

HOME COMPUTER DIGEST

News and Happenings in the Home Computer World

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On Line

Have our science fiction fantasies come true? Is society speeding towards a head-on collision between computer technology and the needs of people? This month, *Home Computer Digest* explores the dynamic interface between those marvelous machines and their all-too-human users. Our features focus on a diverse group who are making computers a part of their lives.

Wooing the Home Computer Family explores what's behind the hardware and software industry's heightened pitch to Mom, Dad, and the kids. *Computers Enable the Disabled* reports on what electronic technology can do for people with special needs. Our look at *Celebrity Software and Software Celebrities* turns the spotlight on another group of special people who are making industry news. And the latest installment of *On the Road to Computer Literacy* brings you one step closer to a close rapport with the new machines in your future.

What's in store for us? *Why Smaller Disk Drives?* ventures some predictions on the emerging industry standards, and our *Preview of Summer's Consumer Electronics Show* takes a peek into the future of the home computer industry. And, as always, our regular features continue to bring you the last word on the present state of the home computing world.

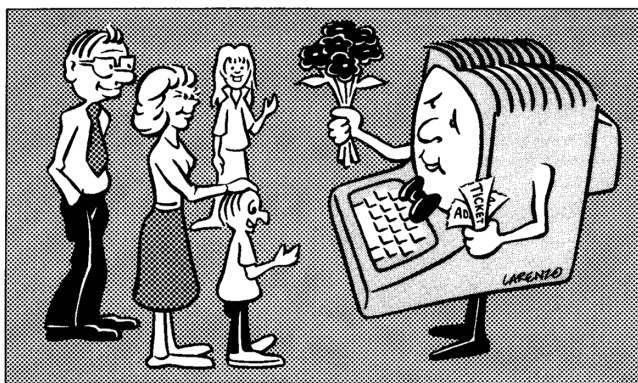
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Wooing the Home Computer Family



The time is now! Soon we'll all be needing a home computer. And just in time—computer makers from Apple to Zenith are providing us with a hardware horn of plenty. New home computers are coming out of the woodwork, and each one hits us with a new promotion angle. Ads using price slashing, rebates, guilt-trips, and even appeals to Motherhood and Apple Pie parade before us. The Home Computing Family is definitely being courted, and each suitor claims to be smarter, better-looking, more modern, and more compatible with our interests than its predecessors. All this attention from industry honchos—who hope that theirs will be the most at-home home computer—is having unexpected results that will benefit home users as much as the industry itself.

You Don't Bring Me Flowers

Although computers are not being delivered to our doors by FTD, they are turning up on the backs of cereal boxes, on discount store sales flyers, and even in mass market magazine ads and TV commercials. Look at the way the PCjr was recently introduced by IBM. The first ad that ran in a general audience publication read like a birth announce-

ment, complete with an old-fashioned baby carriage rocked by Big Daddy IBM (the Charlie Chaplin character). Below this compelling portrait (designed to grab the attention of the elusive female consumer?) was the clincher phrase, "Announcing A Proud Addition To Your Family." The magazine ad, like its television counterpart, takes you through Junior's life cycle, linking the growth of IBM's junior with the family's own flesh and blood Junior. Under the heading "GROWING UP WITH JUNIOR," the ad tells how easily you can expand the PCjr as your child's need for "a powerful tool for home, school or college" expands.

Seeing Is Believing?

With carefully selected props—overstuffed chairs, foot stools, and assorted cozy-looking antiques—IBM's TV ads visually communicate how comfortably junior fits into any home environment. These homey TV ads first aired during Super Bowl XVIII and have continued to fill prime-time slots surrounded by family-oriented specials, network news, sports, and morning talk/news shows. *Advertising Age* claims that IBM will spend about \$40 million acquainting the American family with the PCjr. Why in-

vest so much time and money in one computer? Afraid that their "big business" image will turn away PCjr purchasers, IBM hopes, by the end of the third quarter, to establish the equation: Modern Family + Computer = You + PCjr.

It Followed Her To School One Day

Along with these family-oriented magazine/TV ad campaigns, IBM and Apple are entering the home through the back door—the schools. Plans to donate 2,000 PCs and PCjrs to private and public elementary and secondary schools in more than 25 US cities will increase consumer awareness of IBM in the private sector, an important market that has been long-dominated by Apple. IBM seems to be counting on the marketing axiom that each computer placed in our schools will ultimately be responsible for selling four or five additional machines to home users.

Both IBM and Apple have commitments from universities across the country. Apple recently formed the Apple University Consortium [see "Computers In Education" in this issue.—Ed.], giving discounted equipment to member institutions in return for software research and development. IBM has fielded a new strategy to counteract Apple's consortium campaign. Many of their computers are already in place at the university level. In fact, some business and technical schools are now requiring all students to have an IBM PC. Hardware retailers have mixed reactions to the low prices. Dealers in college towns are angry with Apple for discounting its machines because none can match a 60% discount. Nevertheless, some dealers predict that the larger user base will spur software sales among students and their families.

Superior Software for Students

Not to be outdone by college software R&D, commercial educational software producers have gotten serious about creating higher quality programs. The Learning Company is field testing programs in schools and homes throughout northern California. Their testing includes observation of play, in-school interviews and questionnaires, and in-home interviews with children. The re-

vised programs then undergo a second round of testing with different children. With such extensive pre-marketing trials it is no wonder that IBM turned to The Learning Company to develop the first software for the PCjr.

While educational programs make inroads, producers of personal productivity software are kicking themselves for not anticipating the needs of home computer users sooner. But much catch-up work is underway, and we should start seeing many more home-sized versions of the popular accounting packages that were originally designed for business use. It appears that the line separating home computer from business computer concerns is fading. The cross-over is underway on both sides, as home users demand more sophisticated utility packages and business demands educational software—like the PLATO courseware—for on-the-job training and re-training programs.

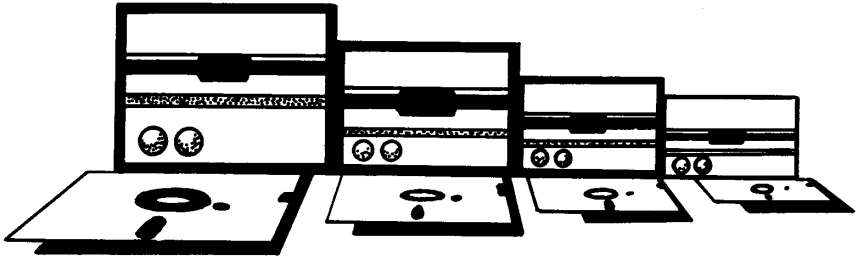
The Cycle Continues

The Home Computing Family shops for hardware and software to meet its many needs in an anxious marketplace. With weighty goals like a child's future in mind, the home computer consumer is a thorough collector of information. Hardware and software producers who are genuinely proud of their products are working to create a loyal and well-informed following.

Some manufacturers, like IBM, are trying to change their image of big business impersonality. Whether the motivation is genuine pride in their products or just profits and bigger market shares, the result is a more technologically receptive public. Ads that portray computers as friendly—even cuddly—inspire the consumer to think of the computer as more of an ally than an enemy. If the results of this careful courting of the home computing family are the demystifying of the computer, lower prices, higher quality software, better inter-industry communication, and easier access to technological information, then we have very little to lose—and much more to gain—from this newfound high-tech attention.

—*Sharyn Lyon*

Why Smaller Disk Drives?



In the past few years floppy disks have become the standard mass-storage medium in the computer industry. In the late 70's, the 8" floppy disk was the most common storage medium for mini- and micro-computers. But the 5 1/4" floppy quickly superseded the 8" as the principal storage device for microcomputers, both in business and in the home. The smaller physical size makes the 5 1/4" drive far more convenient for most applications, even though it holds less data than the 8". The 5 1/4" systems are capable of storing anywhere from 90K to 320K-bytes of data per disk, depending upon whether they support single-sided or double-sided disks, and whether data is stored on the disk using "single-density" or "double-density" encoding techniques. The 8" disk can store from 360K to more than one megabyte, depending upon the same considerations mentioned above.

More recently, "hard disk" drives (known as Winchester drives) have also come into their own. They are being used increasingly in situations where large amounts of data need to be regularly accessed. These drives are capable of storing 5 to 10 megabytes of data on a single 5 1/4" disk, but the disks are quite different from the 5 1/4" floppy. Generally, they are permanently installed in a computer system and are best suited to large data bases. Also, while ready-to-use floppy disk systems can be obtained for as little as \$300, a hard disk system can cost \$1500 or more.

Now, just as drives were becoming standardized, Apple's Macintosh comes equipped with a Sony 3 1/2" drive. Hewlett-Packard chose the same Sony disk for its HP-150 business computer, and many other manufacturers have introduced 3" and 3 1/4" drives as well. Why the change? Won't the smaller disks hold less data than the 5 1/4"? Is there really any advantage to the new smaller drives?

Smaller Drives Stack Up Well

Surprisingly, the smaller drives have quite a few advantages over their 5 1/4" big brothers. First, the smaller physical size of the drive provides a more compact package, thus allowing the computer itself to be more compact (witness both the HP-150 and the Macintosh). Another big advantage of the new, smaller disks is that they are not floppy. Instead, they are encased in a light plastic housing, making them far less susceptible to the damage that often befalls floppy disks. The smaller size and sturdier packaging also provide a more transportable medium for programs and data. The disk fits easily in a shirt pocket, or in a regular envelope for mailing (hand cancel, please). In addition, its small sliding metal shutter protects the storage medium when it's not in use, so you don't have to worry about an ill-placed fingerprint destroying this month's sales records, (as you might with the exposed medium of the larger disks). With all this

cont. on pg. 25

Any Questions ?

The present global ignorance of computing may come, in part, from our natural aversion to asking simple questions—for fear of revealing only a shallow knowledge of vital topics.

Why not let someone else ask the questions while we sit back and benefit from the reply? That's the purpose of this column.

Q. What is an operating system?

A. An operating system is a program in the computer's memory that is responsible for controlling the basic functions of the system. A computer may use several kinds of operating systems, the most common of which is the Disk Operating System or DOS. It controls all interfaces with the disk drives, whether from programs or as user input. Another common operating system is known as the BIOS or Basic Input/Output Operating System. This one controls all I/O operations of the computer, including links to printers, modems, color graphics video circuitry, and other hardware.

Q. Why do some people bother with computer monitors when they can get the same picture on an ordinary television set?

A. The picture quality of a television set can't compare with that of a good monitor. This is, in part, because the TV must convert the video signals from Radio Frequency (RF) into video signals that represent the actual picture. With a monitor there is no need for a channel selector because it does not convert an RF signal. The signal supplied to the monitor is a direct video signal from the computer, with no messy frequency conversions necessary. Another performance advantage of the monitor is its ability to accept signals of a much broader bandwidth. In other words, the picture will have brighter and more definable

colors and there will be less color bleed from one screen pixel to the next. The monitor doesn't offer non-computer entertainment, but the improved video image is easier on the eyes.

Q. I'm trying to decide which storage system to use—tape or diskette. Is the price of a disk operating system justified?

A. As the price of disk operating systems continues to drop, the lowly cassette player seems less and less attractive. Now that disk drives for some home machines are approaching the \$200 mark, it is easy to justify that amount in time saved, not to mention tape costs. In order to be truly convenient, taped programs are best stored on individual cassettes, and that is a more expensive method than keeping multiple files on a diskette.

Q. Why buy more than one disk drive?

A. Most computer users can get by very well with one drive. However, there are many applications that require two drives, or operate much better with two. Many programs which handle data bases, such as word processors, or accounting software, need to have a program disk in one drive and the data disk in the other drive. Those programs that allow you to use one drive may have you swapping disks so often that you start wondering who's controlling whom. Dual drives are also very con-

venient for maintaining backup copies of an entire disk without having to copy the files individually.

Q. I have heard that the new remote keyboards used with the PCjr can only be used singly, not with several in one place, such as in a classroom. What is the problem, and what can be done about it?

A. When you place several keyboards in the same room, all using the infrared link to the main unit, you will probably run into an interference problem. This occurs when two people type on two different keyboards at the same time. The signals become mixed, and therefore unreadable at the computer. There are two solutions to this problem. If only one person were allowed to enter anything on a keyboard at any one time, then there would be no interference problem. But, there are definite logistical problems with this approach in a classroom. The second solution would be to use IBM's optional keyboard cable. The cable supplies a direct link to the main unit and turns the infrared transmitter off. The disadvantage here is that each keyboard will need a separate system unit. For group participation, the infrared keyboard will work quite nicely. It can be passed around from student to student as each one takes a try at the problems.

Q. Can I still get a disk drive for the TI-99/4A?

A. Several hardware makers are doing very well by continuing to support the two million or so 99/4A's now in use. Disk drives, 32K and 128K expansion cards, and other peripherals are described and reviewed in the pages of *Home Computer Magazine*.

Q. Would you recommend my buying a computer through a discount mail-order outfit?

A. If you are computing on a budget, you may find that the price variance between your neighborhood shop and a large mail-order house can mean the difference between owning the machine or going without. Mail order discount stores are usually reliable, in spite of the horror stories you may have heard about them. Remember, however, that your relationship with a discount house will usually last only as long as it takes them to cash your check and ship the box. You sacrifice the sort of dealer support you can get from a home-town shop—often crucial to a new computer owner. Then again, there are always users groups to help you learn to use the machine. In summary, there are good reasons for purchasing from either source. It just depends on your needs.

PREVIEW OF Summer's Consumer Electronics Show



Gazing into the crystal ball of last winter's Consumer Electronics Show reveals a clear vision of what to expect at this summer's product-introduction extravaganza.

Texas Instruments is on the sidelines. Commodore is changing course, IBM is gaining market share, and Apple is moving into the home. What's going to happen next? Will window technology become the predominant human/computer interface? Is entertainment software on the way out? Where is computer-aided instruction headed? Are computer prices going to come down even further?

Many of these questions will be answered at the Summer Consumer Electronics Show (CES) to be held in Chicago the first week in June. For now, by looking at the events of recent shows, we may be able to spot some trends and speculate on the future.

At the 1982 Summer CES, the home computer was beginning to be recognized as a desirable consumer product. Texas Instruments had paved the way with new people-friendly technology never before offered to consumers. And while TI had been concentrating on advanced work in the elec-

tronics lab, Atari, Commodore, and others had not been idle—they were busy planning intensive marketing campaigns to scoop up their share of the new market. The airwaves soon filled up with the celebrity-inspired sounds of the "new tech" advertising.

A year ago, CES was full of start-up third-party developers promoting their software for the various home computers. Manufacturers of both hardware and software began to ramp up production, and store shelves began to fill. In a battle for market share, prices



Competition is really heating up in the home education market. DesignWare has offerings in this area for Apple, Commodore, and IBM.

of the home machines were repeatedly slashed, rebates became the norm, and a full-scale price war catapulted the market into a state of confusion.

Then, on October 31, 1983, TI announced its withdrawal from the home computer market. One day later, IBM "unshelled" its PCjr (code-named "Peanut"). In the six months since then, we've seen Mattel and Timex pull the plug, Coleco run into quality control and shipment trouble, Commodore announce—then put on "indefinite hold"—a new line of machines, and Apple



The Learning Company was one of the first software companies to market programs for the IBM PCjr. Their popular education series is targeted to this new home user.

begin to posture in the home market while unveiling its long-awaited Macintosh.

Beginning at this summer's CES we can expect to see some interesting marriages between home computers and other high-tech devices such as laser disks. There should also be evidence in abundance that home computers will be used more as tools, not toys. The maturing software industry is hard at work developing home productivity packages for the most popular computers. In the past, home computer software development centered mainly around arcade gaming. Now



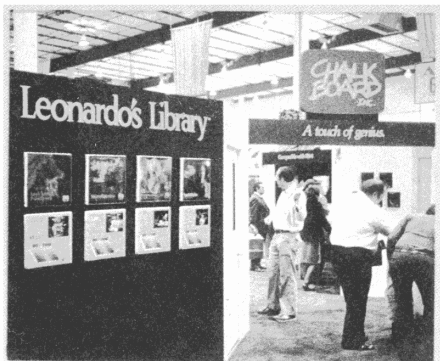
First Star Software, Inc., is one of the many new vendors now competing at the low end of the home market with several titles for Commodore and other machines.

the trend is towards entertaining educational programs and productivity tools.

The first productivity packages have, in fact, already arrived in the form of scaled-down office tools (word processors, spreadsheets, and the like). But the home environment demands its own set of productivity tools. Areas such as energy management, dietary and menu planning, physical conditioning, wardrobe coordination, and security await the creative genius of today's software developers. The Summer CES will shed light on new software that is more supportive of the home user's needs.

Industry watchers expect a continued explosion in Commodore add-on products and an abundance of new software for the IBM PCjr and the Apple Macintosh. There will also be more consumer-friendly software for the Apple IIe as a drop in price causes its user base to skyrocket.

New networking options will make these machines more attractive to schools and small businesses. Much of the latest productivity software really needs the speed and storage capacity of a "hard" disk drive (also called a Winchester) to be effective, but the



The world of home computer art is being enhanced by the light pens, mice, and touch pads offered by companies like Chalk Board, Inc. Adequate software support for new peripherals is crucial.

cost of putting one on each computer is too expensive. Networking with four or five computers that can share a printer and hard disk will provide an effective solution for small businesses and schools.

Prices on both computers and software should continue to drop during the remainder of 1984, though not as fast as during the recent price wars. Instead, look for more advanced products at prices close to those for earlier versions. We expect to see 128K-byte machines with a single disk drive start to become the *de facto* standard for the productivity home computer by year's end—with 64K-byte machines dominating the entertainment/educational niche.

Will all this come to pass? The answer lies in Chicago, where the Summer CES will set the stage for the final act of this year's home computer drama.

—**Digest Staff**



Entertainment software is certainly not dead, just more sophisticated and flashy. Adventure International has been producing challenging games for several years.

Software Trends

HOME-TRIAL OR PIRACY?

Software companies have resorted to paying for the consulting expertise of former pirates who help them devise ways to thwart program theft. Now that software rental companies threaten to cut into sales, the companies are more concerned than ever to develop un-copyable software. The software lease outfits argue that it makes sense for customers to rent software and try it out in its home setting before they buy it, and they'll give the customer a discount on the purchase price if the software works out. Outraged software companies counter that giving customers the opportunity to rent software doesn't create later sales. They say they're losing those sales altogether as the customers make their own copies of the software before they return it to the rental company.

FEMINIST NON-VIOLENCE

Elizabeth Stott and Lucy Ewell of Rhiannon believe personal and home computer software has always been designed and targeted with a male audience in mind. They're out to rectify the situation with a series of four adventure games designed expressly for girls. Addison-Wesley will publish the non-violent adventures—*Jenny of the Prairie*, *Chelsea of the South Sea Islands*, *Cave Girl Clair*, and *Lauren of the 25th Century*—for the Apple II, II+, and IIfx this spring. Each game will retail for \$39.95.

A MARRIAGE MADE IN JAPAN

TV and computing finally have more than a monitor in common. Sony Corporation has developed the technology for locally transmitted games and data—including still pictures—over cable TV lines. Cable companies in Japan will be the first hardware customers this summer. Not much is scheduled here yet, with most U.S. companies just in the "interested stage," but Broderbund has granted cable rights to their software to The Games Network of Orange County, CA.

SOFTWARE HARDELL

Software companies are adopting the aggressive marketing strategies that characterized the home computer hardware wars of last year. Sierra On-Line offers \$5.00 rebates on its educational programs and will give away a free game for every purchase of two; a coupon from their *Quest for Tires* nets the buyer a free "B.C." poster. Spinnaker will give away a free program for every purchase of four; and Parker Brothers offers a \$15.00 rebate for every purchase of two games. Epyx offers its "preview disks" of program excerpts at \$2.50, and K-TEL courts dealers with budget-priced software (\$10.99 for cassettes, \$12.99 for diskettes) for guaranteed sale or exchange and offers to freshen dealers' wares every 90 days.

DIVISION OF LABOR: THE GOOD, BAD, & UGLY

The costs of maintaining programming staff have convinced CBS Electronics and Sirius Software that they should focus on marketing and buy programming designs from outside firms. Others have decided the reverse: Imagic will focus on program development and leave the marketing to other firms, and Synergistic will stop publishing and concentrate on developing software. Such neat divisions of labor don't always work out, though, especially when one or both of the parties continue (or decide later) to both produce and market software. A case in point is the bitter feud between Software Arts, developers of *VisiCalc*, and VisiCorp, the firm that has marketed the program since 1979. Software Arts claims that VisiCorp is marketing VisiCalc much less energetically now that VisiCorp's own windowing integrated spreadsheet, *VisiOn*, is out. It's now up to the courts to measure marketing "energy levels."

Computers Enable



The day is coming when personal computers will be as important to handicapped people as their wheelchairs, hearing aids, and seeing eye dogs are now. Computer technology holds an exciting potential to allow handicapped people to participate freely in the mainstream of life. Unique applications of hardware and software can actually become the eyes, ears, voices, and hands of those who cannot use their own.

The concept may seem a bit strange to most home computer users, who depend on the conventional route of keying in programs, viewing monitor displays, and reading hard copy from a printer. How can a person with cerebral palsy who can't type, or a blind person who can't respond to screen prompts, use a computer? And what good is a personal computer to a quadraplegic, whose movement may be limited to nodding the head, raising the eyebrows, or even just breathing?

Handicapped users can take advantage of a computer's ability to receive and generate information in many forms. The computer doesn't really "read" the words we type in at the keyboard, or "talk" to us in the sentences we see on the screen. The Central Processing Unit works with electronic impulses: Input and output can be converted to whatever form is best for the user—whether it's

visual, aural, or tactile. A computer can serve as an electronic translator that compensates for the user's disability.

The Future is Here and Now

This kind of "miracle technology" is not years down the road—the dream product of obscure and unfunded research. Speech synthesizers, which are already used in everything from videogames to talking Coke machines, can make verbal communication possible for people with severe speech difficulties. The user just types in a sentence, and the speech synthesizer produces an understandable message. Speech capabilities are also used by blind writers and students, who can have the computer "read back" what has been typed at the keyboard, thus allowing instant error-checking.

In many cases, accessories that were developed for commercial appeal are perfect for disabled users. Touch tablets such as the Koala Pad are sold as graphics aids and as an alternative for children too young to handle a joystick. But these digitizing devices were a big breakthrough for people with cerebral palsy. Someone who doesn't have the motor control to write legibly, but who can scrawl signs with some kind of regularity, can use the Koala Pad along with a program that recognizes those signs and translates them into print.

Light pens, also marketed as an artistic novelty or a child's toy, can be held in the mouth or strapped to any motile part of a paralyzed person's body. They can be used to select menu options, draw on the screen, or even "type" commands on a simulated keyboard display.

Much of the new "enabling" technology was pioneered by disabled programmers who wanted to continue or begin a career in computer science. Programmers who lacked the manual dexterity to type in their programs were the innovators behind the development of special keyboard overlays, breath-controlled switches, and levers. The Optacon, a device that translates output from a monitor into braille, is used by blind programmers in specialized vocational training programs. Programs such as *PC Speak*, which lets a blind user scroll through the program while a speech synthesizer reads each screen aloud, were originally developed to make spreadsheet programs like *VisiCalc* more accessible. Developments of this type can open doors for disabled people in all walks of life.

Better For Everyone

What's merely convenient for the average home computer user can be truly liberating to the handicapped. For example, the Apple "mouse," now used with the Lisa and Macintosh models to make word processing and spreadsheet programs faster and more fun, can also be used as a screen pointer to make standard software accessible to people who can't type on the keyboard. Likewise, the IBM PCjr's programmable keyboard can also make multiple keypresses manageable for a one-handed typist, or for a paralyzed person who uses a mouth stick to punch in commands. And a program that dials the telephone may be just a novelty for most people, but can mean more independence for a mentally retarded person who chooses to live alone.

Other trends, such as electronic mail, at-home shopping, and computerized information sources will provide a new way of life for people unable to go out

or communicate by telephone. Communications networks and electronic bulletin boards are a boon to deaf people, who can work or socialize via the keyboard, instead of depending on teletype systems that can be cumbersome, and are usually owned only by other deaf people. The computerized systems will give them a standardized means to interface with a much broader segment of society.

Meeting the Challenge

Many new markets and industries have been opened up by this computer-hungry sector of the population. Some handicapped people have gone on to form small companies specializing in the development and marketing of hardware and software to meet the needs of disabled people. Others have initiated training programs to help disabled workers enter the job market. IBM and other corporations have turned to consulting firms for help in making their workplaces accessible to disabled employees, and computer skills are becoming increasingly important for rehabilitation counselors and trainers.

But many handicapped-rights advocates worry that progress is too slow and the equipment too expensive to benefit the people who need it. They are concerned that disabled people's needs will be bypassed in the rush to bring out profitable mass-market products. Dedicated companies that place need before profit and sell goods at cost do exist—but are not the norm. Disabled activists have organized to advise computer companies of their priorities, and to lobby for action. They have developed information networks and specialized publications to help people learn about and locate what they need.

So keep an eye on the desk next to yours. You may soon be working alongside a quadriplegic who uses a voice recognition module and microcomputer to thumb through files and write up a report, the same way you use yours to help keep your checkbook in balance.

—Joan Killough-Miller

New Tech News

A NEW MICRO-FLOPPY FROM JAPAN

The Apple Macintosh is making the Sony 3 1/2" floppy disk drive a standard in America, as the new micro-floppy gains in popularity. This same drive—although a fixed-speed version—has helped make the Hewlett-Packard 150 a very popular business computer. Some third-party developers have also come forward with 3 1/2" drives for other machines (e. g., the Apple II series and the IBM PC) Meanwhile, rumor has it that Mitsumi Electric in Japan has been perfecting a 2.8" drive which should prove to be very stiff competition for any of these products. The drive utilizes a single spiral track (as opposed to the standard concentric circle tracks) that allows it to access program and sequential files at incredibly fast speeds. It is said to load a 64K-byte program in about 8 seconds, but will be priced in the same range as an inexpensive cassette recorder. The new disk drive's medium is being developed by Hitachi, Ltd. (a subsidiary of Hitachi Maxell), and its reported \$2 price tag makes it a prime candidate for home computer applications.

NEW APPLE IIe

Apple is rumored to be testing an Apple II series compatible "transportable" computer. It is said to be based on a 65C02 microprocessor and to have 128K of RAM, one 5 1/4" single-sided, single-density disk drive, and a built-in keyboard in a 13" x 17" x 4" unit. (Note that a monitor is not included.) All existing Apple software would run on the machine, but while the new microprocessor is a step up from the old 6502—featuring two new addressing modes and 27 more op-codes—it can't boast the power of newer 16- and 32-bit processors. No release date has been set, and while the price tag is expected to be below \$1000, Apple so far will say only that it "does not comment on unannounced products."

WHAT WILL jr RUN?

Spinnaker, a leading third-party publisher of educational software, has once again distinguished itself by being the first publisher outside IBM to ship software for the PCjr. All three of the cartridges—*Facemaker* (\$34.95), *Fraction Fever* (\$34.95), and *Kindercomp*

(\$29.95)—come from their educational software "will-sell" list and are the result of months of careful translations. Along with Sierra On-Line's *HomeWord*, these Spinnaker offerings should keep PCjr users RUNNING until the second wave of PCjr software washes up on the retail beaches.

SINCLAIR PREPARES FOR QUANTUM LEAP

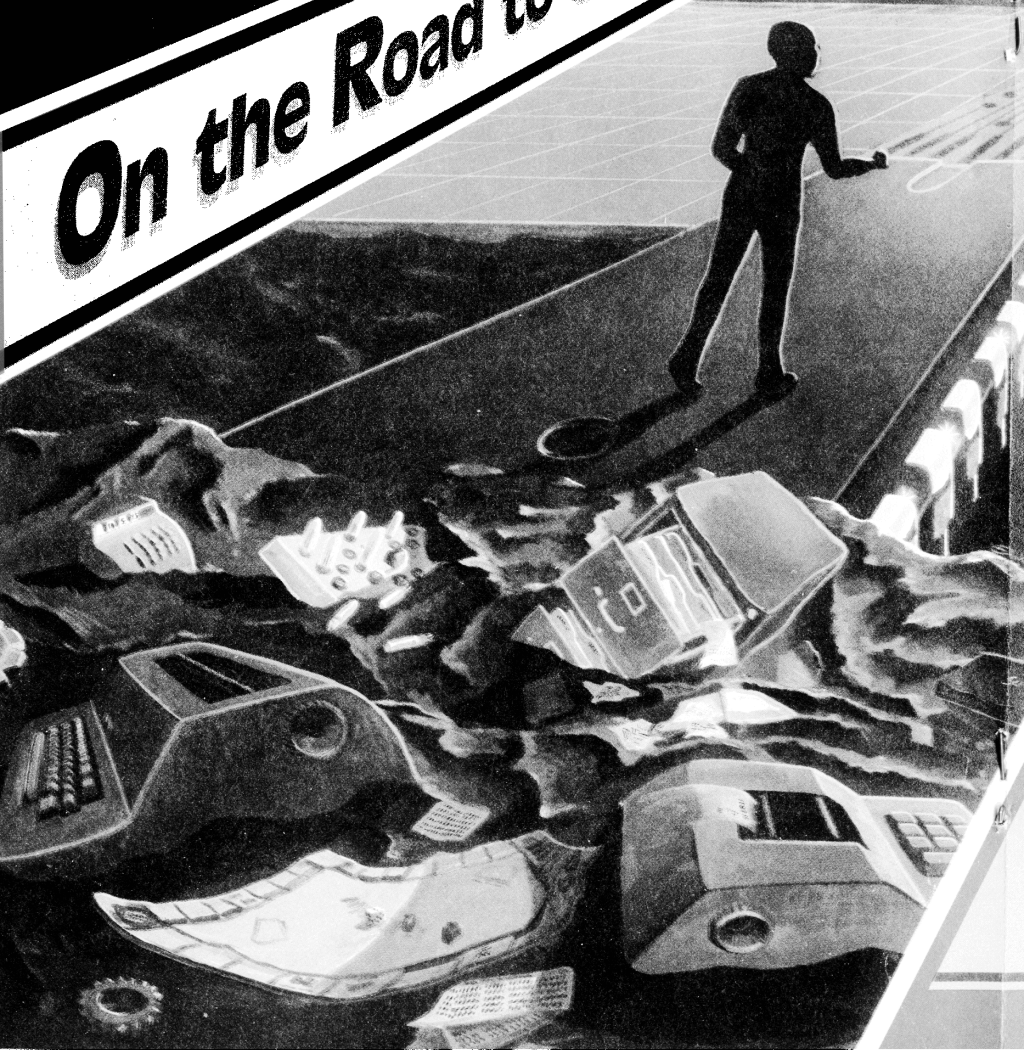
The company that brought us the first micro-micro for the home (the ZX-81) will soon be releasing the QL (for Quantum Leap) personal computer. Sinclair's 68008-based 128K RAM machine will include a dual continuous-tape-loop microdrive for up to 100K-bytes of data and sell for a mere \$499. A .5-megabyte RAM add-on will follow. The operating system will be called Q-DOS, and the native language will be SuperBASIC (an enhanced version of Sinclair's Spectrum BASIC). In addition, a London-based software house, Psion Ltd., is working on applications for the new machine that include the four most commonly used business packages: word-processing, spreadsheet, database management, and graphics. The exact release date hasn't been announced, but third-quarter mail order availability in the U.S. is expected.

AND NOW. . .jr COMPATIBILITY

While many continue to ask, "Is it PC-compatible?" Mindset of California has introduced a new home computer that may start people asking, "But, is it compatible with the PCjr?" A fully configured PCjr lists for \$1269. Mindset should be a faster and more powerful machine because it uses the 80186 (an upward-compatible relative of the the 8088 and 8086); it is PC-compatible at less than \$1700. The System Unit, featuring a detachable 84-key low-profile keyboard, 2 cartridge slots, a custom video processor, Microsoft's GW Basic—but without a disk drive—carries a suggested retail price of \$1099. Rumor has it that Mindset developers have plans for an adapter for the cartridge slots that will give Mindset access to PCjr's cartridge-based software. Looks like this new start-up firm has its mind set on giving Big Blue a run for the up-scale home computer market.

“Mathematical functions act like recipes for your computer. Your input is the raw ingredients, the computer cooks them according to the recipes, and the output is the finished meal.”

On the Road to Computer Literacy



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COMPUTERS: MAGICAL MATH MACHINES

MAPPING & FUNCTIONS

Part 2



Have you ever wondered how computers can monitor a nation's missile defense system, generate a company's payroll, and provide medical diagnoses?

Or how they can print out your Christmas card list, control your microwave oven, and play games with your four-year-old?

It's all done with numbers—simple mathematics. The key to how these complex machines work is as basic as on or off, positive or negative, one plus one.

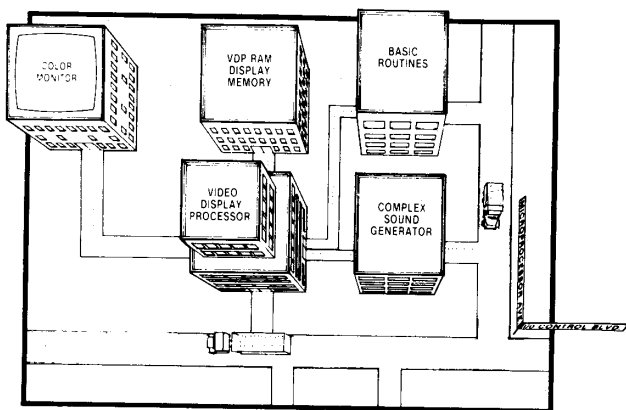
Understanding how a computing machine "thinks" involves understanding elementary mathematics. All computers use simple mathematics to transform a set of instructions into action. These sets of instructions—programs—organize and transmit data, solve problems, play games, and—through interfacing with other types of machines—even perform physical labor.

One of the most important mathematical ideas that all computers use is **mapping**. Computers use maps in much the same way we do. A city map isn't identical to the city itself—it's just a piece of paper after all—but once you understand what its symbols represent, it becomes a tool to help you find your way around. The map is useful because there is a one-to-one correspondence between the symbols on it and the actual places they represent. If you see the symbol for a mountain on a map and the symbols for the roads leading to the mountain, you can follow the actual roads and find the real mountain.

Mapping in mathematics is very similar—one set of symbols is said to "map" a group of numbers or other symbols onto another group. It's a lot like writing a report. You have a group of thoughts to convey that you map onto a piece of paper in the form of notes or an outline. Because you do the mapping yourself, you know what thoughts the notes stand for. Later, you can map those notes into readable sentences and paragraphs so that your original thoughts are conveyed to your reader. We have rules of grammar and syntax that allow you to map the sentences and paragraphs back into your thoughts, so that in a sense you have "mapped" your thoughts onto those of your reader.

Mapping With Mathematics

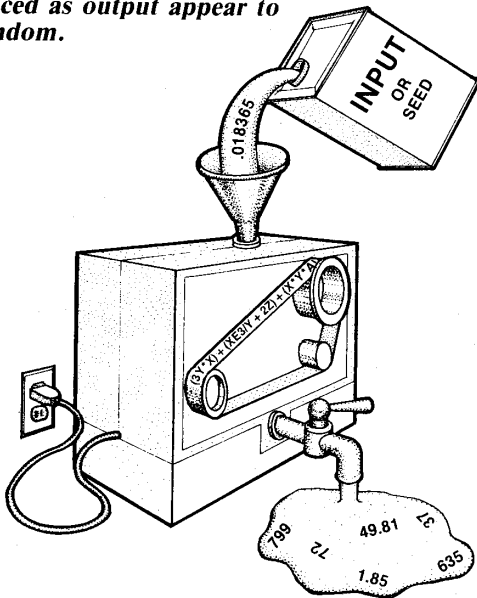
Mathematics has a variety of rules for mapping. One major type of mathematical mapping is called a **function**. A function maps one set of things onto another in a unique way. You can think of these function maps as working like a recipe for baking a loaf of bread. The recipe calls for specific quantities of ingredients—say, 4 cups of flour, 2 table-



Computers use maps in much the same way we do. The map of a city isn't identical to the city itself—but once you understand what its symbols represent, it becomes a tool to help you find your way around. The map is useful because there is a one-to-one correspondence between the symbols on it and the actual places they represent.

spoons of honey, 1 package of yeast, 2 teaspoons of salt, 2 cups of milk, etc. The recipe also includes instructions for combining the ingredients to make the bread. If you combine them according to these instructions, you will get the same amount of bread every time. In fact, if you follow the instructions precisely, then you will get an identical loaf of bread every time (given identical ovens, relative humidities, temperatures, etc.).

A typical program takes advantage of a specialized function called a "random number generator." The function in your program accesses this and tells the computer to respond with a unique output. It does this by entering a number into a complex mathematical function. The series of numbers produced as output appear to be random.



Mathematical functions act like recipes for your computer. Your input is the raw ingredients, the computer cooks them according to the recipes, and the output is the finished meal. For a given set of numbers a mathematical function returns a **unique** answer. Because mathematical functions work like this, we know that when you use a specific function it will return its own unique answer every time and that any other answer is wrong.

The idea of a unique output (the bread or the answer, depending on what you put in) does not mean that the only way to get a different output is to use different inputs. Some functions give the same answer for several different sets of input. For example, the function $y = 0 * x$ always has the same answer because any real number x multiplied by zero equals zero. There is, however, one critical test of a function: For any given input, a unique output results.

To understand functions better, let's look at how they are used in our lives. Income tax (a subject near and dear to our hearts) is a good example of how functions affect us all. The amount of tax you pay, the number of people you support, and your tax-deductible expenses are all functions of your income. If, for

a given income and set of conditions two people paid drastically different taxes, it would cause a lot of problems. Needless to say, the functions are so complex that it might seem they do pay drastically different amounts, but generally the mathematical functions used see to it that for a given income and deduction schedule a unique amount of tax is paid.

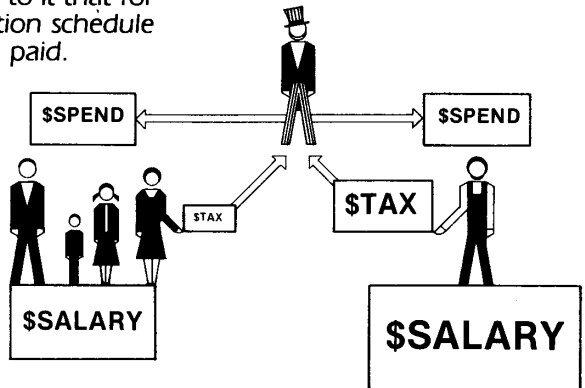
A Function Machine

The reason we've spent so much time explaining mapping and functions is that computers are primarily function machines, and their programs are the functions that they implement. When you tell a computer in BASIC to PRINT "HELLO" you know that it will put the word HELLO on the screen. That's because it understands that the BASIC function PRINT means to put on the screen the word or words that are contained within the quotes. Every time you tell it to PRINT it will do so, because the function PRINT has certain rules that make it always give a unique output for a given input.

When you write a program on a computer, it's like writing a whole series of connected mathematical functions that will give a unique output for a given input. When your program RUNS it will always give the identical output for identical input. The output will always be uniquely connected to the input by the functions that the computer implements in the program.

What about game programs? They change every time played (if they're any good), even if the same options are selected. Though this seems contradictory, there is a mathematical answer. Games employ a specialized function called a **random number generator**.

A function in your program accesses this specialized random number generator and tells the computer to respond with



The amount of tax you pay is a function of the number of people you support and salary. Mathematical functions used by the government see to it that for a given income and deduction schedule a unique amount of tax is paid. Some functions yield the same output (spendable income) for different sets of input (salary and deductions).

a unique output. A number called the **seed** of the random number generator is entered into a complex mathematical function, and a series of numbers is produced that seems quite random. The program then instructs the computer to make decisions based upon these seemingly random numbers, which, in turn, make the game operate differently every time.

In most game programs, if you could seed the computer's random number generator in the same way every time, you would always get the same game. Luckily, computer programmers see to it that a random seed is entered into the random number generator each time the program runs. This makes

the game respond with a unique output each time. So you see, functions can even be made to appear to be non-functions if you know how to use them.

Now that you know computers are based on functions, you see how they can be so useful. If you want your computer to solve math problems for you, it's obvious that its mathematical functions will figure them out correctly every time—if you program the functions correctly. If you program them so the functions don't adhere to the rules of the problems, you will get a lot of wrong answers—though you can rest assured you will get the same wrong answer for the same problem every time because the computer will be consistent in giving you unique output for your input.

These function machines (computers) can also be interfaced to data storage devices that will keep track of vast quantities of data for you. They can be programmed to use functions to check for system errors. A computer's functions can even be made complex enough to control entire manufacturing processes—all because every given input will always produce a unique output.

“... functions can even be made to appear to be non-functions if you know how to use them.”

Industry Watch

COURSE CHANGE AT COMMODORE

Recent turnovers in the management at Commodore have kindled much speculation about the company's future. When Commodore's founder and president, Jack Tramiel resigned in January, four other top executives soon followed suit. Shortly afterward, the company announced that it would delay production of its new 264 and 364 computers. This decision may stem partly from management upheaval and partly from the critics' reaction to the new machines at the Winter Consumer Electronics Show. Many observers felt that the machine was not a significant improvement over the C-64. And the fact that it also wasn't directly software-compatible with the C-64 didn't help matters any. Clearly, Commodore is going through some growing pains, making many C-64 owners uneasy about continued support of their favorite machine. But it is unlikely that Commodore will soon scuttle its most popular product. The Commodore 64 is selling extremely well right now, and provides a healthy cash flow for a company in transition.

VIDEOTECH COMES CLOSER TO REALITY

Home computer-based shopping, entertainment, banking, and other kinds of information retrieval—videotex—has been in the formative stages for years, but only now does it seem ready to take off. Three huge backers—CBS, IBM, and Sears—have undertaken a joint venture intended to tap computer households. Other companies have attempted similar ventures, but none has had the combined clout that is possible with a conglomerate such as this. The companies predict that they will need several years to put their videotex plan into full operation, but that it could become a 30 billion-dollar industry within a decade. The road to riches won't be easy, however, because sales of that magnitude require at least half the homes in America to have a home computer. The "Big 3" expect that the availability of videotex services will be a strong enough incentive for consumers to buy a computer—thus making their sales forecast a self-fulfilling prophesy.

DATA DEWAR'S DELIGHT IN DOING

The Dewar's Profile of Computer Professionals is based on interviews with over 300 men and women in this field. According to the survey, job satisfaction is extremely high: over 90% would not leave the field. Over 80% would not even change to another area in data processing. It may come as a surprise that this "technical" industry has a high regard for language skills. Creative liberal arts graduates can do well in many areas of this business. The chief complaint heard among computer professionals is that there is still too much paper work. Although some observers predicted that computers would help eliminate this burden, it is still the bane of many people employed in the computer field.

TECHNO-WAR WITH JAPAN

Food for threat: First we nearly reached Sputnik-level hysteria over Japan's progress towards developing a super-powerful computer. Then we shuddered at reports of super-cheap, powerful micros soon to cross the Pacific to devastate the machines we know and love. The latest scare is seen as a Japanese infringement on software produced and copyrighted by U.S. firms. Japan's Ministry of International Trade and Industry proposes to enhance software development in that country by forcing foreign companies to license software to Japanese firms if such is in the national interest. American software companies see Japan's proposal as nothing more than piracy, and they are protesting it via the U.S. embassy in Tokyo. On another front, Japanese developers of machine tools for manufacturing integrated circuits are making great strides to capture the world market. In a market whose sales could approach six-billion dollars this year, the Japanese could easily slice off a third of the pie—more than doubling their share from last year. U.S. producers of such equipment are countering the Japanese attack with unprecedented expenditures for research and development.

Celebrity Software and Software Celebrities



Celebrities have long been involved in the promotion of computers and software. One has only to think of Bill Cosby, Alan Alda, and Charlie Chaplin on TV, of Leonard Nimoy and even Minnesota Fats at recent computer shows. But the luster of celebrity will shine from within soon, as software companies marry expertise and famous names and scenarios with computer programming. There's even a movement afoot to create software's own heroes and celebrities.

While Japan diligently perfects the technology for expert, knowledge-based systems, software companies in the U.S. have blithely embarked on "expert-based" software production. The new software comes from the collaboration of famous and near-famous experts in their fields with software programmers. James Fixx, author of *The Complete Book of Running*, has contributed fitness lore and his name to MECA's *The Running Program*. Investment advisor and best-selling author Andrew Tobias has developed *Managing Your Money* with MECA's programmers.

We're not sure how extensive his actual contribution will be, but Mr. Rogers will at any rate lend his prestige to CBS Software's preschooler software, and Sesame Street's Big Bird, Cookie

Monster, and Ernie will star in Atari's educational games aimed at the 3 to 7 years set and promoted by the ubiquitous Alan Alda. Other famous names and characters are coming on-line: the late Bruce Lee's name has launched Datasoft's new martial arts adventure game; Marvel Comics' Super Heroes(tm) will appear in software from both First Star and Adventure International; and Walt Disney characters will star in software from Atari.

Famous fiction writers will lend their illustrious names and scenarios to computer games too. Simon & Schuster has prevailed upon the likes of *Galaxy* editor and seven-times Hugo Award nominee James Baen to prevail upon the likes of John Chenault (*Snake!*) and Stephen Walton (*Starclash II*) for scenarios. And next season the Baen series will release Robert Heinlein's *Glory Road*, Stephen R. Donaldson's *Animal Love*, Poul Anderson's *The Game of Empire*, and Larry Niven's and Jerry Pournelle's *Inferno*. Simon & Schuster will also turn Douglas Adams' *The Hitch-hiker's Guide to the Galaxy* into an adventure game series. Epyx will release *Robots of Dawn*, based on the book by Isaac Asimov. Miyamoto Mushashi's 300-years-old *A Book of Rings*, recently a best-seller among businessmen who find

parallels between their concerns and those of a samurai warrior, will go on from that unlikely success to become an adventure game. Authors' contracts will have to include software rights as well as paperback and movie rights from now on.

Let it run out of celebrities from other media, software has also begun to turn out its own notables. Scott Adams has been something of a cult hero among fans of his adventure games. Now his software company, Adventure International, will release the first of its series of adventure games featuring Marvel Comics Super Heroes as a Limited Edition Scott Adams Signature Series. Along with Adams, First Star Software's Head of Design and Engineering, Fernando Herrera, is among the first true software celebrities. His games have won awards, and he has been honored by both the Toronto Film Festival and

UCLA's Video Game Conference. Herrera was the first software author to conduct an autograph signing, but he's not likely to be the last. This spring Simon & Schuster will launch their software writers on "author's tours." Their first candidate for the star system treatment is Sat Tara Singh Khalsa, a programming Sikh whose *Typing Tutor I* and *Typing Tutor II* for Kriya Systems are already best-sellers. Simon & Schuster will send Khalsa on a media blitz this spring to publicize *Typing Tutor III*(tm). In time-honored author's fashion he'll appear under Simon & Schuster's auspices on radio and TV talk shows, at press interviews, and at autograph signings in eleven major cities. And to think that only a year or so ago programmers were fixed in the public mind as those pasty-faced white-socked fellows happily programming in obscurity!

—*Erin O'Connor*

Why . . . cont. from pg. 5

added convenience and indestructible packaging, the disks sell for approximately the same price as premium-grade 5 1/4" diskettes.

In comparing the amount of data storage available on these smaller disks, Sony says its disks have 437.5K-bytes maximum capacity, which is more than a double-sided, double-density 5 1/4" disk on the IBM PC. Technological advances have made denser storage possible (i.e., more tracks per inch), due in part to the more rigid packaging and the increased stability of the way the disk is held in the drive.

The 3 1/2" disk drive on the Hewlett-Packard 150 uses a format such that the disks hold 270K-bytes. Meanwhile, the Macintosh puts 400K on each disk by utilizing a variable-speed motor in the drive.

You may be wondering why these advances have not been applied to 5 1/4" disks. Well, now they have. Kodak has just released a 5 1/4" disk drive that will allow a special disk to hold nearly 10 times the normal amount of data (3.3 megabytes). However, interfaces are not yet available for major computers (See *Home Computer Digest* 1.1 for details on this drive).

Even with all the advantages that the smaller disks have, a great furor has arisen over which of the small disks (3", 3 1/4", or 3 1/2") will be the "standard" micro-floppy in the industry. Many people say the Sony 3 1/2" has already become the de facto standard, but considering the lack of any standard format (Sony, H-P, and Apple all use different ones), one of the other disks may yet gain supremacy in the fight to become the standard disk. In April, the American National Standards Institute (ANSI) will vote on a resolution declaring one of these different micro-floppies as the *industry* standard, but it's our guess that the *marketplace* will determine the *true* standard.

—*Roger Wood*

Magazine scanned
2022 by Stephen Shaw

Computers in Education

PLATO GETS NEA SEAL OF APPROVAL

Control Data Corporation's PLATO courseware—available on the Apple, IBM, and Texas Instruments home computers—has earned the coveted approval of The National Education Association. Evaluations conducted by teachers and programmers found PLATO's Math, Foreign Language, and Computer Literacy packages (16 specific titles in all) technically reliable, educationally sound, and easy to use for both teachers and students. The NEA's nearly two million members have yet to react to the news, but CDC is busy converting more titles to run on the Apple and IBM.

UNIVERSITIES HAVING MAC ATTACK

Twenty-four American universities have joined the Apple University Consortium (AUC) to get the \$2500 Macintosh at a large discount. While retailers worry about how such discounts will affect their hardware profits, Apple is reportedly counting on \$60 million in commitments from consortium members over a 3-year period. In return for their discounts, the universities are each expected to purchase \$2 million in Apple products as well as develop curriculum, new applications, and educational software for the Mac. IBM will undoubtedly keep a close eye on what happens because some AUC members also have similar contracts with Big Blue. The winner in this battle for dominance in academia's hallowed halls may not be IBM, Apple, or commercial software producers. With educational software coming out of prestigious universities, the consumer will emerge the real victor.

A VIDEO GAME A DAY...

The new Basic Books publication *Mind At Play: The Psychology of Video Games* offers arcade fans new justification for the time spent in pursuit of the supreme score. Authors Geoffrey R. Loftus and Elizabeth F. Loftus applied the results of psychological experiments to video games—"electronic Skinner Boxes"—and found that they have a positive effect on memory retention. The same elements that keep you depositing coins also condition your mind to expect the unexpected, to remember details, and to respond quickly to each encounter. The book presents evidence that video games are fun, educational, have military training potential, and can even be substitute friends! Where else can you get all that for a quarter these days?

SCHOOL DAYS ON 25 DISKS OR LESS?

Kaypro, looking for ways to court the home computer market, may be eyeing the schools. At Winter CES, David Kay, Kaypro's vice-president of marketing and sales, implied that their next move could be a combination of putting large quantities of educational courseware on diskette and creating a low-cost, disk-equipped computer to lure educators and then parents to the Kaypro product line.

COMPUTERS: PRESCHOOL TOOL OR TRAUMA?

Are preschools with computers preschools with a plus, or is teaching technology to tots merely accelerated alienation? Experts feel that adult involvement makes all the difference. Certain child-development specialists have warned against long periods of passive, non-interactive computer use that utilizes the machine as no more than an electronic baby-sitter. On the other hand, if a responsible adult uses the computer with the child, the experience can increase his self-esteem, improve his social interaction, and sharpen his cognitive and motor skills.

SECRETARY BELL RINGS EDUCATORS' CHIMES

Hot on the heels of a Presidential directive to bring computers into every student's studies comes a message from Education Secretary Terrell Bell offering federal funds to educators and school systems to develop educational software. Bell plans to give software development a "very high priority" in hopes that quality software, generated by those who need it, will encourage in-school use of computers, and will be available to the public at low prices. This news is causing concern in commercial software houses who may claim that this is government's attempt to control the software market as well as what children learn in the classroom. Secretary Bell asserts that this funding program will benefit students, which should be the main concern of all educational software developers.

Novel Applications

AND NOW THE GOOD NEWS

The Good Book is now available on diskette for Apple users, and versions are in the works for IBM and CP/M users. Bible Research Systems of Austin, Texas, offers THE WORD processor, which contains the entire King James Version of *The Bible*. The software has built-in programs to analyze, display, cross-reference, annotate, and print Biblical text. The program will be a great boon for theologians, but somehow we don't think an END OF FILE message will ever replace "Here endeth the reading."

HIGH-TECH DECO

And now another reason to own a home computer: It can be your personal interior decorator. *Home Decorator*(tm), from SOFTRON, Inc., will take you in hand with expert advice on color, furniture, and room layout. With just a few keypresses you can install carpeting, paint walls, and rearrange the furniture to your heart's content. And there's no one to throw a fit if you want to try the baby grand in the far corner just one more time...

ON DISK AND READY-TO-WEAR

Looking for a lawn mower, a cruise to Curacao, or the latest new wave album for your nephew's Bar Mitzvah gift? Your computer may be able to show you just the thing, without the hassle of crowded malls or tedious walks through the yellow pages. CompuServe is pioneering an "Adformation" service that lets you shop at home through on-line catalogs of merchandise and services. More advanced than earlier "electronic shopping" schemes that listed only simple product descriptions, Adformation will contain a detailed data base on products in ten categories: books, magazines, credit card subscriptions, club memberships, gardening and lawn care, national newspapers, records and tapes, financial services, computer products, and travel/vacation. On-screen instructions will guide the shopper in making the purchase directly from the manufacturer or through a retail outlet.

THE COMPUTER THAT CLIMBED MT. EVEREST

Their tents are packed, the gorp is bagged, and the yaks are ready and waiting to go. This spring 16 American mountaineers and 15 Tibetan porters will attempt to retrace the "classic route" to the summit of Mt. Everest, following in the very footsteps of George Leigh-Malloy, the legendary British climber who wanted to climb Mt. Everest "because it's there." Stowed in the old kit bag, (among the seven tons of equipment the group will be hauling) will be an Okidata dot matrix printer hooked up to a Columbia VP portable computer. The system will facilitate biomedical research and financial accounting, functioning within a portable research tent, which will be heated to protect the hardware against the - 30 degree chill.

The computer will coordinate the difficult logistics of the trip and insure that gear is unloaded in the proper order at each campsite. It will maintain a budget, monitor food consumption of both humans and yaks, and chart medical information such as pulse rates to warn against the danger of overexertion.

Dubbed *Ultima Thule* (a Greek and Latin phrase meaning "the outer limits of achievement"), the expedition is a far cry from the days when backpackers took the tags off their teabags to cut down on the weight of their packs.

WANNA MAKE A BET?

Hi there, sports fans. Are you tired of taking a beating in the office football pool? *Pro Sports Stats* is a software package from Eastern Computer Consultants that lets you play Monday morning quarterback before the weekend rolls around. The program gives you complete statistical records on professional football teams from 1970 to the present. Its data base includes win/loss records, point spread information, coaching history, records of playing surfaces, and other critical statistics. Using the operating program, you can plug the relevant information into your Apple, IBM PC, or Commodore 64 (plus several other popular models), consult your team's history, and pick a winner.

Gameware Updates

VIDEO GAMES SPIN OFF THE BIG SCREEN

The movie release of *Dune*, Frank Herbert's science fiction classic, is expected to catch the fancy of many home computer users. This anticipation led a number of toy and video game manufacturers to vie for pre-release licensing agreements with Universal Pictures. Parker Brothers was the big winner in this contest and has been awarded the arcade and video game rights for the film, which is scheduled to be released sometime this year.

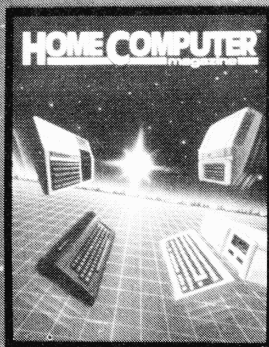
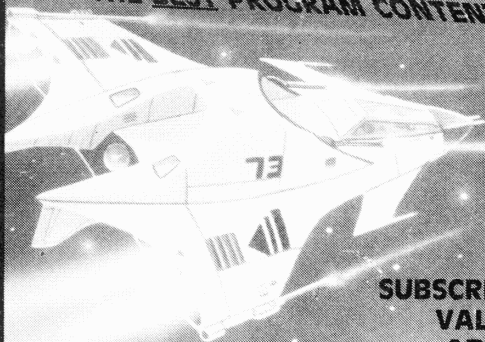
SAILING SOFTWARE COMING ABOUT!

Landlubbers and sailors alike can enjoy the excitement of an afternoon on the water with *Regatta*, a new sailing game by Howard W. Sams & Co. *Regatta*, for the Apple II, simulates sailing races on four different lakes while a clock on the screen shows elapsed race time. Penalties are recorded each time a boat hits a buoy or runs aground. The game comes complete with an illustrated instruction manual that defines some basic sailing jargon such as running, reaching, tacking and "yarning."

GO FOR THE GOLD—IN YOUR LIVINGROOM

Armchair athletes should be warming up the television sets and getting their sweatsuits out of mothballs in preparation for the summer Olympic Games. For those who want to start the action early, a variety of home computer and video arcade games is now available. *HES Games 84*, by Human Engineered Software, and *Summer Games*, by Epyx, have been added to the growing list that started with *Olympic Decathlon* from Microsoft. *HES Games 84* recreates a variety of summer games events including archery, springboard high diving, and weightlifting. *Summer Games* is actually a series of different games modeled after Olympic events. *Track and Field*, a surprisingly realistic arcade game that requires the player to use split second accuracy combined with a special touch on the keyboard, is expected to be adapted for the home computer in the near future.

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