves as a dedicated word-processing system.

Digital: (See "Analog/digital.")

Dish: colloquial for "earth station," an umbrella-shaped antenna that sends or receives satellite transmissions.

Downlink/uplink: jargon for a satellite earth station for receiving (downlink) or sending (uplink) satellite signals. (If it cannot also uplink, the antenna is a TVRO—Television Receive Only.) Also used as a verb.

Downloading: process of transmitting data, computer software, or even a movie, for recording at the other end of the line. Downloading is often scheduled at the convenience of the sender, but the recording can be played back at the convenience of the recipient. ABC's defunct TeleFirst pay-TV service downloaded movies to subscribers' VCRs using scrambled broadcasting at night. Other services seek to download video games to subscribers' home computers.

Downstream/upstream: industry jargon indicating whether a signal is travelling from the distribution center to the subscriber (downstream) or in the opposite direction.

Footprint: the geographic area in which a given satellite transponder's signal can be received. Different transponders on a satellite often have different footprints.

Geostationary orbit: satellite path 22,300 miles above the equator, where a satellite's position relative to the earth remains constant because its speed matches the earth's rotation.

Hardwired: equipment with a permanently installed program to direct its functioning—for example, a computer with software built into its circuits.

Headend: a cable television system's control center where incoming signals are received, processed, and put on outgoing channels.

Hertz (Hz): cycles per second; a measure of electromagnetic frequency that represents one cycle, or complete wave, per second. One kilohertz (kHz) is 1,000 cycles per second; one megahertz (MHz), one million; and one gigahertz (GHz), one billion.

Interactive: referring to those technologies that permit user participation, such as two-way cable, videotex, and certain optical video discs.

ITFS: Instructional Television Fixed Service—a group of TV channels in the ultra-high frequency range, set aside for educational use. ITFS is technically identical to Multipoint Distribution Service (MDS).

Ku-band: the range of frequencies, from 11 to 14 gigahertz, on which the next generation of communications satellites—including direct-broadcast satellites—will receive and transmit signals.

Laser: acronym for Light Amplification by Stimulated Emission of Radiation—a device that emits an extremely narrow beam of light, used in fiber optics and

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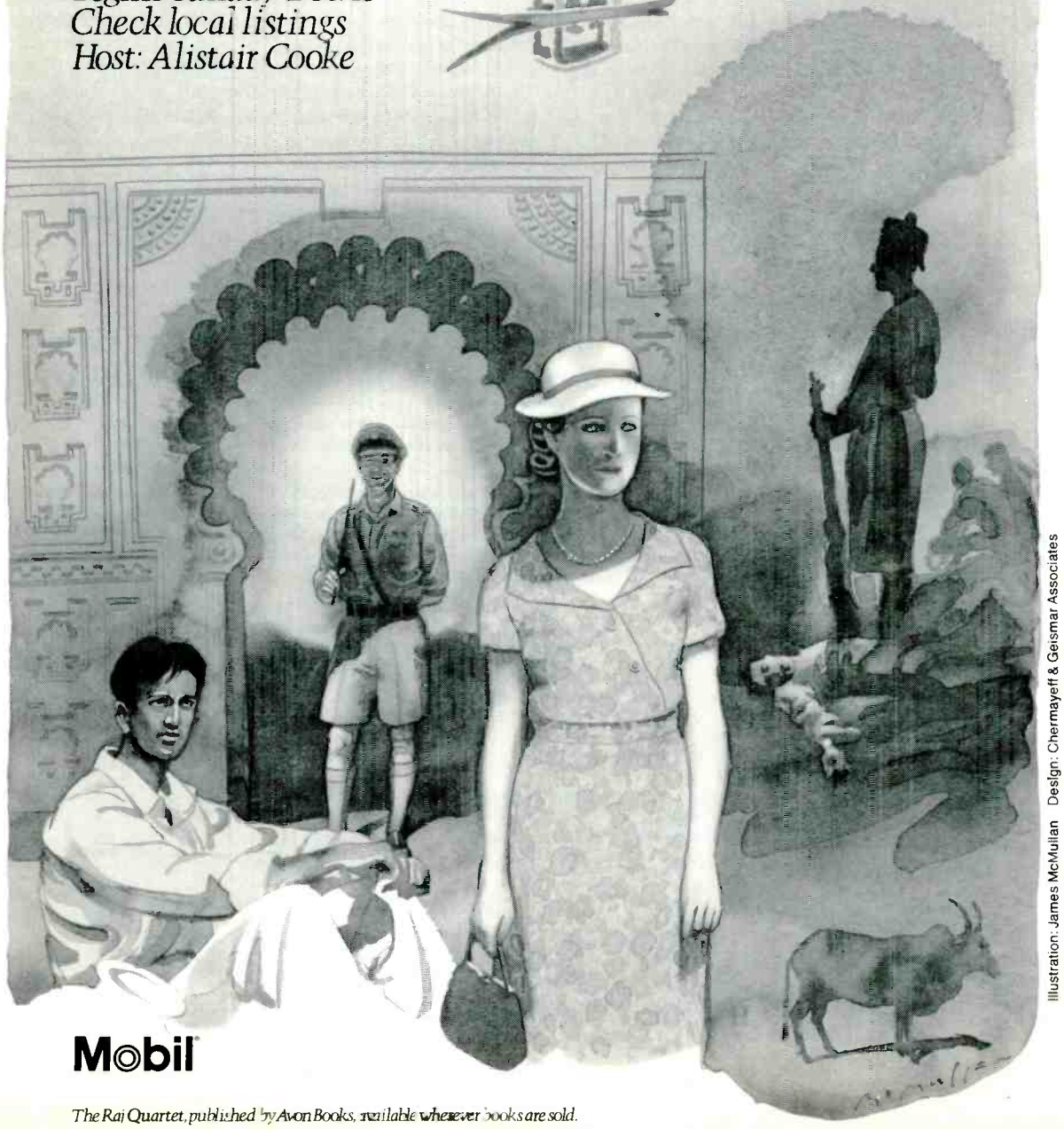

Mobil

The Raj Quartet, published by Avon Books, available wherever books are sold.

Illustration: James McMullan Design: Chermayeff & Geismar Associates

optical video discs.

Leased access: the use of cable channels for leasing to independent commercial programmers.

Microprocessor: the heart of a computer, a silicon chip that processes data and controls a computer's components, including the memory, keyboard, display, and disc drives.

Modem: a contraction of "modulator-demodulator," a device that lets computers and other digital devices communicate over analog media such as telephone lines.

Mouse: a palm-sized computer input device that when moved on a tabletop causes corresponding movements of the computer's cursor on the screen. It can supplement or even replace the keyboard for some functions.

Must-Carry Rule: an FCC requirement that a cable system transmit to subscribers all full-powered TV stations in its area.

Narrowcasting: aiming programs at a specific audience.

MSO: Multiple System Operator, a cable company that owns more than one system.

Multiplexing: various means of squeezing a number of TV programs or other transmissions into a single broadcast channel, cable, or other electronic path.

NTSC: National Television System Committee, the group that devised the technical standard for color television adopted in the U.S. in 1953, and later in Canada, Japan, and several other nations. (PAL and SECAM, developed in Europe, are two other major standards.)

Penetration: in a given population, percentage of households using a product or service.

Public access: the use of cable channels by members of the community at no charge.

RFP: request for proposals—in cable franchising, a government invitation for bids to operate a local system.

SCA/subcarrier: Subsidiary Communications Authorization—FCC permission granted to a radio station to use subcarriers in the FM channel to piggyback material, often computer data, readings for the blind, or background music services. Stations frequently lease subcarriers to other companies. The initials are also used to mean the subcarrier itself, part of the FM signal that cannot be received by an ordinary radio.

Scrambling: altering a TV picture or other transmission so it can't be properly received without a decoder.

Smart: as in a "smart terminal"—having built-in data-processing ability. A "smart building" is wired to provide computer and communications services to tenants. Without such features, it is "dumb."

Superstation: a local TV station whose signal is available by satellite relay to cable systems across the country. WTBS, Atlanta, is the original.

Teleport: a cluster of satellite antennas built as an electronic gateway or "port" for a region.

Tier: an optional cable channel or set of channels for which the subscriber pays an extra fee.

Translator: a low-power transmitter that retransmits the signal of a distant TV or radio station in an area with poor reception.

Transparent: referring to a communications device or network that (1) does not degrade a signal that passes through it, or that (2) is extremely unobtrusive and easy to use.

VBI: Vertical Blanking Interval—21 lines in the TV signal that aren't used to carry pictures. When a TV picture rolls, the VBI appears as a heavy black line. Tiny blips of moving light along some of those lines indicate the encoded presence of teletext or closed-captions for the hearing-impaired.

VHS: Video Home System, the more popular of the two videocassette formats using half-inch tape. The other is Beta.

Window: (1) computer term for subdivision of the screen to display and give access to the workings of different functions at the same time, made possible by advanced software; (2) marketing term for the period of greatest opportunity for a new service or product; (3) programming term for the period during which a network or other distributor has rights to show a program. A movie may have a pay-cable window of several months.

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