Approved January 18, 1983
Date

MINUTES OF THE House COMMITTEE ON Communication, Computers and Technology.

The meeting was called to order by Representative Mike Meacham at
Chairperson

3:30 ~~a.m.~~/p.m. on January 11, 1983 in room 531-N of the Capitol.

All members were present except:

Committee staff present:
Marlin L. Rein, Chief Legislative Fiscal Analyst, Committee Staff Director
Sherry Brown, Fiscal Staff, Research Department
Chris Stanfield, Fiscal Staff, Research Department
Arden K. Ensley, Revisor of Statutes
Betty Ellison, Secretary to the Committee

Conferees appearing before the committee:

(No Conferees)

Chairman Meacham began the meeting by asking members to introduce themselves and he then introduced the staff.

The chairman discussed some topics to be covered by the committee, beginning with the Division of Information Systems and Computing (DISC).

The committee will also pursue an inventory and legislative oversight at the Regents' institutions.

An important area for the committee to cover in addition to the computers is Telecommunications. Copies of a plan by the Office of Telecommunications in the Department of Administration will be made available later in the session.

Chairman Meacham stressed that the committee will be required to do a significant amount of reading as it is the mission of this committee to develop a working knowledge of these issues that the legislature will be facing in the future.

Another area to be pursued is television, separating the system into two areas - public television as either part of the telecommunications plan or a separate issue. Public television service to unserved areas in Kansas will be discussed.

The committee will look into the educational institutions in Kansas, a couple of Regents' institutions as well as a number of community colleges which are using cable television.

The chairman observed that a whole ream of material is starting to develop now in the area of high-tech development. Biomedical engineering is of interest to the committee.

There may be a number of field trips to such places as KANS-AN office and Division of Information Systems and Computing in the Department of Administration. Visits may be made to Kansas University or Kansas State University to look into their computer systems.

Chairman Meacham again emphasized the importance of reading, since the primary task of the committee will be education. He said that the work done this year is preparatory to the decisions that the committee will make in future years.

Materials for study were distributed by staff. (Attachments 1 and 2)

The meeting was adjourned at 4:00 p.m. by the Chairman.

The next meeting of the committee will be held at 3:30 p.m. on January 12, 1983.

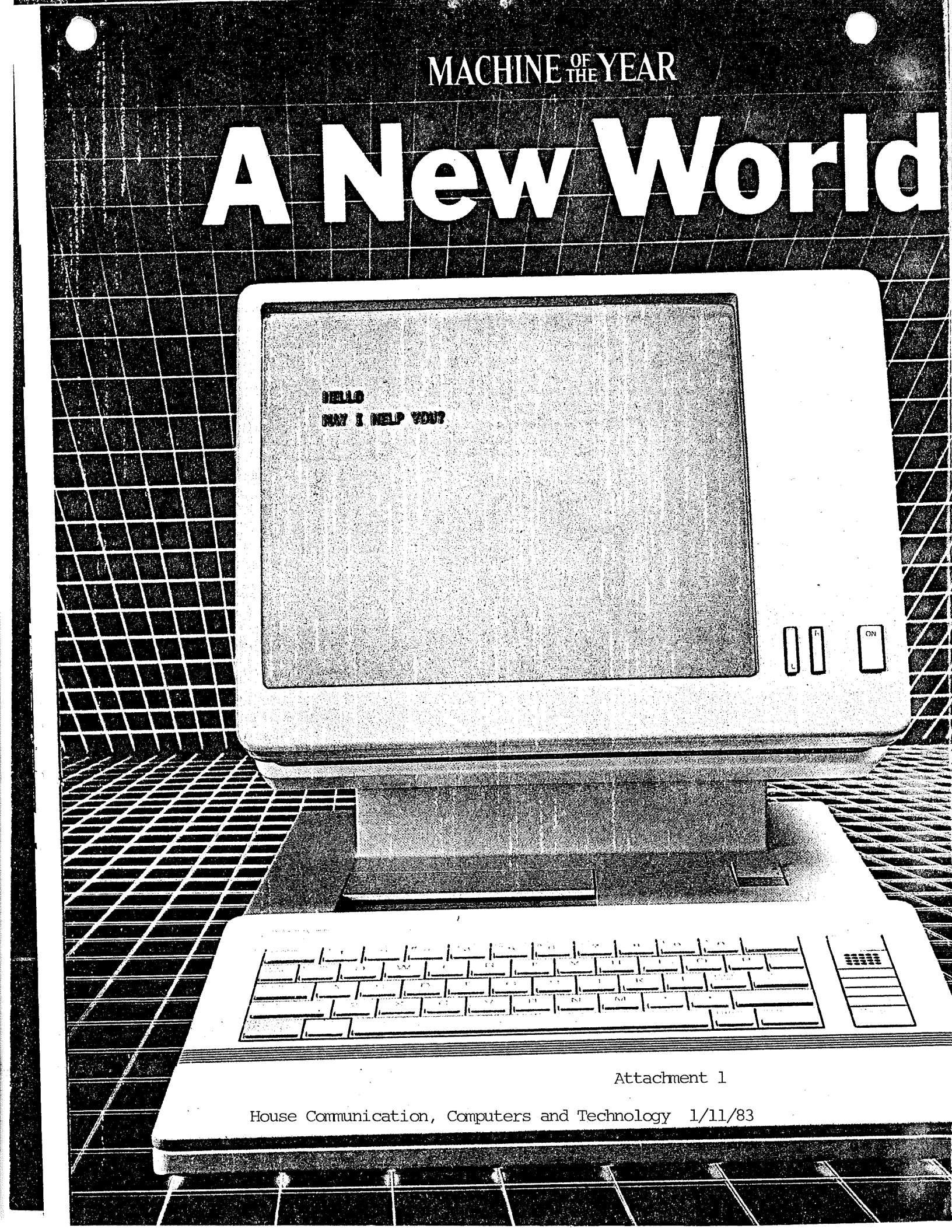
Date: 1-11-83

GUEST REGISTER

HOUSE

COMMITTEE ON COMMUNICATION, COMPUTERS AND TECHNOLOGY

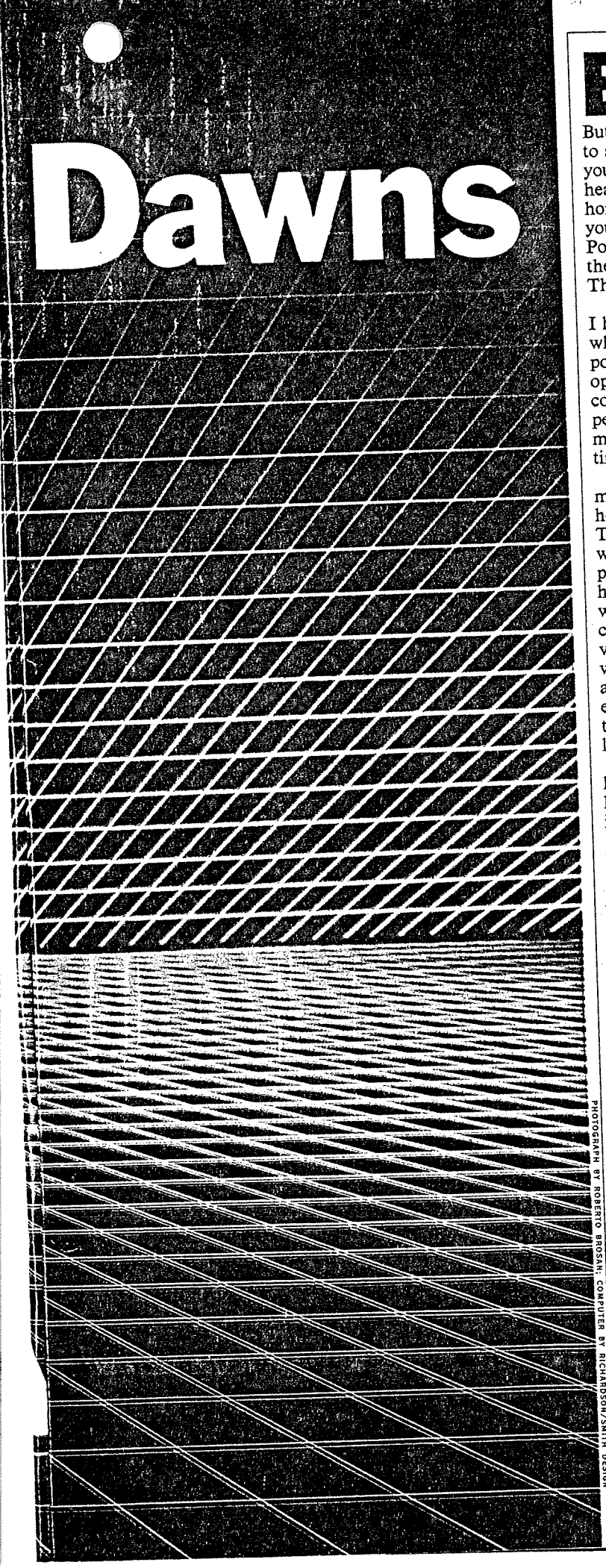
NAME	ORGANIZATION	ADDRESS
Harriet J. Lange	Kans. Assn. of Broadcasters	724 Ks. Ave, Topeka
Ed Schaub	Southwestern Bell Tel. Co.	Topeka Kansas
Norman Umhoty	KS. Credit Union League	Topeka
Barb Reinert	Ks. Women's Political Caucus	Topeka



Attachment 1

House Communication, Computers and Technology 1/11/83

Dawns



PHOTOGRAPH BY ROBERTO BROSAN; COMPUTER BY RICHARDSON/SMITH DESIGN

Ever see one of these before, mister? Yes, you. I'm talking to you, ma'am. Ever work one of these Commodores or Timex Sinclairs or Osborne 1s or TRS-80 IIIs? How do you like them Apples? Just a joke, son. Good, clean fun. But you look so skeptical, like you're from Missouri, and I want to sell you one of these beauties, 'cause you need it and 'cause you want it, no matter what you say. Deep in your all-American heart (you *are* American, aren't you, pal?), you crave this little honey, which will count for you and store for you and talk for you, and one day it might even kiss for you (no offense, miss). Point is, it will save you time. Time time time. And we need all the time we can save. Can't kill time without injuring eternity. Thoreau said that. Great American, Thoreau.

You say: Why should I want to save time? I hear you, friend. I hear you. You wonder where it gets you, saving all that time, when you think about old Henry Ford's gizmo that was supposed to save a peck of time. Only instead of conquering the open road, we wound up living on it. You've got a point. You a college boy? But this is the country of the A-bomb and the zipper. We always save time, good and bad. *Tempus fugit.* Time is money. Most of all, time is dreams. And computers give you time for dreams.

This sweetheart here, this little baby, looks like any ordinary machine, isn't that so? A mess of screws and buttons, a whole heap of plastic. Comes with new words too: RAMS and ROMS. Think that's what the machine is made of, do you—the hardware and the software and the mouse? Not a chance. The computer is made of *you,* lady. It's got you all inside it. You wished it here. No, not to do your taxes or to teach you German or to whip you in Pac-Man four out of five. You wished it here because the country was running low on dream time. Which provides *equal time.* I'm talking social equality. I'm talking freedom with a capital F, like when the railroad first rolled in 150 years ago, roaring and puffing over the countryside, scaring the chickens and the cows, but offering everyone a ride all the same, that's everyone, I say, giving the Republic to the people. Just like the computer.

Now I'll tell you something about machines in American history. No, don't walk away; won't take half a minute. We may have turned into what looks like a nation of doohickeys, but that isn't what we had in mind at the start. What our forefathers (bless 'em) wanted was the land, not machines, the great, wide, beautiful land that was thought to go on forever. When the machines came clanging along, they were supposed to let folks enjoy the land more, the green grass and the blue water. Only they got out of hand, you see, until all the lovely forever greens and blues got squeezed in a corner full of national parks and the sky choked black with factories. That isn't what we intended, though. Machines were meant to open the territory, not close it down.

What's all this got to do with computers? you ask. I'll tell you. They reopen the territory, that's what they do. Oh, not the land, of course. That's gone like the topsoil, with the wind. But the land was never our real territory anyway. It was the dream, my friends; the territory was always the New World ideal. We don't ever want to run out of that, do we? Goodbye land. Hello space. Can't you picture all those moons and stars, smiling and winking and waiting for a visit? Howdy, Mr. Jupiter. Inventions arise when they're needed. This here screen and keyboard might have come along any old decade, but it happened to pop up when it did, right now, at this point in time, like the politicians call it, because we were getting hungry to be ourselves again. That's what I think, buddy. "The most idealist nations invent most machines." D.H. Lawrence said that. Great American, D.H.

O pioneer. Folks over in Europe have spent an awful lot of time, more than 200 years if you're counting, getting up on their high Lipizzaners and calling us a nation of gears and wheels. But we know better. What do you say? Are you ready to join your fellow countrymen (4 million Americans can't be wrong) and take home some bytes of free time, time to sit back after all the word processing and inventorying and dream the dear old dream? Stand with me here. The sun rises in the West. Play it, Mr. Dvořák. There's a New World coming again, looming on the desktop. Oh, say, can you see it? Major credit cards accepted.

—By Roger Rosenblatt

TIME/JANUARY 3, 1983

The Computer Moves In

By the millions, it is beeping its way into offices, schools and homes

WILL SOMEONE PLEASE TELL ME, the bright red advertisement asks in mock irritation, WHAT A PERSONAL COMPUTER CAN DO? The ad provides not merely an answer, but 100 of them. A personal computer, it says, can send letters at the speed of light, diagnose a sick poodle, custom-tailor an insurance program in minutes, test recipes for beer. Testimonials abound. Michael Lamb of Tucson figured out how a personal computer could monitor anesthesia during surgery; the rock group Earth, Wind and Fire uses one to explode smoke bombs onstage during concerts; the Rev. Ron Jaenisch of Sunnyvale, Calif., programmed his machine so it can recite an entire wedding ceremony.

In the cavernous Las Vegas Convention Center a month ago, more than 1,000 computer companies large and small were showing off their wares, their floppy discs and disc drives, joy sticks and modems, to a mob of some 50,000 buyers, middlemen and assorted technology buffs. Look! Here is Hewlett-Packard's HP9000, on which you can sketch a new airplane, say, and immediately see the results in 3-D through holograph imaging; here is how the Votan can answer and act on a telephone call in the middle of the night from a salesman on the other side of the country; here is the Olivetti M20 that entertains bystanders by drawing garishly colored pictures of Marilyn Monroe; here is a program designed by The Alien Group that enables an Atari computer to say aloud anything typed on its keyboard in any language. It also sings, in a buzzing humanoid voice, *Amazing Grace* and *When I'm 64* or anything else that anyone wants to teach it.

As both the Apple Computer advertisement and the Las Vegas circus indicate, the enduring American love affairs with the automobile and the television set are now being transformed into a giddy passion for the personal computer. This passion is partly fad, partly a sense of how life could be made better, partly a gigantic sales campaign. Above all, it is the end result of a technological revolution that has been in the making for four decades and is now, quite literally, hitting home.

Americans are receptive to the revolution and optimistic about its impact. A new poll* for TIME by Yankelovich, Skelly and White indicates that nearly 80% of Americans expect that in the fairly near future, home computers will be as commonplace as television sets or dishwashers. Although they see dangers of unemployment and dehumanization, solid majorities feel that the computer revolution will ultimately raise production and therefore living standards (67%), and that it will improve the quality of their children's education (68%).

The sales figures are awesome and will become more so. In 1980 some two dozen firms sold 724,000 personal computers for $1.8 billion. The following year 20 more companies joined the stampede, including giant IBM, and sales doubled to 1.4 million units at just under $3 billion. When the final figures are in for 1982, according to Dataquest, a California research firm, more than 100 companies will probably have sold 2.8 million units for $4.9 billion.

To be sure, the big, complex, costly "mainframe" computer has been playing an increasingly important role in practically everyone's life for the past quarter-century. It predicts the weather, processes checks, scrutinizes tax returns, guides intercontinental missiles and performs innumerable other operations for governments and corporations. The computer has made possible the exploration of space. It has changed the way wars are fought, as the Exocet missile proved in the South Atlantic and Israel's electronically sophisticated forces did in Lebanon.

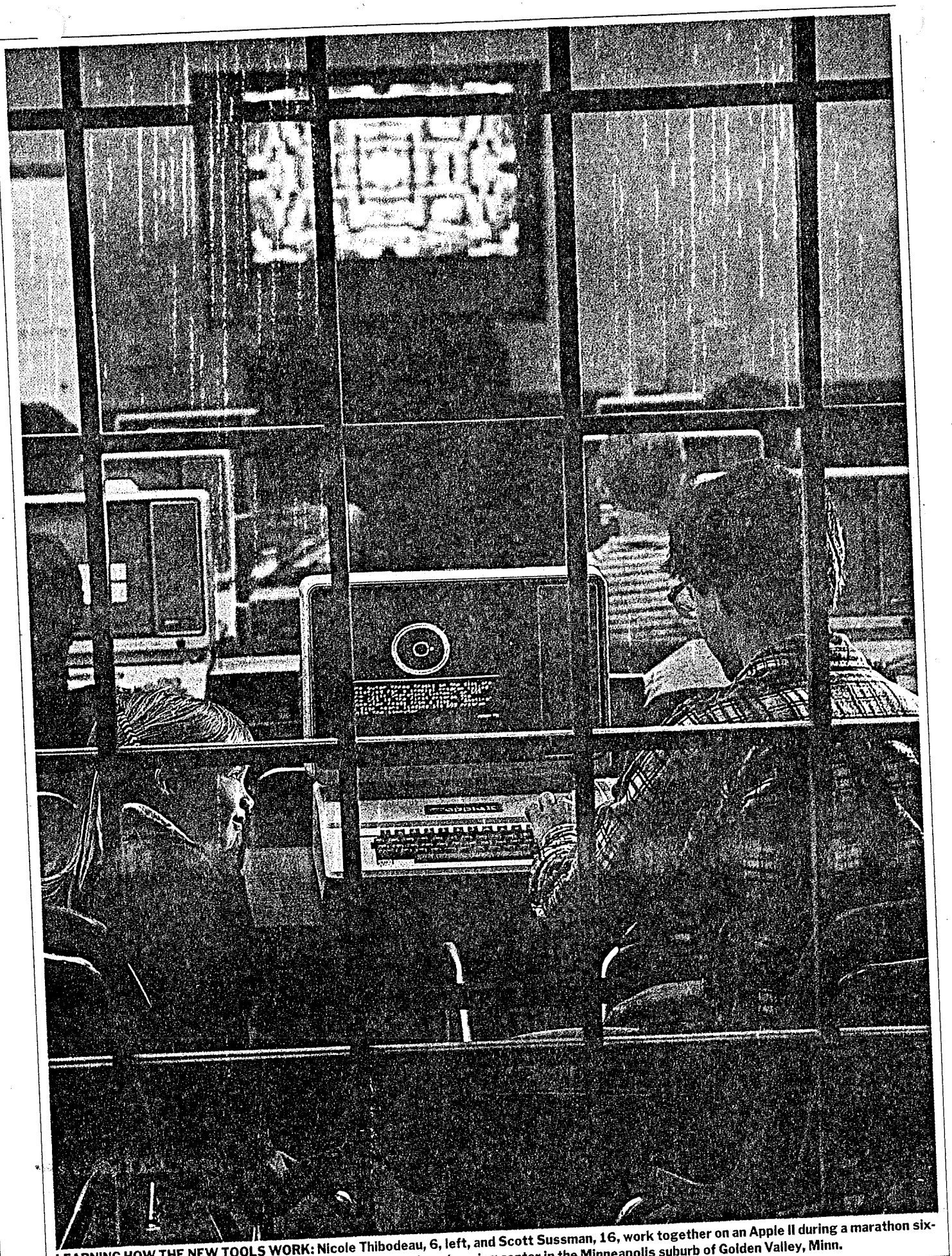
Despite its size, however, the mainframe does its work all but invisibly, behind the closed doors of a special, climate-controlled room. Now, thanks to the transistor and the silicon chip, the computer has been reduced so dramatically in both bulk and price that it is accessible to millions. In 1982 a cascade of computers beeped and blipped their way into the American office, the American school, the American home. The "information revolution" that futurists have long predicted has arrived, bringing with it the promise of dramatic changes in the way people live and work, perhaps even in the way they think. America will never be the same.

In a larger perspective, the entire world will never be the same. The industrialized nations of the West are already scrambling to computerize (1982 sales: 435,000 in Japan, 392,000 in Western Europe). The effect of the machines on the Third World is more uncertain. Some experts argue that computers will, if anything, widen the gap between haves and have-nots. But the prophets of high technology believe the computer is so cheap and so powerful that it could enable underdeveloped nations to bypass the whole industrial revolution. While robot factories could fill the need for manufactured goods, the microprocessor would create myriad new industries, and an international computer network could bring important agricultural and medical information to even the most remote villages. "What networks of railroads, highways and canals were in another age, networks of telecommunications, information and computerization . . . are today," says Austrian Chancellor Bruno Kreisky. Says French Editor Jean-Jacques Servan-Schreiber, who believes that the computer's teaching capability can conquer the Third World's illiteracy and even its tradition of high birth rates: "It is the source of new life that has been delivered to us."

The year 1982 was filled with notable events around the globe. It was a year in which death finally pried loose Leonid Brezhnev's frozen grip on the Soviet Union, and Yuri Andropov, the cold-eyed ex-chief of the KGB, took command. It was a year in which Israel's truculent Prime Minister Menachem Begin completely redrew the power map of the Middle East by invading neighboring Lebanon and smashing the Palestinian guerrilla forces there. The military campaign was a success, but all the world looked with dismay at the thunder of Israeli bombs on Beirut's civilians and at the massacres in the Palestinian refugee camps. It was a year in which Argentina tested the decline of European power by seizing the Falkland Islands, only to see Britain, led by doughty Margaret Thatcher, meet the test by taking them back again.

Nor did all of the year's major news derive from wars or the threat of international violence. Even as Ronald Reagan cheered the sharpest decline in the U.S. inflation rate in ten years, 1982 brought the worst unemployment since the Great Depression (12 million jobless) as well as budget deficits that may reach an unprecedented $180 billion in fiscal 1983. High unemployment plagued Western Europe as well, and the multibillion-dollar debts of more than two dozen nations gave international financiers a severe fright. It was also a year in which the first artificial heart began pumping life inside a dying man's chest, a year in which millions cheered the birth of cherubic Prince William Arthur Philip Louis of Britain, and millions more

*The telephone survey of 1,019 registered voters was conducted on Dec. 8 and 9. The margin of sampling error is plus or minus 3%.



LEARNING HOW THE NEW TOOLS WORK: Nicole Thibodeau, 6, left, and Scott Sussman, 16, work together on an Apple II during a marathon six-hour training session run by the Computer Learning Center in a shopping center in the Minneapolis suburb of Golden Valley, Minn.

Photograph for TIME by David Burnett—Contact

rooted for a wrinkled, turtle-like figure struggling to find its way home to outer space.

There are some occasions, though, when the most significant force in a year's news is not a single individual but a process, and a widespread recognition by a whole society that this process is changing the course of all other processes. That is why, after weighing the ebb and flow of events around the world, TIME has decided that 1982 is the year of the computer. It would have been possible to single out as Man of the Year one of the engineers or entrepreneurs who masterminded this technological revolution, but no one person has clearly dominated those turbulent events. More important, such a selection would obscure the main point. TIME's Man of the Year for 1982, the greatest influence for good or evil, is not a man at all. It is a machine: the computer.

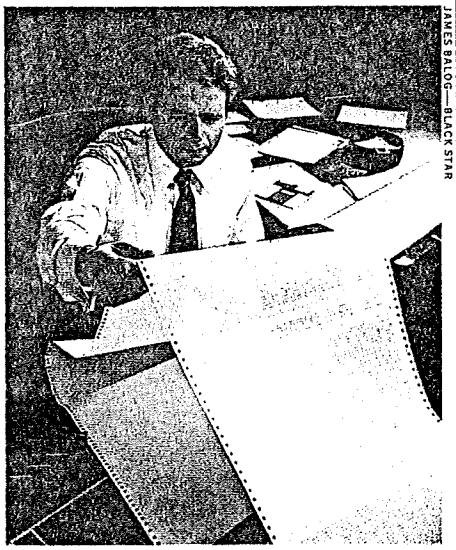
It is easy enough to look at the world around us and conclude that the computer has not changed things all that drastically. But one can conclude from similar observations that the earth is flat, and that the sun circles it every 24 hours. Although everything seems much the same from one day to the next, changes under the surface of life's routines are actually occurring at almost unimaginable speed. Just 100 years ago, parts of New York City were lighted for the first time by a strange new force called electricity; just 100 years ago, the German Engineer Gottlieb Daimler began building a gasoline-fueled internal combustion engine (three more years passed before he fitted it to a bicycle). So it is with the computer.

The first fully electronic digital computer built in the U.S. dates back only to the end of World War II. Created at the University of Pennsylvania, ENIAC weighed 30 tons and contained 18,000 vacuum tubes, which failed at an average of one every seven minutes. The arrival of the transistor and the miniaturized circuit in the 1950s made it possible to reduce a room-size computer to a silicon chip the size of a pea. And prices kept dropping. In contrast to the $487,000 paid for ENIAC, a top IBM personal computer today costs about $4,000, and some discounters offer a basic Timex-Sinclair 1000 for $77.95. One computer expert illustrates the trend by estimating that if the automobile business had developed like the computer business, a Rolls-Royce would now cost $2.75 and run 3 million miles on a gallon of gas.

Looking ahead, the computer industry sees pure gold. There are 83 million U.S. homes with TV sets, 54 million white-collar workers, 26 million professionals, 4 million small businesses. Computer salesmen are hungrily eyeing every one of them. Estimates for the number of personal computers in use by the end of the century run as high as 80 million. Then there are all the auxiliary industries: desks to hold computers, luggage to carry them, cleansers to polish them. "The surface is barely scratched," says Ulric Weil, an analyst for Morgan Stanley.

Beyond the computer hardware lies the virtually limitless market for software, all those prerecorded programs that tell the willing but mindless computer what to do. These discs and cassettes range from John Wiley & Sons' investment analysis program for $59.95 (some run as high as $5,000) to Control Data's PLATO programs that teach Spanish or physics ($45 for the first lesson, $35 for succeeding ones) to a profusion of space wars, treasure hunts and other electronic games.

This most visible aspect of the computer revolution, the video game, is its least significant. But even if the buzz and clang of the arcades is largely a teen-age fad, doomed to go the way of Rubik's Cube and the Hula Hoop, it is nonetheless a remarkable phenomenon. About 20 corporations are selling some 250 different game cas-



JAMES BALOG—BLACK STAR

ANALYZING BUSINESS DATA: Transamerica Executive Frank Herringer studies print-outs

settes for roughly $2 billion this year. According to some estimates, more than half of all the personal computers bought for home use are devoted mainly to games.

Computer enthusiasts argue that these games have educational value, by teaching logic, or vocabulary, or something. Some are even used for medical therapy. Probably the most important effect of these games, however, is that they have brought a form of the computer into millions of homes and convinced millions of people that it is both pleasant and easy to operate, what computer buffs call "user friendly." Games, says Philip D. Estridge, head of IBM's personal computer operations, "aid in the discovery process."

Apart from games, the two things that the computer does best have wide implications but are quite basic. One is simply computation, manipulating thousands of numbers per second. The other is the ability to store, sort through and rapidly retrieve immense amounts of information. More than half of all employed Americans now earn their living not by producing things but as "knowledge workers," exchanging various kinds of information, and the personal computer stands ready to change how all of them do their jobs.

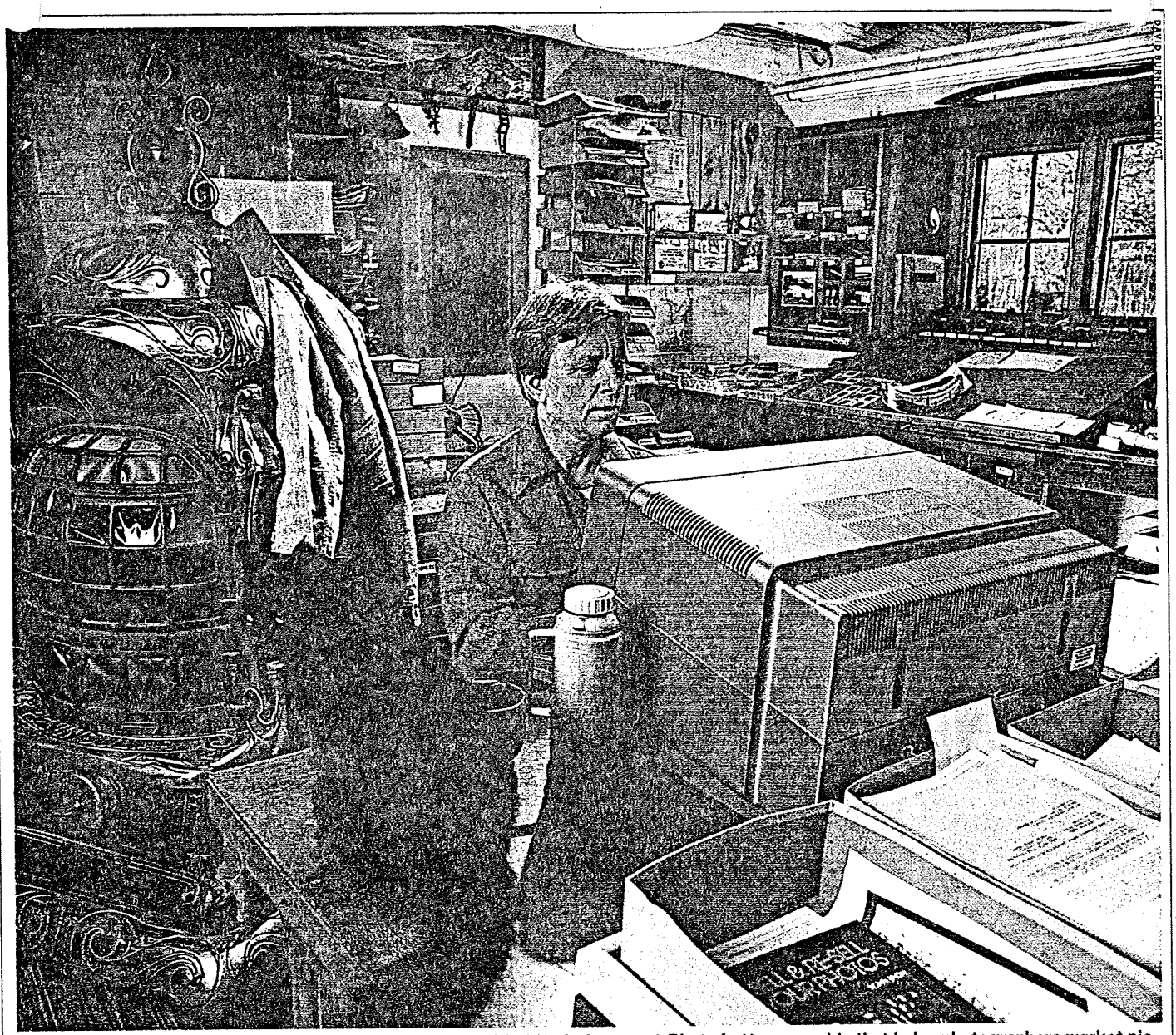
▶ Frank Herringer, a group vice president of Transamerica Corp., installed an Apple in his suburban home in Lafayette, Calif., and spent a weekend analyzing various proposals for Transamerica's $300 million takeover of the New York insurance brokerage firm of Fred S. James Co. Inc. "It allowed me to get a good feel for the critical numbers," says Herringer. "I could work through alternative options, and there were no leaks."

▶ Terry Howard, 44, used to have a long commute to his job at a San Francisco stock brokerage, where all his work involved computer data and telephoning. With a personal computer, he set up his own firm at home in San Rafael. Instead of rising at 6 a.m. to drive to the city, he runs five miles before settling down to work. Says he: "It didn't make sense to spend two hours of every day burning up gas, when my customers on the telephone don't care whether I'm sitting at home or in a high rise in San Francisco."

▶ John Watkins, safety director at Harriet & Henderson Yarns, in Henderson, N.C., is one of 20 key employees whom the company helped to buy home computers and paid to get trained this year. Watkins is trying to design a program that will record and analyze all mill accidents: who was injured, how, when, why. Says he: "I keep track of all the cases that are referred to a doctor, but for every doctor case, there are 25 times as many first-aid cases that should be recorded." Meantime, he has designed a math program for his son Brent and is shopping for a word-processing program to help his wife Mary Edith write her master's thesis in psychology. Says he: "I don't know what it can't do. It's like asking yourself, 'What's the most exciting thing you've ever done?' Well, I don't know because I haven't done it yet."

▶ Aaron Brown, a former defensive end for the Kansas City Chiefs and now an office-furniture salesman in Minneapolis, was converted to the computer by his son Sean, 15, who was converted at a summer course in computer math. "I thought of computers very much as toys," says Brown, "but Sean started telling me, 'You could use a computer in your work.' I said, 'Yeah, yeah, yeah.' " Three years ago, the family took a vote on whether to go to California for a vacation or to buy an Apple. The Apple won, 3 to 1, and to prove its value, Sean wrote his father a program that computes gross profits and commissions on any sale.

Brown started with "simple things," like filing the names and telephone numbers of potential customers. "Say I was going to a particular area of the city," Brown says. "I would ask the computer to pull up the accounts in a certain zip-code area, or if I wanted all the customers who were in-



PUBLISHING A NEWSLETTER AT HOME: Rohn Engh, who with Wife Jeri puts out *Photo Letter*, a weekly that helps photographers market pictures, uses a TRS-80 in the barn that serves as his office in Star Prairie, Wis., to keep track of 1,400 subscribers

terested in whole office systems, I could pull that up too." The payoff: since he started using the computer, he has doubled his annual sales to more than $1 million.

Brown has spent about $1,500 on software, all bound in vinyl notebooks along a wall of his home in Golden Valley, Minn., but Sean still does a lot of programming on his own. He likes to demonstrate one that he designed to teach French. *"Vive la France!"* it says, and then starts beeping the first notes of *La Marseillaise*. His mother Reatha uses the computer to help her manage a gourmet cookware store, and even Sister Terri, who originally cast the family's lone vote against the computer, uses it to store her high school class notes. Says Brown: "It's become kind of like the bathroom. If someone is using it, you wait your turn."

Reatha Brown has been lobbying for a new carpet, but she is becoming resigned to the prospect that the family will acquire a new hard-disc drive instead. "The videocassette recorder," she sighs, pointing across the room, "that was my other carpet." Replies her husband, setting forth an argument that is likely to be replayed in millions of households in the years just ahead: "We make money with the computer, but all we can do with a new carpet is walk on it. Somebody once said there were five reasons to spend money: on necessities, on investments, on self-improvement, on memories and to impress your friends. The carpet falls in that last category, but the computer falls in all five."

By itself, the personal computer is a machine with formidable capabilities for tabulating, modeling or recording. Those capabilities can be multiplied almost indefinitely by plugging it into a network of other computers. This is generally done by attaching a desktop model to a telephone line (two-way cables and earth satellites are coming increasingly into use). One can then dial an electronic data base, which not only provides all manner of information but also collects and transmits messages: electronic mail.

The 1,450 data bases that now exist in the U.S. range from general information services like the Source, a *Reader's Digest* subsidiary in McLean, Va., which can provide stock prices, airline schedules or movie reviews, to more specialized services like the American Medical Association's AMA/NET, to real esoterica like the Hughes Rotary Rig Report. Fees vary from $300 an hour to less than $10.

Just as the term personal computer can apply to both a home machine and an office machine (and indeed blurs the distinction between the two places) many of the first enthusiastic users of these devices have been people who do much of their work at home: doctors, lawyers, small businessmen, writers, engineers. Such people also have special needs for the networks of specialized data.

Orthopedic Surgeon Jon Love, of Madisonville, Ky., connects the Apple in his home to both the AMA/NET, which

offers, among other things, information on 1,500 different drugs, and Medline, a compendium of all medical articles published in the U.S. "One day I accessed the computer three times in twelve minutes," he says. "I needed information on arthritis and cancer in the leg. It saved me an hour and a half of reading time. I want it to pay me back every time I sit down at it."

Charles Manly III practices law in Grinnell, Iowa (pop. 8,700), a town without a law library, so he pays $425 a month to connect his CPT word processor to Westlaw, a legal data base in St. Paul. Just now he needs precedents in an auto insurance case. He dials the Westlaw telephone number, identifies himself by code, then types: "Courts (Iowa) underinsurance." The computer promptly tells him there is only one such Iowa case, and it is 14 years old. Manly asks for a check on other Midwestern states, and it gives him a long list of precedents in Michigan and Minnesota. "I'm not a chiphead," he says, "but if you don't keep up with the new developments, even in a rural general practice, you're not going to have the competitive edge."

The personal computer and its networks are even changing that oldest of all home businesses, the family farm. Though only about 3% of commercial farmers and ranchers now have computers, that number is expected to rise to nearly 20% within the next five years. One who has grasped the true faith is Bob Johnson, who helps run his family's 2,800-acre pig farm near De Kalb, Ill. Outside, the winter's first snowflakes have dusted the low-slung roofs of the six red-and-white barns and the brown fields specked with corn stubble. Inside the two-room office building, Johnson slips a disc into his computer and types "D" (for dial) and a telephone number. He is immediately connected to the Illinois farm bureau's newly computerized AgriVisor service. It not only gives him weather conditions to the west and the latest hog prices on the Chicago commodities exchange, but also offers advice. Should farmers continue to postpone the sale of their newly harvested corn? "Remember," the computer counsels, "that holding on for a dime or a nickel may not be worth the long-term wait."

Johnson started out playing computer games on an Apple II, but then "those got shoved in the file cabinet." He began computerizing all his farm records, which was not easy. "We could keep track of the hogs we sold in dollars, but we couldn't keep track of them by pounds and numbers at the same time." He started shopping around and finally acquired a $12,000 combination at a shop in Lafayette, Ind.: a microcomputer from California Computer Systems, a video screen from Ampex, a Diablo word printer and an array of agricultural programs.

Johnson's computer now knows the yields on 35 test plots of corn, the breeding records of his 300 sows, how much feed his hogs have eaten (2,787,260 lbs.) and at what cost ($166,047.73). "This way, you can charge your hogs the cost of the feed when you sell them and figure out if you're making any money," says Johnson. "We never had this kind of information before. It would have taken too long to calculate. But we knew we needed it."

Just as the computer is changing the way work is done in home offices, so it is revolutionizing the office. Routine tasks like managing payrolls and checking inventories have long since been turned over to computers, but now the typewriter is giving way to the word processor, and every office thus becomes part of a network. This change has barely begun; about 10% of the typewriters in the 500 largest industrial corporations have so far been replaced. But the economic imperatives are inescapable. All told, office professionals could save about 15% of their time if they used the technology now available, says a study by Booz, Allen & Hamilton, and that technology is constantly improving. In one survey of corporations, 55% said they were planning to acquire the latest equipment. This technology involves not just word processors but computerized electronic message systems that could eventually make paper obsolete, and wall-size, two-way TV teleconference screens that will obviate traveling to meetings.

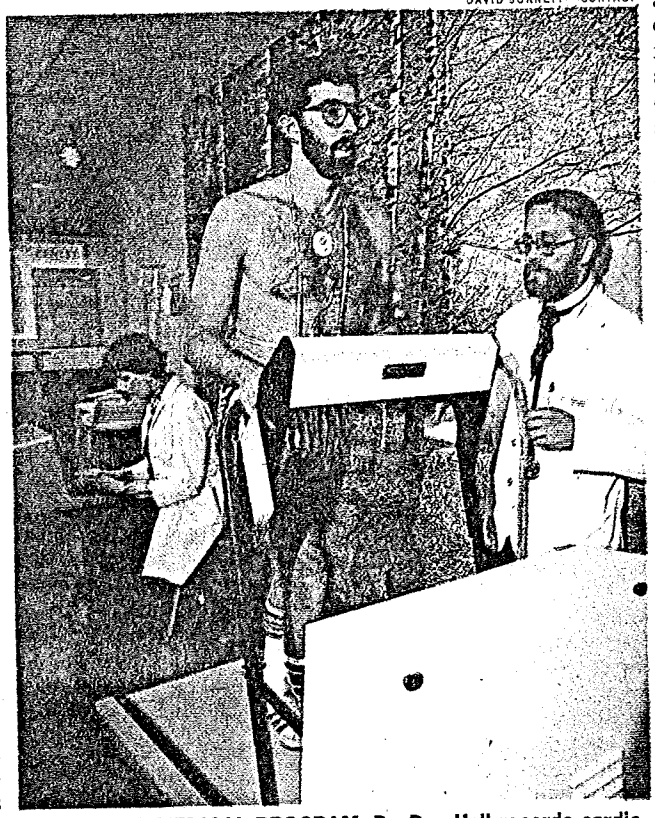
The standard home computer is sold only to somebody who wants one, but the same machine can seem menacing when it appears in an office. Secretaries are often suspicious of new equipment, particularly if it appears to threaten their jobs, and so are executives. Some senior officials resist using a keyboard on the ground that such work is demeaning. Two executives in a large firm reportedly refuse to read any computer print-out until their secretaries have retyped it into the form of a standard memo. "The biggest problem in introducing computers into an office is management itself," says Ted Stout of National Systems Inc., an office design firm in Atlanta. "They don't understand it, and they are scared to death of it."

But there is an opposite fear that drives anxious executives toward the machines: the worry that younger and more sophisticated rivals will push ahead of them. "All you have to do," says Alexander Horniman, an industrial psychologist at the University of Virginia's Darden School of Business, "is walk down the hall and see people using the computer and imagine they have access to all sorts of information you don't." Argues Harold Todd, executive vice president at First Atlanta Bank: "Managers who do not have the ability to use a terminal within three to five years may become organizationally dysfunctional." That is to say, useless.

If more and more offices do most of their work on computers, and if a personal computer can be put in a living room, why should anyone have to go to work in an office at all? The question can bring a stab of hope to anybody who spends hours every day on the San Diego Freeway or the Long Island Rail Road. Nor is "telecommuting" as unrealistic as it sounds. Futurist Jack Nilles of the University of Southern California has estimated that any home computer would soon pay for itself from savings in commuting expenses and in city office rentals.

Is the great megalopolis, the marketplace of information, about to be doomed by the new technology? Another futurist, Alvin Toffler, suggests at least a trend in that direction. In his 1980 book, *The Third Wave*, he portrays a 21st century world in which the computer revolution has canceled out many of the fundamental changes wrought by the Industrial Revolution: the centralization and standardization of work in the factory, the office, the assembly line. These changes may seem eternal, but they are less than two centuries old. Instead, Toffler imagines a revived version of pre-industrial life in what he has named "the electronic cottage," a utopian abode where all members of the family work, learn and enjoy their leisure

DAVID BURNETT—CONTACT



CHECKING A MEDICAL PROGRAM: Dr. Don Hall records cardiovascular-fitness test results on a TRS-80 in Portland, Ore.

around the electronic hearth, the computer. Says Vice President Louis H. Mertes of the Continental Illinois Bank and Trust Co. of Chicago, who is such a computer enthusiast that he allows no paper to be seen in his office (though he does admit to keeping a few files in the drawer of an end table): "We're talking when—not if—the electronic cottage will emerge."

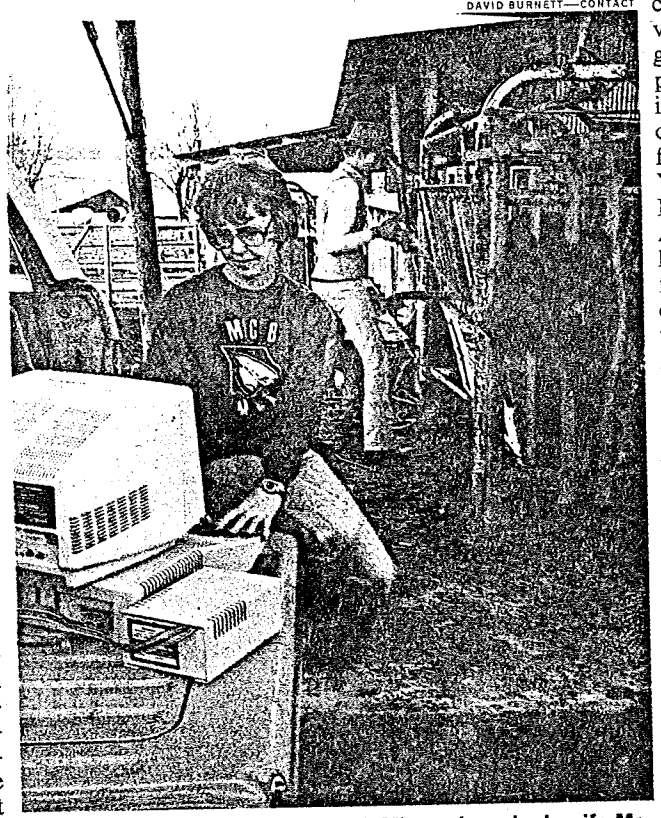
Continental Illinois has experimented with such electronic cottages by providing half a dozen workers with word processors so they could stay at home. Control Data tried a similar experiment and ran into a problem: some of its 50 "alternate site workers" felt isolated, deprived of their social life around the water cooler. The company decided to ask them to the office for lunch and meetings every week. "People are like ants, they're communal creatures," says Dean Scheff, chairman and founder of CPT Corp., a word-processing firm near Minneapolis. "They need to interact to get the creative juices flowing. Very few of us are hermits."

TIME's Yankelovich poll underlines the point. Some 73% of the respondents believed that the computer revolution would enable more people to work at home. But only 31% said they would prefer to do so themselves. Most work no longer involves a hayfield, a coal mine or a sweatshop, but a field for social intercourse. Psychologist Abraham Maslow defined work as a hierarchy of functions: it first provides food and shelter, the basics, but then it offers security, friendship, "belongingness." This is not just a matter of trading gossip in the corridors; work itself, particularly in the information industries, requires the stimulation of personal contact in the exchange of ideas: sometimes organized conferences, sometimes simply what is called "the schmooze factor." Says Sociologist Robert Schrank: "The workplace performs the function of community."

But is this a basic psychological reality or simply another rut dug by the Industrial Revolution? Put another way, why do so many people make friends at the office rather than among their neighbors? Prophets of the electronic cottage predict that it will once again enable people to find community where they once did: in their communities. Continental Illinois Bank, for one, has opened a suburban "satellite work station" that gets employees out of the house but not all the way downtown. Ford, Atlantic Richfield and Merrill Lynch have found that teleconferencing can reach far more people for far less money than traditional sales conferences.

Whatever the obstacles, telecommuting seems particularly rich with promise for millions of women who feel tied to the home because of young children. Sarah Sue Hardinger has a son, 3, and a daughter three months old; the computer in her cream-colored stucco house in South Minneapolis is surrounded by children's books, laundry, a jar of Dippity Do. An experienced programmer at Control Data before she decided to have children, she now settles in at the computer right after breakfast, sometimes holding the baby in a sling. She starts by reading her computer mail, then sets to work converting a PLATO grammar program to a disc that will be compatible with Texas Instruments machines. "Mid-morning I have to start paying attention to the three-year-old, because he gets antsy," says Hardinger. "Then at 11:30 comes *Sesame Street* and *Mr. Rogers,* so that's when I usually get a whole lot done." When her husband, a building contractor, comes home and takes over the children, she returns to the computer. "I use part of my house time for work, part of my work time for the house," she says. "The baby has demand feeding; I have demand working."

DAVID BURNETT—CONTACT



KEEPING UP DOWN ON THE FARM: Missouri rancher's wife Melesa Beckett uses her computer to update records on 350 cattle

To the nation's 10 million physically handicapped, telecommuting encourages new hopes of earning a livelihood. A Chicago-area organization called Lift has taught computer programming to 50 people with such devastating afflictions as polio, cerebral palsy and spinal damage. Lift President Charles Schmidt cites a 46-year-old man paralyzed by polio: "He never held a job in his life until he entered our program three years ago, and now he's a programmer for Walgreens."

Just as the vast powers of the personal computer can be vastly multiplied by plugging it into an information network, they can be extended in all directions by attaching the mechanical brain to sensors, mechanical arms and other robotic devices. Robots are already at work in a large variety of dull, dirty or dangerous jobs: painting automobiles on assembly lines and transporting containers of plutonium without being harmed by radiation. Because a computerized robot is so easy to reprogram, some experts foresee drastic changes in the way manufacturing work is done: toward customization, away from assembly-line standards. When the citizen of tomorrow wants a new suit, one futurist scenario suggests, his personal computer will take his measurements and pass them on to a robot that will cut his choice of cloth with a laser beam and provide him with a perfectly tailored garment. In the home too, computer enthusiasts delight in imagining machines performing the domestic chores. A little of that fantasy is already reality. New York City Real Estate Executive David Rose, for example, uses his Apple in business deals, to catalogue his 4,000 books and to write fund-raising letters to his Yale classmates. But he also uses it to wake him in the morning with soft music, turn on the TV, adjust the lights and make the coffee.

In medicine, the computer, which started by keeping records and sending bills, now suggests diagnoses. CADUCEUS knows some 4,000 symptoms of more than 500 diseases; MYCIN specializes in infectious diseases; PUFF measures lung functions. All can be plugged into a master network called SUMEX-AIM, with headquarters at Stanford in the West and Rutgers in the East. This may all sound like another step toward the disappearance of the friendly neighborhood G.P., but while it is possible that a family doctor would recognize 4,000 different symptoms, CADUCEUS is more likely to see patterns in what patients report and can then suggest a diagnosis. The process may sound dehumanized, but in one hospital where the computer specializes in peptic ulcers, a survey of patients showed that they found the machine "more friendly, polite, relaxing and comprehensible" than the average physician.

The microcomputer is achieving dramatic effects on the ailing human body. These devices control the pacemakers implanted in victims of heart disease; they pump carefully measured quantities of insulin into the bodies of diabetics; they test blood samples for hundreds of different allergies; they translate sounds into vibrations that the deaf can "hear"; they stimu-

late deadened muscles with electric impulses that may eventually enable the paralyzed to walk.

In all the technologists' images of the future, however, there are elements of exaggeration and wishful thinking. Though the speed of change is extraordinary, so is the vastness of the landscape to be changed. New technologies have generally taken at least 20 years to establish themselves, which implies that a computer salesman's dream of a micro on every desk will not be fulfilled in the very near future. If ever.

Certainly the personal computer is not without its flaws. As most new buyers soon learn, it is not that easy for a novice to use, particularly when the manuals contain instructions like this specimen from Apple: "This character prevents script from terminating the currently forming output line when it encounters the script command in the input stream."

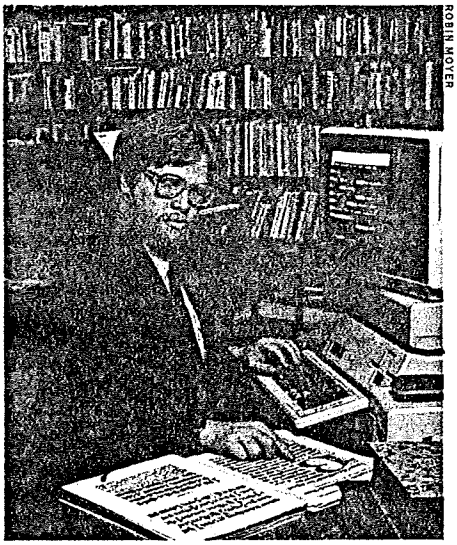
Another problem is that most personal computers end up costing considerably more than the ads imply. The $100 model does not really do very much, and the $1,000 version usually requires additional payments for the disc drive or the printer or the modem. Since there is very little standardization of parts among the dozens of new competitors, a buyer who has not done considerable homework is apt to find that the parts he needs do not fit the machine he bought.

Software can be a major difficulty *(see box)*. The first computer buyers tended to be people who enjoyed playing with their machines and designing their own programs. But the more widely the computer spreads, the more it will have to be used by people who know no more about its inner workings than they do about the insides of their TV sets—and do not want to. They will depend entirely on the commercial programmers. Good programs are expensive both to make and to buy. Control Data has invested $900 million in its PLATO educational series and has not yet turned a profit, though its hopes run into the billions. A number of firms have marketed plenty of shoddy programs, but they are not cheap either. "Software is the new bandwagon, but only 20% of it is any good," says Diana Hestwood, a Minneapolis-based educational consultant. She inserts a math program and deliberately makes ten mistakes. The machine gives its illiterate verdict: "You taken ten guesses." Says Atari's chief scientist, Alan Kay: "Software is getting to be embarrassing."

Many of the programs now being touted are hardly worth the cost, or hardly worth doing at all. Why should a computer be needed to balance a checkbook or to turn off the living-room lights? Or to recommend a dinner menu, particularly when it can consider (as did a $34 item called the Pizza Program) ice cream as an appetizer? Indeed, there are many people who may quite reasonably decide that they can get along very nicely without a computer. Even the most impressive information networks may provide the customer with nothing but a large telephone bill. "You cannot rely on being able to find what you want," says Atari's Kay. "It's really more useful to go to a library."

It is becoming increasingly evident that a fool assigned to work with a computer can conceal his own foolishness in the guise of high-tech authority. Lives there a single citizen who has not been commanded by a misguided computer to pay an income tax installment or department store bill that he has already paid?

What is true for fools is no less true for criminals, who are now able to commit electronic larceny from the comfort of their living rooms. The probable champion is Stanley Mark Rifkin, a computer analyst in Los Angeles, who tricked the machines at the Security Pacific National Bank into giving him $10 million. While


ROBIN MOYER

CATALOGUING A BOOK COLLECTION: David Rose also uses his Apple to awaken him

free on bail for that in 1979 (he was eventually sentenced to eight years), he was arrested for trying to steal $50 million from Union Bank (the charges were eventually dropped). According to Donn Parker, a specialist in computer abuse at SRI International (formerly the Stanford Research Institute), "Nobody seems to know exactly what computer crime is, how much of it there is, and whether it is increasing or decreasing. We do know that computers are changing the nature of business crime significantly."

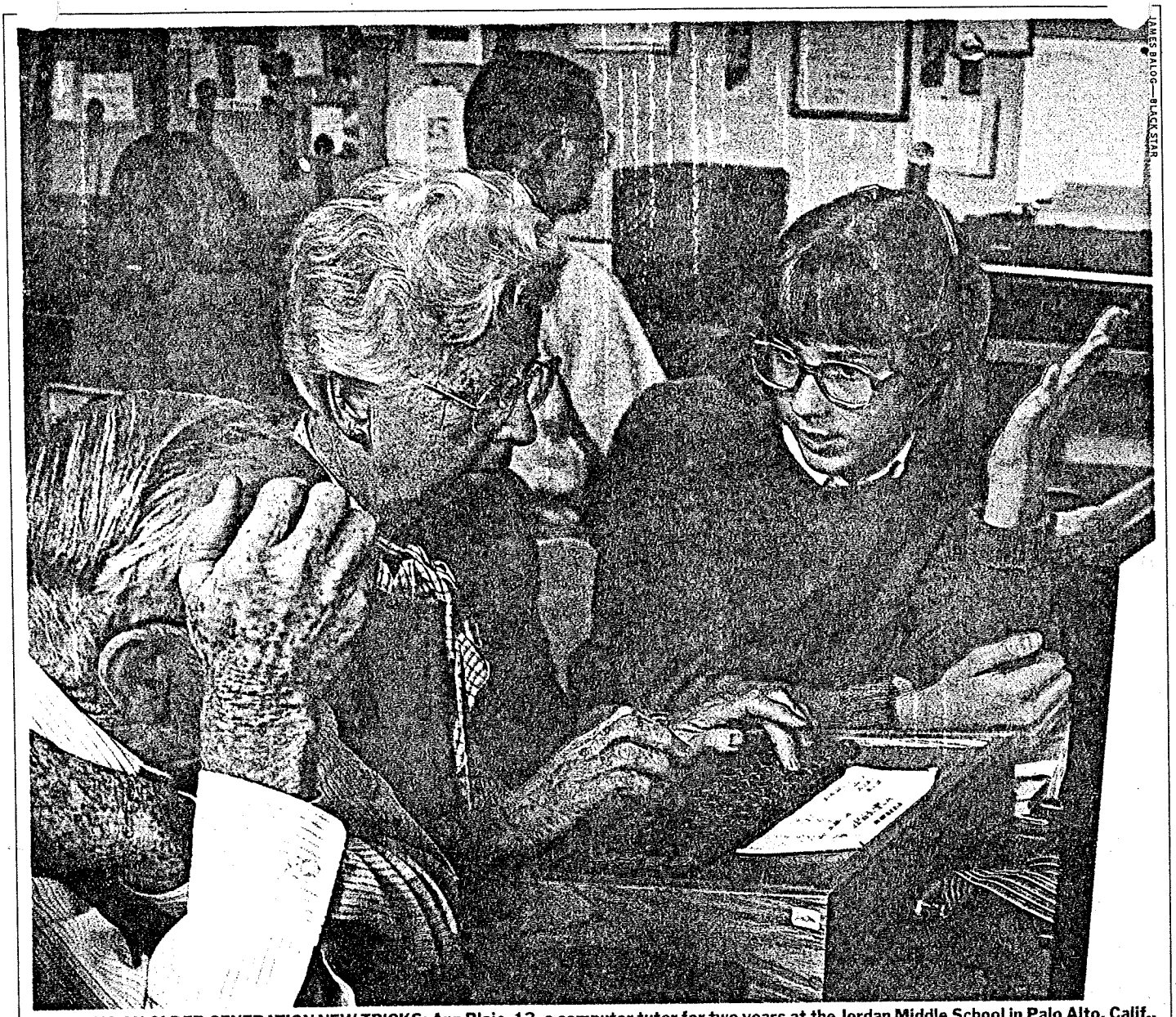
Even if all the technical and intellectual problems can be solved, there are major social problems inherent in the computer revolution. The most obvious is unemployment, since the basic purpose of commercial computerization is to get more work done by fewer people. One British study predicts that "automation-induced unemployment" in Western Europe could reach 16% in the next decade, but most analyses are more optimistic. The general rule seems to be that new technology eventually creates as many jobs as it destroys, and often more. "People who put in computers usually increase their staffs as well," says CPT's Scheff. "Of course," he adds, "one industry may kill another industry. That's tough on some people."

Theoretically, all unemployed workers can be retrained, but retraining programs are not high on the nation's agenda. Many new jobs, moreover, will require an aptitude in using computers, and the retraining needed to use them will have to be repeated as the technology keeps improving. Says a chilling report by the Congressional Office of Technology Assessments: "Lifelong retraining is expected to become the norm for many people." There is already considerable evidence that the schoolchildren now being educated in the use of computers are generally the children of the white middle class. Young blacks, whose unemployment rate stands today at 50%, will find another barrier in front of them.

Such social problems are not the fault of the computer, of course, but a consequence of the way the American society might use the computer. "Even in the days of the big mainframe computers, they were a machine for the few," says Katharine Davis Fishman, author of *The Computer Establishment*. "It was a tool to help the rich get richer. It still is to a large extent. One of the great values of the personal computer is that smaller concerns, smaller organizations can now have some of the advantages of the bigger organizations."

How society uses its computers depends greatly on what kind of computers are made and sold, and that depends, in turn, on an industry in a state of chaotic growth. Even the name of the product is a matter of debate: "microcomputer" sounds too technical, but "home computer" does not fit an office machine. "Desktop" sounds awkward, and "personal computer" is at best a compromise. Innovators are pushing off in different directions. Hewlett Packard is experimenting with machines that respond to vocal commands; Osborne is leading a rush toward portable computers, ideally no larger than a book. And for every innovator, there are at least five imitators selling copies.

There is much talk of a coming shakeout, and California Consultant David E. Gold predicts that perhaps no more than a dozen vendors will survive the next five years. At the moment, Dataquest estimates that Texas Instruments leads the low-price parade with a 35% share of the market in computers selling for less than $1,000. Next come Timex (26%), Commodore (15%) and Atari (13%). In the race among machines priced between $1,000 and $5,000, Apple still commands 26%, followed by IBM (17%) and Tandy/Radio Shack (10%). But IBM, which has dominated the mainframe computer market for decades, is coming on very strong. Apple, fighting back, will unveil its new Lisa model in January, putting great emphasis on user friendliness. The user will be able



TEACHING AN OLDER GENERATION NEW TRICKS: Ann Blais, 13, a computer tutor for two years at the Jordan Middle School in Palo Alto, Calif., explains the mysteries of programming to two adventurous septuagenarians, Virgil and Gretchen Miles

to carry out many functions simply by pointing to a picture of what he wants done rather than typing instructions. IBM is also reported to be planning to introduce new machines in 1983, as are Osborne and others.

Just across the horizon, as usual, lurk the Japanese. During the 1970s, U.S. computer manufacturers complacently felt that they were somehow immune from the Japanese combination of engineering and salesmanship that kept gnawing at U.S. auto, steel and appliance industries. One reason was that the Japanese were developing their large domestic market. When they belatedly entered the U.S. battlefield, they concentrated not on selling whole systems but on particular sectors—with dramatic results. In low-speed printers using what is known as the dot-matrix method, the Japanese had only a 6% share of the market in 1980; in 1982, they provided half the 500,000 such printers sold in the U.S. Says Computerland President Ed Faber: "About 75% of the dot-matrix printers we sell are Japanese, and almost all the monitors. There is no better quality electronics than what we see coming from Japan."

Whatever its variations, there is an inevitability about the computerization of America. Commercial efficiency requires it, Big Government requires it, modern life requires it, and so it is coming to pass. But the essential element in this sense of inevitability is the way in which the young take to computers: not as just another obligation imposed by adult society but as a game, a pleasure, a tool, a system that fits naturally into their lives. Unlike anyone over 40, these children have grown up with TV screens; the computer is a screen that responds to them, hooked to a machine that can be programmed to respond the way they want it to. That is power.

There are now more than 100,000 computers in U.S. schools, compared with 52,000 only 18 months ago. This is roughly one for every 400 pupils. The richer and more progressive states do better. Minnesota leads with one computer for every 50 children and a locally produced collection of 700 software programs. To spread this development more evenly and open new doors for business, Apple has offered to donate one computer to every public school in the U.S.—a total of 80,000 computers worth $200 million retail—if Washington will authorize a 25% tax write-off (as is done for donations of scientific equipment to colleges). Congress has so far failed to approve the idea, but California has agreed to a similar proposal.

Many Americans concerned about the erosion of the schools put faith in the computer as a possible savior of their children's education, at school and at home. The Yankelovich poll showed that 57% thought personal computers would enable children to read and to do arithmetic better. Claims William Ridley, Control Data's vice president for education strategy: "If you want to improve youngsters one

grade level in reading, our PLATO program with teacher supervision can do it up to four times faster and for 40% less expense than teachers alone."

No less important than this kind of drill, which some critics compare with the old-fashioned flash cards, is the use of computers to teach children about computers. They like to learn programming, and they are good at it, often better than their teachers, even in the early grades. They treat it as play, a secret skill, unknown among many of their parents. They delight in cracking corporate security and filching financial secrets, inventing new games and playing them on military networks, inserting obscene jokes into other people's programs. In soberer versions that sort of skill will become a necessity in thousands of jobs opening up in the future. Beginning in 1986, Carnegie-Mellon University expects to require all of its students to have their own personal computers. "People are willing to spend a large amount of money to educate their children," says Author Fishman. "So they're all buying computers for Johnny to get a head start (though I have not heard anyone say, 'I am buying a computer for Susie')."

This transformation of the young raises a fundamental and sometimes menacing question: Will the computer change the very nature of human thought? And if so, for better or worse? There has been much time wasted on the debate over whether computers can be made to think, as HAL seemed to be doing in *2001,* when it murdered the astronauts who might challenge its command of the spaceflight. That answer is simple: computers do not think, but they do simulate many of the processes of the human brain: remembering, comparing, analyzing. And as people rely on the computer to do things that they used to do inside their heads, what happens to their heads?

Will the computer's ability to do routine work mean that human thinking will shift to a higher level? Will IQs rise? Will there be more intellectuals? The computer may make a lot of learning as unnecessary as memorizing the multiplication tables. But if a dictionary stored in the computer's memory can easily correct any spelling mistakes, what is the point of learning to spell? And if the mind is freed from intellectual routine, will it race off in pursuit of important ideas or lazily spend its time on more video games?

Too little is known about how the mind works, and less about how the computer might change that process. The neurological researches of Mark Rosenzweig and his colleagues at Berkeley indicate that animals trained to learn and assimilate information develop heavier cerebral cortices, more glial cells and bigger nerve cells. But does the computer really stimulate the brain's activity or, by doing so much of its work, permit it to go slack?

Some educators do believe they see the outlines of change. Seymour Papert, professor of mathematics and education at M.I.T. and author of *Mindstorms: Children, Computers and Powerful Ideas,* invented the computer language named Logo, with which children as young as six can program computers to design mathematical figures. Before they can do that, however, they must learn how to analyze a problem logically, step by step. "Getting a computer to do something," says Papert, "requires the underlying process to be described, on some level, with enough precision to be carried out by the machine." Charles P. Lecht, president of the New York consulting firm Lecht Scientific, argues that "what the lever was to the body, the computer system is to the mind." Says he: "Computers help teach kids to think. Beyond that, they motivate people to think. There is a great difference between intelligence and manipulative capacity. Computers help us to realize that difference."

The argument that computers train minds to be logical makes some experts want to reach for the computer key that says ERASE. "The last thing you want to do is think more logically," says Atari's Kay. "The great thing about computers is that they have no gravity systems. The logical system is one that you make up. Computers are a wonderful way of being bizarre."

Sherry Turkle, a sociologist now finishing a book titled *The Intimate Machine: Social and Cultural Studies of Computers and People,* sees the prospect of change in terms of perceptions and feelings. Says she: "Children define what's special about people by contrasting them with their nearest neighbors, which have always been the animals. People are special because they know how to think. Now children who work with computers see the computer as their nearest neighbor, so they see that people are special because they feel. This may become much more central to the way people think about themselves. We may be moving toward a re-evaluation of what makes us human."

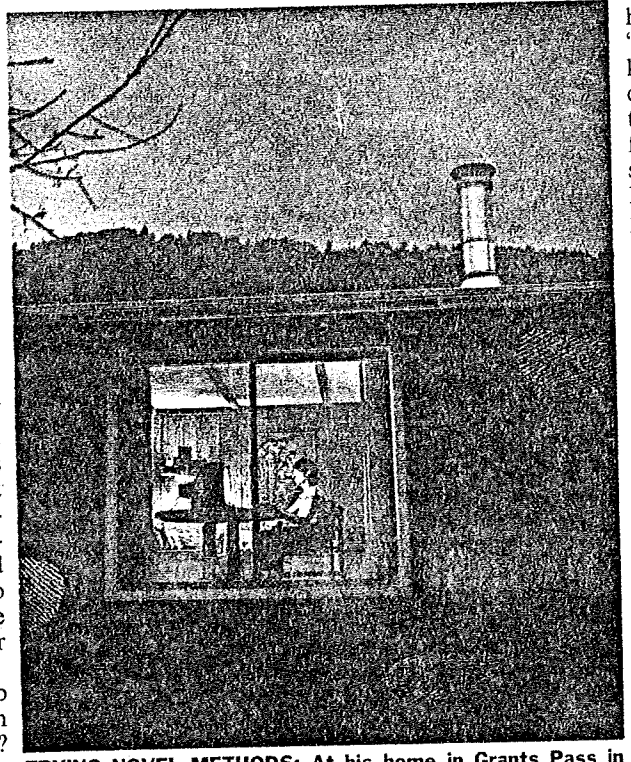
For all such prophecies, M.I.T. Computer Professor Joseph Weizenbaum has answers ranging from disapproval to scorn. He has insisted that "giving children computers to play with . . . cannot touch . . . any real problem," and he has described the new computer generation as "bright young men of disheveled appearance [playing out] megalomaniacal fantasies of omnipotence."

Weizenbaum's basic objection to the computer enthusiasts is that they have no sense of limits. Says he: "The assertion that all human knowledge is encodable in streams of zeros and ones—philosophically, that's very hard to swallow. In effect, the whole world is made to seem computable. This generates a kind of tunnel vision, where the only problems that seem legitimate are problems that can be put on a computer. There is a whole world of real problems, of human problems, which is essentially ignored."

So the revolution has begun, and as usually happens with revolutions, nobody can agree on where it is going or how it will end. Nils Nilsson, director of the Artificial Intelligence Center at SRI International, believes the personal computer, like television, can "greatly increase the forces of both good and evil." Marvin Minsky, another of M.I.T.'s computer experts, believes the key significance of the personal computer is not the establishment of an intellectual ruling class, as some fear, but rather a kind of democratization of the new technology. Says he: "The desktop revolution has brought the tools that only professionals have had into the hands of the public. God knows what will happen now."

Perhaps the revolution will fulfill itself only when people no longer see anything unusual in the brave New World, when they see their computer not as a fearsome challenger to their intelligence but as a useful linkup of some everyday gadgets: the calculator, the TV and the typewriter. Or as Osborne's Adam Osborne puts it: "The future lies in designing and selling computers that people don't realize are computers at all." ***—By Otto Friedrich. Reported by Michael Moritz/San Francisco, J. Madeleine Nash/Chicago and Peter Stoler/New York***

DAVID BURNETT—CONTACT



TRYING NOVEL METHODS: At his home in Grants Pass in southwestern Oregon, Don Hentich practices on his Atari

COMMITTEE REPORT

TO: Legislative Coordinating Council

FROM: Special Committee on Data Processing

RE: PROPOSAL NO. 8 - DATA PROCESSING

Proposal No. 8 directed the Special Committee on Data Processing to:

> study the current operations and financing of the Division of Information Systems and Computing and alternatives for continued legislative oversight, including standards and procedures for legislative evaluation of systems development, structure of the rate base, coordination of agency budget estimates and DISC financing, future growth and cost implications of that growth.

Background

Studies of the state's experience and needs with respect to data processing dates back at least as far as 1968 to a study commissioned by the Department of Administration. In the 1970s, major studies were conducted by a Special Committee on Ways and Means (1976) and by the Governor's Task Force on Effective Management. The study that perhaps had the most influence on later decisions was conducted in 1979 by Dr. Richard Mann, University of Kansas, and culminated in legislation in the 1980 Session creating the Division of Information Systems and Computing (DISC).

The new Division was given substantial authority over the state's data processing activities (excluding the Regents' institutions) and was directed to embark upon a number of projects that had been identified as pressing. Concurrently a new audit and control staff was created within DISC with primary responsibility for preparation of a comprehensive plan, review of agency data processing requests, and recommendations to the Budget Division as to the technical and management merits of those requests.

The rapid growth in DISC's budget in subsequent years sparked new concern about management of that growth and the adequacy of legislative oversight. Another concern was expressed by the Director of DISC at the beginning of the 1982 Session regarding the accuracy with which agencies had budgeted for their data processing needs. Both concerns were, in part, responsible for creation of a Joint Committee on Review of DISC late in the 1982 Session. That Committee recommended further study, noting that time constraints severely limited the scope of their investigation.

Committee Proceedings

The Committee received a staff memorandum which reviewed in detail the evolution of DISC, including findings of earlier legislative and executive studies and summaries of more recent issues and concerns that have emerged. Later memoranda summarized more specifically some budget and financing issues with respect to DISC and reviewed a National Association of State Information Systems survey of computer operations in other states.

Testimony of Conferees. The Committee invited representatives of agencies who use DISC services, with particular emphasis on major users, to testify on their experience with the Division's services, either positive or negative. Additionally, written comment was solicited from any agency or interested party who wished input. Representatives from the Department of Revenue, Department of Transportation, Department of Social and Rehabilitation Services, the Judicial Department, Department of Health and Environment, the Real Estate Commission, KBI, KPERS, Highway Patrol and Department of Education appeared before the Committee. These individuals generally spoke favorably about DISC services, with a number noting considerable improvement over prior years. Two agency representatives felt that perhaps the DISC staff was spread too thin and one conferee expressed concern about the error rate in data entry, which is handled by the Division of Accounts and Reports. Almost without exception, conferees responded to Committee concerns about the lack of personnel reductions or other savings as a result of data processing by pointing to cost avoidance benefits and the ability to generate better management information. The apparent consensus among user agencies was that computerization had enabled them to handle an increased workload without hiring additional staff and provided the additional benefit of generating reports and information that would have been impossible or too costly to gather manually.

Other conferees who appeared included Dr. Lynn Muchmore and Dwayne Sackman, Division of the Budget, and Don Heiman of Legislative Post Audit. The Budget Division officials discussed the manner in which that Division's staff use the recommendations of DISC in their analysis of agency data processing budget requests. Both noted that the ultimate

decision as to whether a proposed data processing application merited the dollar investment rested properly with the Governor and Legislature and that it was not a function of DISC. Mr. Heiman reviewed for the Committee the distinctions between the respective data processing audit functions of his organization and DISC. He also informed Committee members that DISC is scheduled for a sunset audit in the coming year.

The Committee invited Dr. Richard Mann of the University of Kansas to appear and discuss his previous study. Dr. Mann reviewed some of his findings and noted that it appeared DISC was substantially following his earlier recommendations. He explained in response to concerns expressed by Committee members, that there were a number of approaches that the Legislature could take to evaluation of data processing requests and to control of expenditures. He felt that development of a multi-year plan was important, that DISC evaluations should be provided in nontechnical terms and that agencies should be required to justify their requests in some detail. Dr. Mann noted that, although an outside consultant might be needed to evaluate the technical aspects of DISC's operations, he did not believe that technical expertise was required to make decisions on the merits of a proposal to automate a given system. He also told the Committee that, while personnel reductions could result from automation, that was frequently not the case nor was it always the intention.

Presentations by DISC. Jerry Magnuson, Director of DISC, met several times with the Committee outlining the current organization and operations of the Division as well as reviewing the progress it has made since its inception. He pointed out that a major priority of the Legislature when DISC

was created was the conversion of Department of Revenue programs from an obsolete RCA computer to the IBM 3033 and that this project was substantially completed. He also discussed some of the Division's other large projects and gave a demonstration of the Kansas Integrated Personnel/Payroll System, a major effort of the Division of Personnel Services and the Division of Accounts and Reports.

Mr. Magnuson, and subsequently his successor as Acting Director, Mr. Bill Belleville, reviewed in detail the work that DISC has done to improve the EDP (electronic data processing) planning and budgeting process of both DISC and the user agencies. Prior to the 1982 Session agencies were asked to submit separate EDP plans and budgets to DISC. Since DISC is financed primarily by charges to the user agencies, the Division's budget is driven by the aggregate of agency EDP budgets. Conversely, the planned use of the central computer by state agencies affects the rates that DISC establishes. Coordination of agency plans and DISC operations is, therefore, essential if budgets are to be prepared with any accuracy. Furthermore, early submission of agency plans to DISC is necessary in order for DISC to make timely recommendations to the Budget Division. As Mr. Magnuson explained, the individual agency plans also form the basis for the comprehensive statewide plan that DISC is required to prepare.

Mr. Magnuson, and later Mr. Belleville, acknowledged that a number of problems have been experienced in the development of a workable planning and budgeting process. Foremost among these problems has been getting detailed plans from agencies early enough in the budget process to accommodate DISC planning and evaluation responsibilities.

The Committee learned that DISC's approach to evaluating an agency's request for data processing is primarily technical. In other words, DISC will evaluate whether the way an agency plans to automate is the most cost-effective approach, whether automation of a particular program is technically feasible, and whether the costs attached to such automation are accurate estimates. DISC does not judge whether the cost of automation is worth the benefits that the agency expects to derive. However, DISC does require agencies to submit justifications of their requests and plans.

Mr. Magnuson shared with the Committee an outline of how DISC plans to implement the EDP planning and budget process in the future, including a requirement that agencies submit their plans to DISC in May of each year. From the individual plans, DISC will compile a comprehensive plan, which will be updated annually and to which agencies will be expected to conform.

Committee Findings and Recommendations

Committee discussion throughout the study focused particularly on two concerns. First, the technical nature of data processing made it difficult for legislators to evaluate agency budget requests for data processing. Secondly, information has not been made available to the Legislature that justifies the cost of data processing in terms of the benefits to be derived. Related problems included the fact that agencies themselves were often unable to explain why a certain dollar amount had been requested for EDP, that EDP programs were sometimes not included in an agency budget one year, but would surface the next year, after development had begun, at significant cost.

The Committee discussed several alternatives, including establishment of a standing Joint Committee to review data processing budgets and retaining a consultant to evaluate DISC operations.

The Committee concludes, however, that such recommendations at this time are premature. The Committee recognizes that DISC has had a relatively short time to gear up and implement the requirements of the 1980 legislation. There is general agreement that DISC has made visible progress in recent months and that, conceptually, the planning mechanism that DISC proposes holds the potential for resolving many previous concerns.

The Committee specifically recommends that the Legislature closely monitor the implementation of the planning process, with particular attention to the requirement that agencies submit data processing plans prior to the formal budget submission in September. The Committee requests that these submissions be made available to the Kansas Legislative Research Department and emphasizes the importance of that availability early enough to give DISC and the Budget Division, as well as legislative staff, the opportunity to analyze them properly. The Committee further recommends that the Ways and Means Committees of both houses be made aware of the information that was submitted.

Respectfully submitted,

_____

Rep. Robert H. Miller,
Chairperson
Special Committee on Data Processing

Sen. Merrill Werts,
Vice-Chairperson
Sen. Paul Feleciano

Rep. Jack Shriver
Rep. Bob Arbuthnot

Attachment 2