

The Christmas Of The Computer

COMPUTE!

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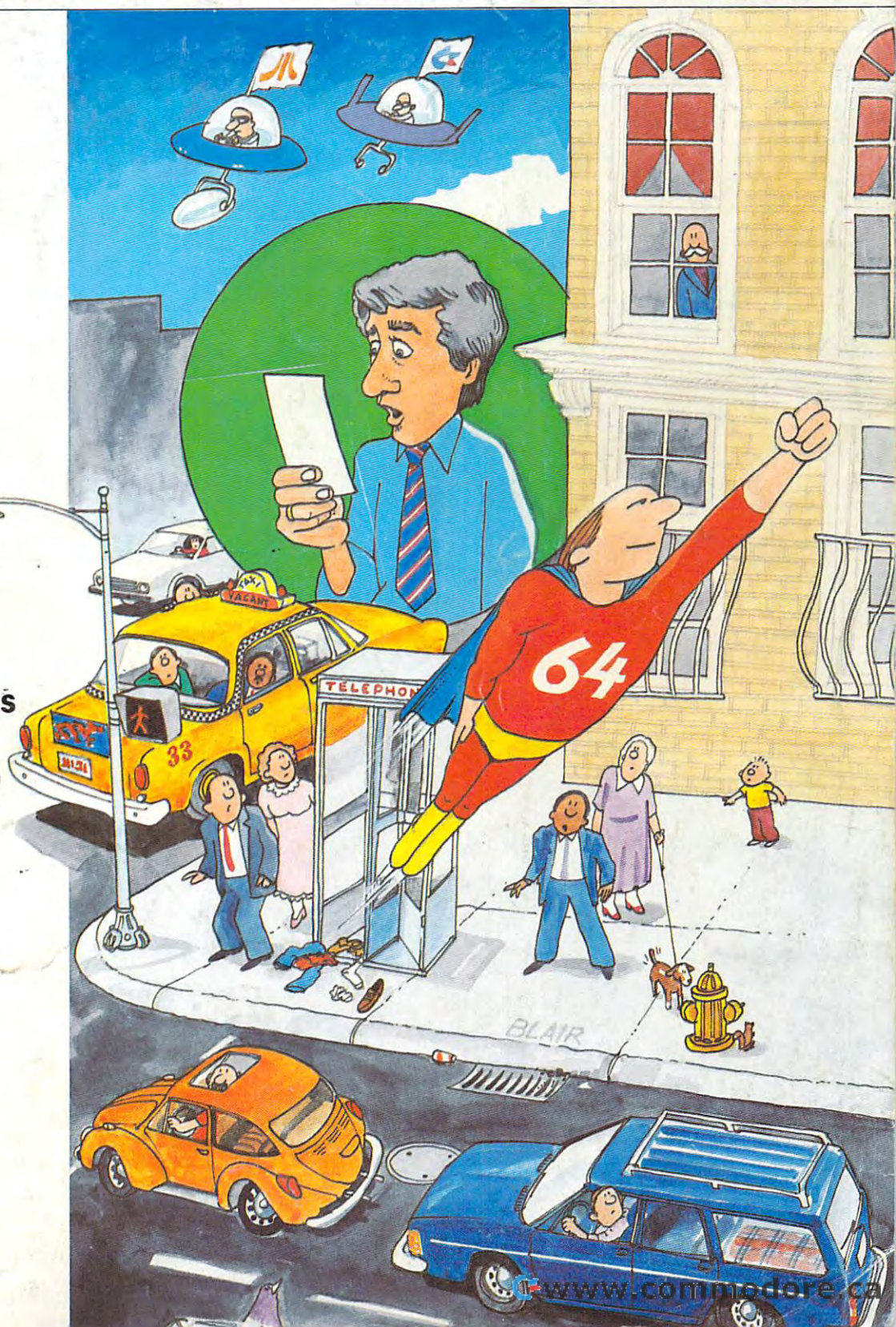
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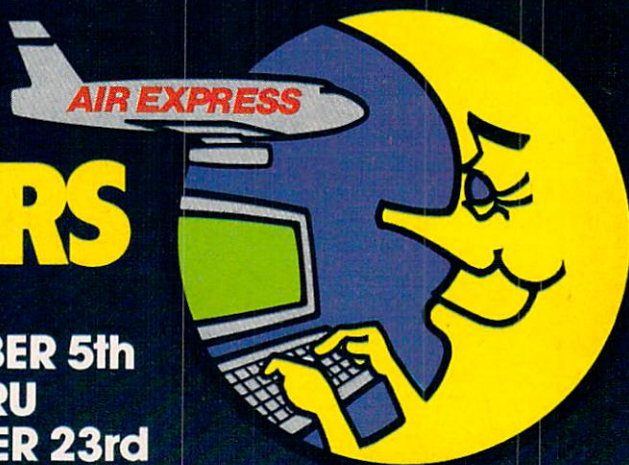
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NOTE: See page 350
before typing in
programs.

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EDITOR'S NOTES

If all the rumors are correct, by the time you're reading this, IBM will have announced and introduced "PC Junior," the new personal and home computer also known as "Peanut." If you own a PC, a "Junior," or a Coleco Adam system, we're interested in articles. Address them to Submissions Editor, New Computers, COMPUTE!, P.O. Box 5406, Greensboro, NC 27403.

While this Christmas was destined to be "the Christmas of the computer," delays in shipments for Coleco and Atari, and the impact of expectations regarding the new IBM entry, have made it anything but a happy season for investors in the personal computer stocks. Texas Instruments, Commodore, Warner Communications (Atari), and Coleco have been seesawing back and forth with every delay, anticipated or actual. Warner stoutly denies any falling off in their intentions toward the personal computer marketplace; Coleco vows to ship hundreds of thousands of systems by Christmas; and Commodore head Jack Tremiel is quoted in the *Wall Street Journal*, in response to concerns about IBM's pending entry, as suggesting that there are far more people with \$200 than \$700 for a computer. We should doubtless look forward to an interesting spring.

From COMPUTE!'s perspective, we're seeing thousands of new computers sold every week, and plan to continue providing you the same level and quality of applications and support. We *don't* expect the major players to change anytime soon.

We noted with regret the filing of bankruptcy by the Osborne Computer Corporation, and with special regret some of the mudslinging that occurred after the fact. Among the available scenarios is the possibility that Mr. Jaunich, president of the company, arrived too late to stem the flood of problems that predated him. Our regrets to the laid-off employees, and best wishes for a sound recovery.

If you're in the marketplace for a unique Christmas present, Kathy Yakal presents a random sampling in the sidebar to her feature "The Christmas Of The Computer?" A chocolate diskette, perhaps?

Random Bits:

This is the largest issue ever of COMPUTE! and all of our previous records are being broken: largest number of pages, largest number of four-color advertising pages, largest number of advertising pages, *and* largest number of editorial pages.

Our compliments to Senior Editor Richard Mansfield. His

book, *Machine Language for Beginners*, was recently ranked among the top five best-selling computer books in the country.

COMPUTE! is moving. Each year, in the five-year-long history of our company, we've moved into new quarters that we were convinced would last us several years. Our fifth move is coming up in late January, and this time we're *really* going to move into a location that will hold us for several years. We've not only left room for next year's new staff members, but have planned expansion space for future years' growth. None of the old-timers around here are quite sure what it will be like to stay in one spot for more than twelve months, but we're certainly looking forward to it. Next month we'll let you know the address of our new location. The post office box and telephone numbers will remain the same.

The staff of COMPUTE! Publications, Inc., wishes you all a happy holiday season and a safe and rewarding new year.



Editor In Chief



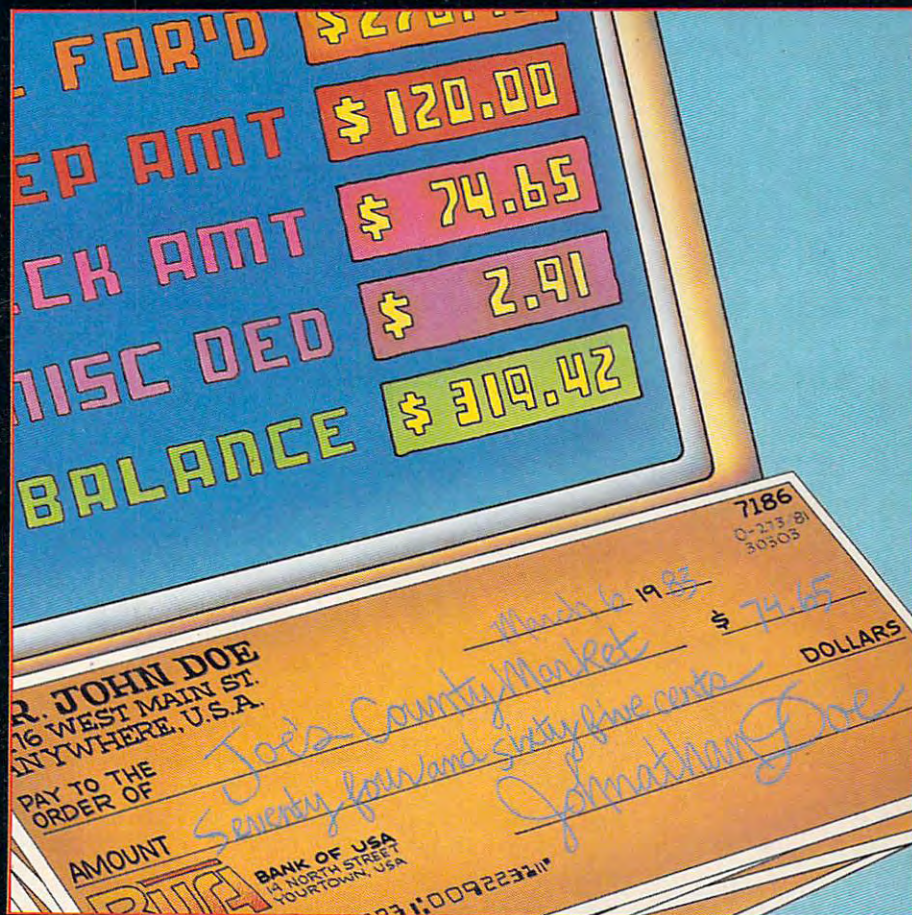
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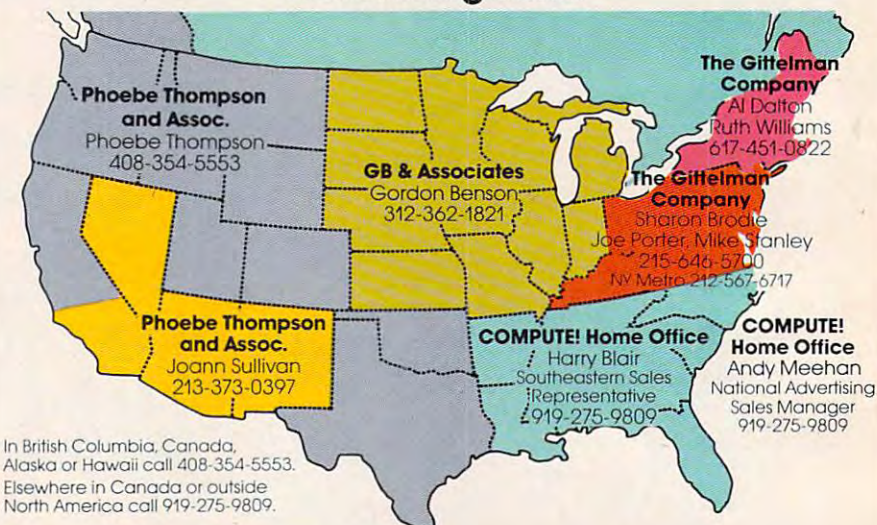
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READERS' FEEDBACK

The Editors and Readers of COMPUTE!

Chill Factor For Disks And Tapes

I have often read that diskettes must not be exposed to temperatures below 50 degrees. Does this mean that people who live in cold climates must not order disks or programs by mail in the winter? Will the disk be ruined or must it be given time to warm up again? Do cassettes suffer the same limitations?

Helen Weidner

Severely cold weather should not limit your mail order purchases of diskettes (blank or preprogrammed). The storage medium will keep some of the cold away from the disk. However, the safest procedure is to climatize the disk for at least 24 hours before inserting it in the drive. Extreme cold and heat cause contraction and expansion of the plastic disk, which alter the disk track locations.

Also, extreme humidity can damage a disk. A safe guideline (suggested by 3M, for disk operation) is a temperature range of 50 to 125° Fahrenheit and 8 to 80% humidity. Cassette tapes are less sensitive than disks to temperature and humidity extremes, but climatizing them, too, is a good idea.

Where Are The Commodore 1541s?

We have received many letters from readers asking about the disappearance of Commodore 1541 Disk Drives from the market. A Commodore representative told us that the demand was greater than the supply. Apparently, Commodore did not anticipate that so many 64 owners would purchase 1541s rather than Datassettes.

However, several Commodore dealers informed us that the return rate of 1541s had recently been high, suggesting a technical flaw. Possibly Commodore is attempting to locate and correct the problem and then reissue the 1541s. Commodore has said that the drives would be back on the market soon.

Reading Commodore 1541 Disk Drive Memory

I own a 1541 Disk Drive. I wrote a small program so I could read the disk ROM and display the contents in hex format. Starting at location 00, I can get information for about 100 bytes. Then I get a repeating pattern: 0D,30,30,2C,20,4F,4B,2C,

30,30,2C,30,30,0D. Other than location 00, no matter where I start, I get this same pattern.

Can you help me?

Larry Rieth

Jim Butterfield replies:

It's not hard to view disk ROM, once you get the commands right. The false pattern you were getting, by the way, is the 00,OK, 00,00 status message in ASCII. I find it easiest to call up the bytes one at a time.

The program here should do the job. There are some "cursor cosmetics" built in to aid with convenience of use; these are not essential, so you may want to eliminate them. Everything is in hexadecimal, since that's the most convenient way to read machine language. Again, change this if you wish.

I don't have any 1541 memory maps. I have been hanging back since Commodore has been known to change architecture from time to time. If you want to view disk ROM, start at \$C000 and work up from there.

```
190 PRINT "INPUT MEMORY ADDRESS"
200 PRINT "IN HEXADECIMAL:":OPEN1,8,15
220 PRINT "{2 SPACES} {4 RIGHT} {31 SPACES}"
    {UP}"
230 Z$="XXXX":INPUT Z$
240 PRINT "{UP}";:IF LEN(Z$)<>4 THEN GOTO
    {SPACE}220
250 T=0:FOR J=1 TO 4:Y=ASC(MID$(Z$,J))
260 Y=Y+48*(Y<58)+55*(Y>64)
280 IF Y<0 OR Y>15 THEN GOTO 470
290 T=T*16+Y:NEXT J:K=0:PRINT "{6 RIGHT}";
300 V=INT(T/256):U=T-V*256
360 PRINT#1,"M-R";CHR$(U);CHR$(V)
370 GET#1,X$:IF X$="" THEN X$=CHR$(0)
380 PRINT " ";X=ASC(X$)/16
390 FOR J=1 TO 2:GOSUB 500:NEXT J
420 T=T+1:K=K+1:IF K<8 GOTO 300
440 X=T/4096
450 PRINT:PRINT "{2 SPACES}";:FOR J=1 TO 4:
    GOSUB 500:NEXT J:PRINT "{UP}":GOTO 220
470 CLOSE 1:END
500 X%=X:(X-X%)*16:IF X%>9 THEN X%=X%+7
510 PRINT CHR$(X%+48);:RETURN
```

Atari XL Features, Disk Density, And Octave Expansion

Upon reading your review of the Summer Consumer Electronics Show (August 1983), I thought of the following questions about Atari's computers:

1. Do the XL series require a plug-in BASIC car-



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tridge, or is BASIC built-in?

2. What is the physical difference between a single-density disk and a double-density disk?
3. How can a single-density disk be converted to double-density?
4. Are there any software or hardware packages available to increase the amount of music octaves the Atari computers can generate?
5. How does the direct-connect modem included in the 1400XL and 1450XLD computers work (as far as connection goes)?

Andrew Matsuoka

1. The 1200XL requires the optional BASIC cartridge, but the new 600XL, 800XL, 1400XL, and 1450XLD all have BASIC built-in.

2. The term double density can be loosely applied. It can refer to more tracks per inch (TPI), larger sector size (128 bytes versus 256), or additional tracks and sectors. In an effort to provide compatibility, Atari does not truly use double density. In effect, they added extra sectors, increasing disk storage from 90K to 127K.

3. The 1050 drive can read single-density disks, so it is a simple matter of copying a file from a single-density disk to a formatted double-density disk.

4. The four Atari sound generators have an eight-bit resolution, so there are only 256 possible notes, or five and a half octaves. It is possible to chain two voices together to create one voice with 16-bit resolution, permitting a nine-octave range. You can have two 16-bit voices, or one 16-bit voice and two eight-bit voices. The Advanced Music System, available from APX (Atari Program Exchange) allows 8-bit sound and can be synchronized with an external cassette recorder to let you create recorded music with more than four voices. (You play one tape through the speaker while the Atari plays music. The composite sound is then recorded on a second tape recorder.) Take a look at "16-Bit Atari Music" in the March 1983 issue of COMPUTE!.

5. Direct-connect modems attach to telephones with modular jacks, either through the handset or the base. If you cannot simply unplug the cords from your telephone, you'll need to contact your telephone company. Adapters are also available from stores like Radio Shack.

Dual Joystick Control On The TI-99/4A

I built the adapter suggested by Gary Cook ("How To Build Your Own TI-99/4A Joystick Adapter," COMPUTE!, August 1983), and it worked well as long as I only used one joystick. However, when I tried two joysticks in a program, I discovered that the joysticks would lock each other up when moved in the same direction until one of the joysticks was disabled.

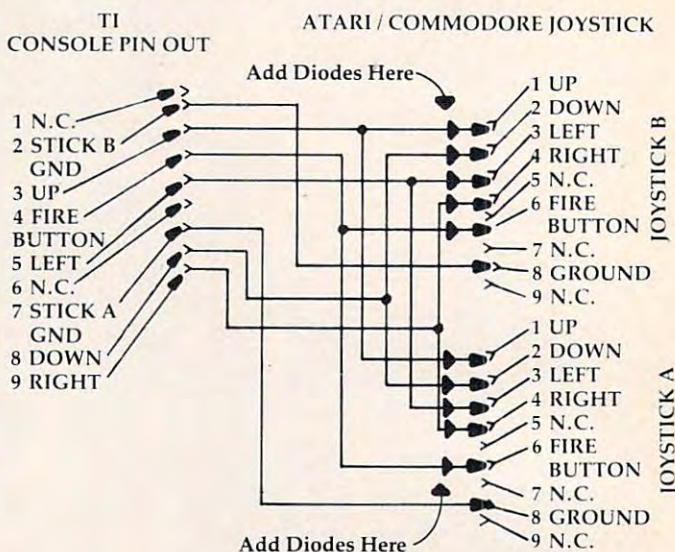
To correct this, I added diodes (1N914 or equivalent) at each connection except ground.

Diodes should be added in the lines going to both joysticks, and they should have the cathode (banded end) toward the joystick switches. After this modification, simultaneous joystick movement was fine.

Enclosed is a modified drawing of the adapter box.

Jim Mallonee

We tested this and it works well. This alteration is unnecessary for those who plan to use only one joystick.



POKE Dangers

I'm concerned about the admonitions from the Commodore 64 Programmer's Reference Guide. On page 215: "...without an assembler you will have to POKE the machine language program into memory which is totally inadvisable." Even more ominous is the note on page 417: "Commodore Semiconductor Group cannot assume liability for the use of undefined opcodes."

What's the worst thing a wrong number could do? Erase magnetic files? System crash? Could an undefined opcode cause permanent hardware damage?

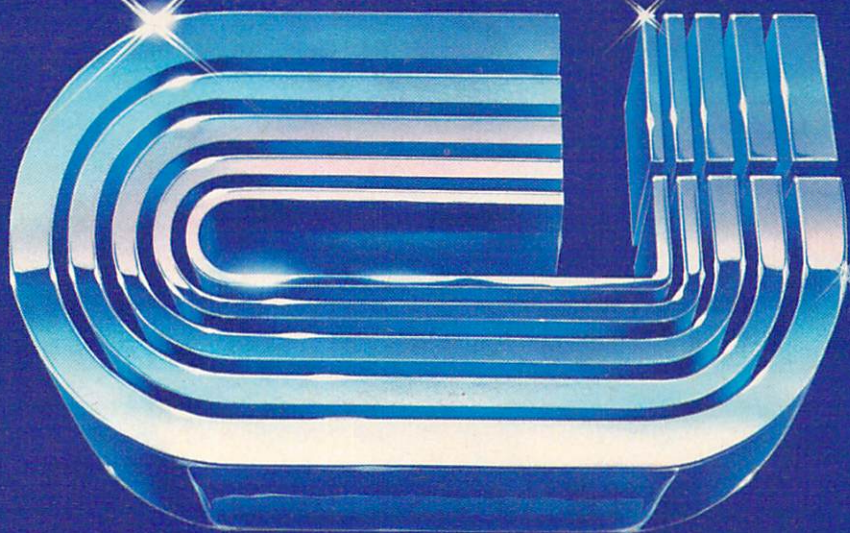
David Paulsen

Feel free to POKE around anywhere in your computer without worrying about causing trouble. The two warnings that you quote refer to two different things.

It would be "inadvisable" to POKE a machine language program into the computer without using an assembler because it would prove extraordinarily frustrating. Creating a machine language program by POKEing in the codes wouldn't disturb your computer, but it would take so long and would be so error prone that it might well drive you up the wall.

The other issue is rather technical. The 6502 chip, the little "brain" within Commodore and other computers, has a theoretical capacity to understand 256 different commands (opcodes) in machine language.

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However, the designers only created 56 commands which, even when multiplied by their several addressing modes, still don't use up all 256 possible opcodes. However, some of these unassigned numbers will nevertheless have effects if you use them in your ML programming. For a complete description of these hidden commands, see "Extra Instructions," an article in the October 1983 issue of COMPUTE!.

How Much Memory For An Atari Disk?

I'm very seriously thinking about purchasing a disk drive for my Atari 400. I want to know if 32K is enough memory to have a disk drive and run DOS, and still program. Is the new Atari disk drive able to plug right into your computer?

Adam Bullock

As a matter of fact, it's possible to run a disk drive with a 16K Atari. DOS (without the menu) uses under 6K. For practical purposes, though, you should have at least 24K in order to run most programs.

The new 1050 double-density (256K) drive attaches to the standard serial port like any other Atari peripheral.

Commodore 64 Video Revisited

An Update From Jim Butterfield

The programs given in "Commodore 64 Video - A Guided Tour," Parts 6 and 7 (July and August, 1983), work fine on my machine, and will work well on many earlier model Commodore 64 machines. On the newer machines, there's a problem that can be solved by adding the extra line:

90 POKE 53265,27

Here's the problem: In newer models of the 64, the computer actually does its own raster interrupt at time of power-up. This is done for a peculiar reason: The computer wants to know if it's a European model or not.

As TV technicians will tell you, North American television has 525 scan lines, whereas the European PAL system has well over 600. The computer's internal clock also runs at a slightly different speed. But the ROM is the same in both systems.

Now, the ROM needs to know whether it's working within a European or North American system, since it will want to time certain events (realtime clock, communications speeds, cassette tape) at a constant speed regardless of its internal clock rate. So at time of power-up, it commands: "Tell me when I reach line 622 of the screen." (The actual value it uses is 311, since scan lines are "twinned.")

Some time later, the computer asks, "Has line 622 showed up?" If the answer is yes, the computer knows it must be on a European system. If the answer is no, the computer decides that this must be the North Amer-

ican system, which doesn't have 622 lines on the screen. Now the computer can fix up its timing tables.

In the meantime, it has left the raster register with a high number in place. To make the split programs in Parts 6 and 7 work, we must take this high number out. Address 53266 handles most of the raster register, and it's all we need to do the job specified. But first we must clean out that high bit in address 53265 with a POKE value of 27.

If this seems rather complex, don't worry about it. Just add the line 90 POKE 53265,27 to all programs, and everything should behave correctly.

A Sharper Picture For The TI-99

The normal screen color of the TI-99/4A — assuming you have a color TV — is green while the program is running and blue when it is not. If you have a black-and-white TV, you can get a sharper picture by asking for a gray background with a statement like

10 CALL SCREEN(15)

at the beginning of the program. This disables the color-generating circuit of the TI-99 and removes the pattern of vertical lines often seen on a black-and-white TV that is fine-tuned for maximum sharpness. It also increases the sharpness of the characters. The change remains in effect as long as the program is running.

The same idea can be applied to other machines that allow you to control the background color.

Michael A. Covington

Atari 800 Software For The 1400XL/1450XLD

I was thinking of trading my Atari 800 for the 1400XL or the 1450XLD, but would all the software for the 800 work in the 1400XL and/or in the 1450XLD? Or, would it be easier to just buy the CP/M module and the Atari expansion box for my 800?

I am looking for a disk drive for my Atari 800. I have seen the Atari 810 and the 1050, the RANA 1000, and the Percom disk drives. Which one would be the least expensive and still be a good choice?


Also, I would like to know if the Commodore 1701 Video Monitor would hook up to my Atari 800 through the monitor jack.






Shane McWilliams


Almost all BASIC programs and the majority of other programs will run just fine on the new XL computers. The Atari Operating System in ROM was designed so that future upgrades would be transparent to previous software, as long as that software followed certain rules. Some programs shortcut these rules, so they end up ac-



Sometimes, a word is worth a thousand pictures.




Once there was a  time,



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
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cessing routines that have moved elsewhere in the new XL computers. Atari has published a list of Atari programs that do not work properly on the new machines.

If you are only interested in CP/M, you do not need an XL computer (the CP/M module attaches via the serial port), but many future expansion cards will not work with non-XL Ataris (or the 1200XL).

All the third-party disk drive manufacturers offer certain features over the 810 disk drive, most noticeably price. The new so-called double-density Atari 1050 drive reduces the price gap, but some third-party drives offer twice the 90K storage of the 810, along with dual drives, LED consoles, and printer ports. As with computers, the decision is up to you.

Look at the drives critically and decide what features you want and need. You should make sure the drive offers total compatibility with Atari drives, so you can boot, read, and write disks prepared on an 810, such as commercial programs or a friend's disk. Most third-party drives deviate slightly from the 810 drives, but so do individual 810's from each other. Borrow several copies of disks prepared with an 810 and try them out on the unit in question. Warranties and service options are also crucial with this type of equipment. You cannot count on your authorized Atari service center to repair a third-party drive.

And, yes, you can use the Commodore 1701 Video Monitor with your Atari. As a matter of fact, you can even use the proprietary video enhancement circuit via the rear connections of the monitor. Just buy or wire a cable to correspond to the RCA jacks and the Atari monitor pinout (the Commodore 64 and the Atari monitor jacks are almost identical). You can also connect your Atari and 1701 with the cable that comes with the monitor. The monitor can also be used via the front connections with any computer that has composite video output, such as the TI-99/4A.

Modifying The Kernal On The Commodore 64

I have been trying to run the Kernal from RAM – the same RAM underneath the Kernal ROM from E000 to FFFF. I'm trying to make some modifications to the Kernal, but as a first step it would be best to move the unmodified Kernal from RAM. I've come close to being successful, but just when I think it's ready to work, the computer crashes. Do you have a solution?

Charles Kluepfel

A strange thing happens when you try to flip out the Kernal – the BASIC ROM goes, too. It might be helpful to read "Commodore 64 Architecture" (COMPUTE!, January 1983).

If you want to rewrite the Kernal routines, you must also copy BASIC into RAM. In BASIC, the whole procedure would be:

```
FOR J=40960 TO 49151:POKE J,PEEK(J):NEXT
{SPACE}J (COPY BASIC)
FOR J=57344 TO 65535:POKE J,PEEK(J):NEXT
{SPACE}J (COPY KERNAL)
POKE 1,53 (SWITCH OUT BASIC AND KERNAL RO
MS)
```

This is the piece you're missing. Now it will work.

Avoiding TI INT

A little known fact about TI computers is that they will accept nonintegers for arguments such as array subscripts and CALL HCHAR and CALL VCHAR arguments. If a floating point value is used, the computer will round off to the nearest integer. For example, A (1.6) is the same as A (2), and A(5.25) is the same as A (5).

This is useful when you want to compute the proper element of an array with floating point values. For example, say you have a sprite with coordinates SPRITEX and SPRITEY, and you want to see what's underneath it on the screen. You can then use the following command to get the value:

```
CALL GCHAR(SPRITEY/8+.5,SPRITEX/8+.5,var)
```

Why is this important? Taking the INT of those values uses a lot of valuable time, and the INT is absolutely unnecessary. In a graphics program, this can speed things up considerably.

Neil Weinstock

Cassette Auto-Boot For Atari "Roadblock"

If you have a working copy of "Roadblock" (COMPUTE!, July 1983, page 108), make the following changes to create a cassette boot version.

1. Load the *original* listing of Roadblock. This must be a working copy.

2. Change line 10 to:

```
10 OPEN #3,8,128,"C:"FOR I=13804 TO 15010:
READ A:PUT #3,A:NEXT I:CLOSE #3:END
```

3. Delete line 15.

4. Add line 1000 as follows:

```
1000 DATA 0,10,236,53,242,53,169,60,141,2,211,169,
196,133,10,169,57,133,11,96
```

5. LIST or SAVE to tape.

6. Ready the cassette on which you want your boot version, and make a note of the tape counter.

7. Now RUN the modified program (which is still in memory).

8. You will hear two beeps. Press play and record on tape and then any key on your computer and a cassette boot will be created.

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9. Rewind the tape to the count you noted earlier. Turn off your computer and remove the BASIC cartridge. Turn on your Atari while holding down the START button.

10. You will hear one beep. Press play on tape and then any key on your computer and Roadblock will auto-boot.

The cassette boot that you have just created should load and run in approximately 65 seconds. For an even faster cassette boot (45 seconds), use Ed Stewart's program in *COMPUTE!'s Second Book Of Atari*, page 227.

Richard K. Wagner

function. For example, $DEF FND2(V) = V/2$ is a function that divides a number by two. $PRINT FND2(10)$ then would give you a five, and $FND2(3)$ gives 1.5. The variable V , called a dummy variable, defines the relationship of the number you give the function. You can still use V in your program (and you don't have to use V as the dummy argument) as its value won't be changed by a FN statement.

On the Atari, you can just write a subroutine to accomplish the same thing. For example:

```
1000 X=X/2:RETURN
```

Just set X equal to the value in the function's parentheses, $GOSUB 1000$, and assign X appropriately. You can even name the subroutine with $DIV2 = 1000$ and then $GOSUB DIV2$.

DEF FN In Atari BASIC?

The statement $DEF FN$ does not work in Atari BASIC. How can I convert DEF and FN statements to work on my Atari?

Sam Scarfina

First you need to define what an "alien" BASIC's commands do in order to translate them. The purpose of DEF is to define a user-written function. Functions intrinsic to Atari BASIC include COS , INT , SQR , FRE , etc. $DEF FN$ would let you create your own

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The Home Office

Kathy Yakal, Editorial Assistant

Computers have been used in businesses for many years to streamline procedures, promote efficiency—even to do things that were never possible without them. The same thing is beginning to happen in homes with microcomputers: New businesses are being created, and existing home offices can benefit from the variety of information services and software that is available. This article explores some of the ways that the traditional office is changing.

For some people, "going to the office" no longer means a hurried breakfast, a quick glance at the newspaper, and a frenzied trek through rush-hour traffic. There are many options now available for people who would like to be able to do at least some of their work at home with a personal computer.

Working at home is not a new concept. There are many jobs that can be done easily in a home atmosphere: free-lance writing, day care, mailing services, some types of accounting, and so forth.

But the availability of microcomputers, and the proliferation of small business software and telephone linkups to huge banks of current news and other information, have made it possible to locate many offices wherever the worker wants them.

You don't need an expensive, multifeatured business computer to run a business from your home. It's not necessary to have a technical background. And you won't find a catalog limiting you to a certain selection of jobs.

"The limit to what you can do with a personal computer to start a business is human imagination," says Hank Scheinberg, an executive vice president for Continental Software in Los Angeles. "I don't think it's necessary to have a higher-level machine to do it, either. The lower-end machines will continue to get easier to use."

Selling Words

According to many software distributors, business software is starting to outsell games. Accounting and mailing list programs are very popular, but perhaps the best sellers are word processing software.

It appears that many of those people who are purchasing word processors are using them for business purposes. "I would say that that's the



Sue Click, of Cardio-Trace of Indiana, demonstrates how a person's heartbeat can be transmitted from a pacemaker to an electrocardiogram machine through a modem.

most common use among my readers," says J. Norman Goode, publisher of *Micro Moonlighter Newsletter*. "And it's not just the general concept of word processing. There are many variations that people don't often think of, like supplying vendors with reader service information."

Goode's newsletter is geared toward people who want to use their microcomputers to earn some portion of their income. "I would say that the majority of our readers are moonlighters, people who need a second income or who want to set their spouses up in some sort of home business," says Goode. "But I occasionally get letters from people who were successful enough to turn their part-time jobs into full-time ones."

The second most popular home business, according to Goode, is the consulting service. "The hottest topic is information brokering," he says. "For a fee, people will do specialized research by accessing on-line data bases, which they then write up as a report for their client."

An Unusual Application

Computers are becoming an important part of even the most personal of services, like health care. Medical procedures and equipment have made great advances by using microprocessors. But some people fear this, thinking that medical attention could become cold and impersonal.

Sherry Pegg and Sue Click, of Indianapolis,



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Indiana, operate a health-related business out of Pegg's home that is convenient and comfortable for patients, and far from impersonal.

Called Cardio-Trace of Indiana, the company was set up eight years ago to provide follow-up care for people who have recently had pacemakers installed. Pegg and Click visit the homes of cardiac patients, get to know them and explain procedures, and give them a small transmitter about the size of a cigarette case. If the patient prefers, he or she may wear the transmitter in a ring or bracelet.

The transmitters, which are designed by the individual pacemaker manufacturer, are actually tiny modems. They differ from the modems commonly used with personal computers in that they send only analog messages and can only transmit, not receive, signals.

When Pegg and Click call, the patient puts the transmitter next to the mouthpiece of the phone; a signal is then sent over the phone lines. That signal translates into a readout on an electrocardiogram machine. Pegg and Click, who have been trained to read those traces, can tell if the patient is experiencing any unusual heart rhythms and if the transmitter is still functioning properly.

Of course, if the readout indicates some serious problem, the patient's physician is called immediately. If not, they send the readout to a cardiologist for analysis, and a written report to the patient's doctor.

The office paperwork is done on an Apple II+ using software modified by Pegg's husband, Terry, who is a biomedical engineer at St. Francis Hospital in Indianapolis. Terry's program allows them to send form letters, maintain detailed patient files, and keep general business files like accounts receivable and tax records.

Keeping Up At Home

A personal computer and a modem give you access to a spate of news and information services. Even if you don't have a home business, these electronic clearinghouses may still provide you with information that will enhance your work, your financial affairs, or your personal life.

Subscriptions are required to access most of these services. Some charge a per-minute fee for on-line time; in many cases, though, you are supplied with a toll-free or local number to avoid running up huge long-distance charges.

CompuServe and The Source are probably the best known, but there are some new and some more specialized teleservices.

• Desk Top Broker

This financial service, which has recently come on-line, allows you to enter transactions, maintain a portfolio, and see current stock prices on your home computer 24 hours a day, 7 days a week.

"For the first time, individual investors can

service their own accounts as fast as any broker. The Desk Top Broker provides unprecedented independence and fiscal agility, giving the little guy an edge in the market," says C. Derek Anderson, president of the brokerage firm C.D. Anderson & Co. "It marks a new era in personal investing."

• RCA Hotline

RCA Global Communications, which has operated a Telex service for a number of years, has recently introduced a system for home computer owners. Called the RCA Hotline, it offers world news, sports, weather, international financial information, and even things like book, movie, and record reviews.

Alan Garratt, administrator for public affairs at RCA, sees a number of business applications for Hotline subscribers, especially those involved in worldwide business transactions. "Executives find that they can make good use of it at work or at home," he says. "If you get a great idea at 11:00 at night, you can write it up and send it off, whether or not anyone is in the office."

Free-lance writers who write for overseas publications, communications consultants, and people involved in importing and exporting manufactured goods have also found the service useful, according to Garratt.

"It's not so much that our system makes possible jobs that couldn't be done before," he says. "They can just do it much easier—productivity time is better."

More To Come

These examples are not given to imply that we are moving toward an entire work force that operates from its members' homes. Some types of businesses may always require a staff to work together at one location. But microcomputers, business software, and the instant information and communication made accessible through telecommunications, are generating new options for business sites.

For more information, contact:

Micro Moonlighter Newsletter
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Lewisville, TX 75028

RCA Global Communications (Hotline)
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New York, NY 10004
attn: Alan Garratt
Customer Service: (800)526-3969

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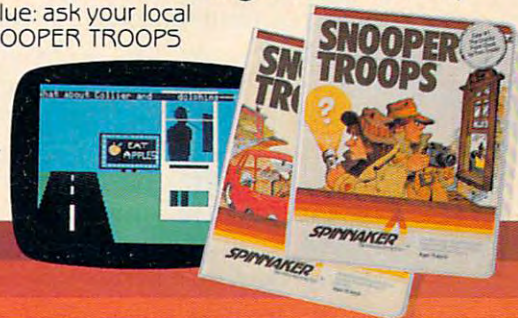
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So if you want to find educational games that are really fun, here's a clue: ask your local retailer for SNOOPER TROOPS computer games.*

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High Tech, High Touch, And 1984

Take a deep breath everybody — 1984 is a month away.

It is obvious to everyone who cares to look that 1984 is going to be a pretty good year. In fact, it will be nothing like the deeply depressing vision of George Orwell in his novel.

It is interesting to examine why 1984 won't happen the way Orwell said it would. In fact, the reason is pretty simple — at the same time we've been moving into a high-tech world, we've also been growing in our sensitivities as human beings. In the book *Megatrends*, John Naisbitt points out that the growth of the human potential movement has run parallel to the growth of high technology in the marketplace.

This is fortuitous, since we are at one of those points in history where major social change is possible.

For the last several years we have been making a transition from an industrial economy to an information economy. To put it simply, American car production has dropped through the floor while computer and software production has shot through the roof. From a time when most of our countrymen worked in the fields, we have moved to an era where only 3 percent of our work force produces our food, and more than half of us work in the information sector.

Orwell's vision for 1984 predicted the tremendous growth in the number of information workers, but it also depicted this transition causing us to become faceless entities to be manipulated by the government. Reality has been far kinder simply because of our own sensitivities as human beings. Perhaps it is our genetic survival coding that insured that we would not roboticize ourselves.

Perhaps, it was just luck.

For whatever reason, we gave ourselves the chance to retain our humaneness, and we took it.

Do you remember the three big movies in the summer of 1982? Two were high tech (*TRON* and *Star Trek II*), and one was high touch (*E.T.*). You know which one was popular.

Did you see *On Golden Pond* or *La Traviata* — and cry?

I did.

The popularity of films that touch us is one sure sign that we are not about to sacrifice our human spirit on the altar of high technology. But what really delights me about our new age is that the computer — the supreme embodiment of high technology — can and will be seen as a tool to enhance and preserve our creative spirit. The computer can be a tool to bring us together, not pull us apart.

Of all the places where the computer has this power, I think the schools are among the most important. To see just one example of why this is so, consider the use of word processors in the classroom.

One of the greatest forces that stifle creative writing is the labor of recopying a final manuscript. I've seen many third- and fourth-graders learn to hate story writing because of the laborious hand copying involved with the creation of a legible manuscript. A word processor goes a long way towards solving this problem.

Of course, some teachers (failing to realize that we already have) may argue that we shouldn't make our children dependent on high technology. Very few children know how to make a quill pen, or how to make their own inks. In fact, many children have access to very high tech ball-point pens, some of which use tungsten carbide balls (tungsten carbide is very high tech).

The issue of accessibility to word processors will go away as the computer continues to become more commonplace in homes and schools. The

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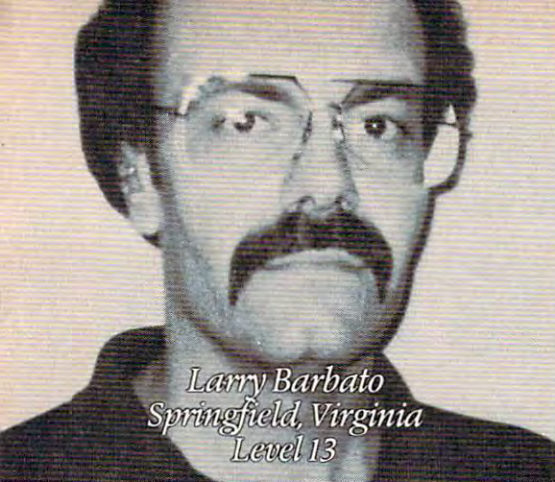
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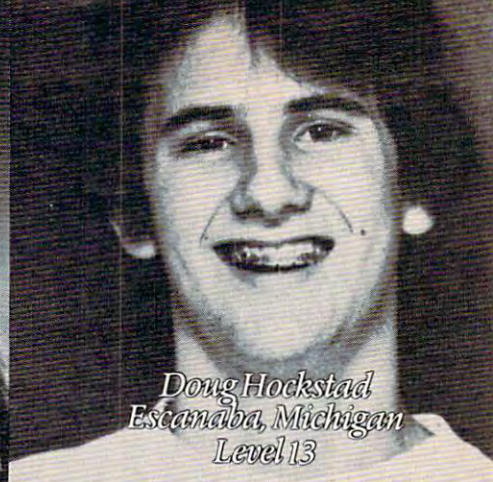
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Larry Barbato
Springfield, Virginia
Level 13



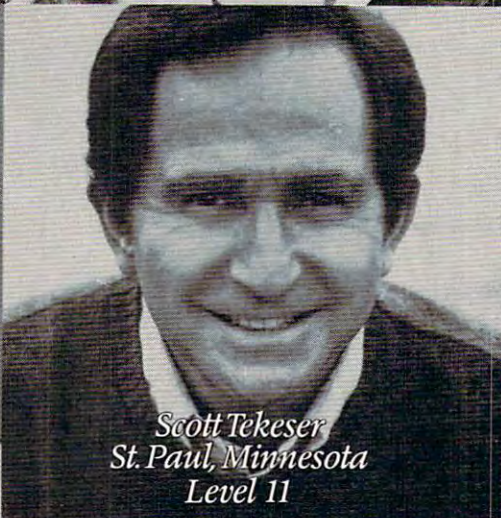
Cindy Horne
Portland, Oregon
Level 12



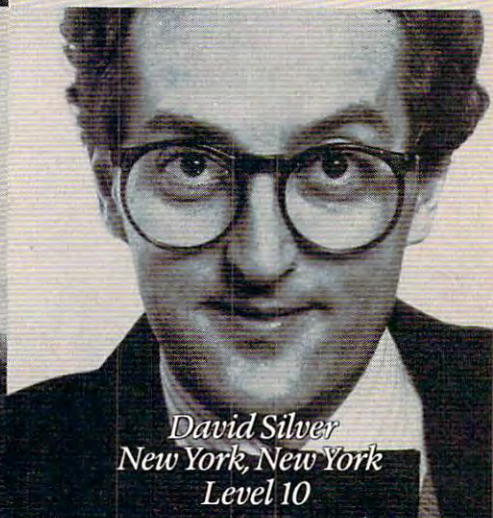
Dong Hockstad
Escanaba, Michigan
Level 13



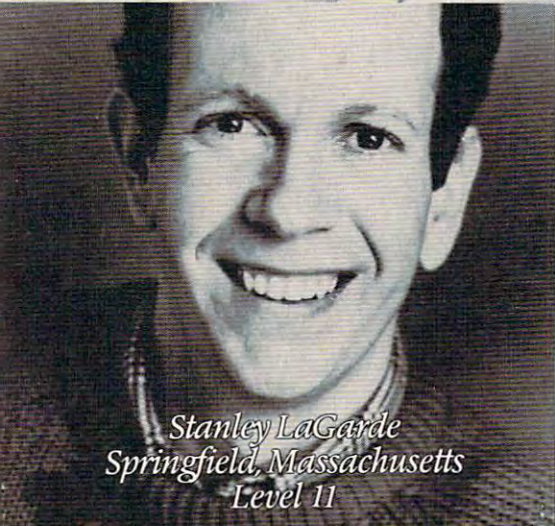
Mark E. Renne
Bozeman, Montana
Level 15



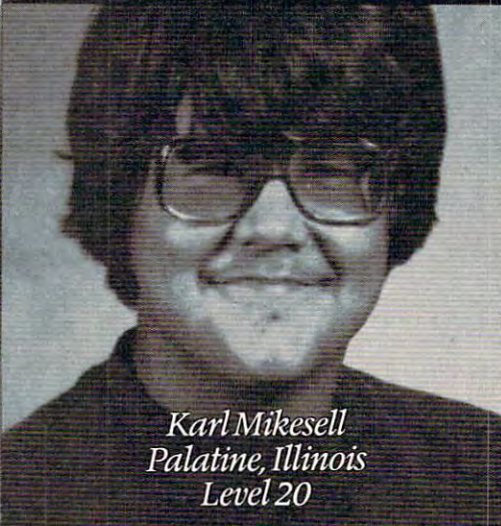
Scott Tekeser
St. Paul, Minnesota
Level 11



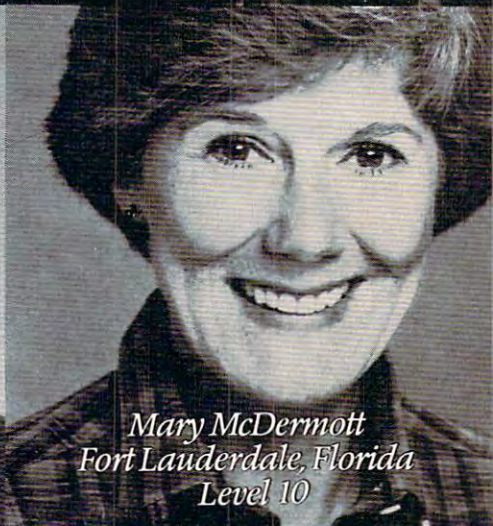
David Silver
New York, New York
Level 10



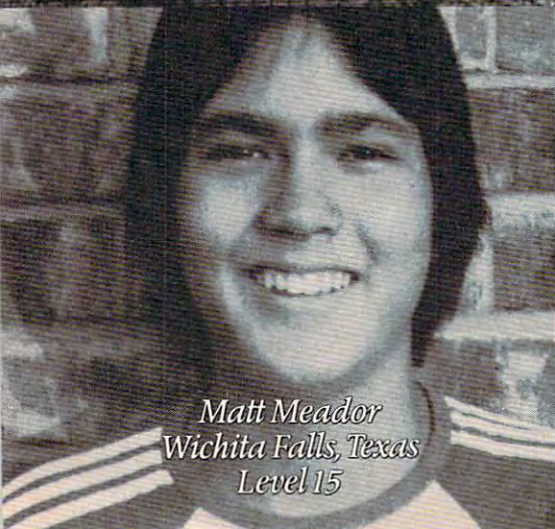
Stanley LaGarde
Springfield, Massachusetts
Level 11



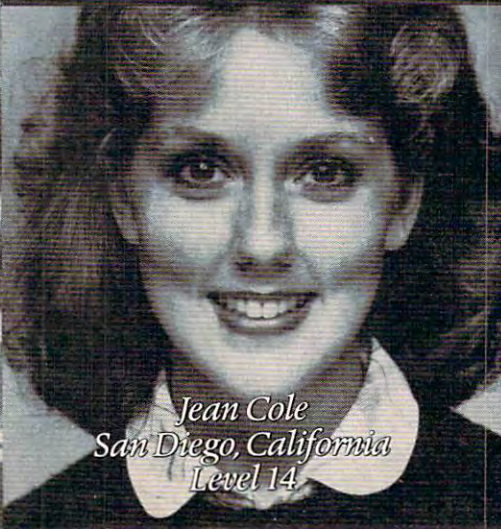
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Palatine, Illinois
Level 20



Mary McDermott
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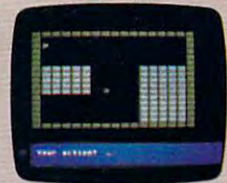
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point is that a word processor can relieve the tedium of recopying a manuscript by hand, and can go a long way towards developing and maintaining a child's creativity.

Other computer-based tools for creative expression (such as graphics tablets and picture generation software) can help maintain creative energy. In fact, the analytical computer can end up being a strong assistant to our creative expression — it can be high tech and high touch at the same time.

And so, with this view, I warmly embrace the forthcoming new year safe in the knowledge that we — through our sensitivities as human beings — have insured that Orwell's vision for 1984 will always remain fictional.

On Piracy And Example Setting

We all know that unauthorized copying and distribution of software is not only against the law, but also that it can drive good authors out of business. We may think that it is the lone programmer working in a back room who is most victimized by this practice, but large companies can be hurt, too.

Faced with dwindling school budgets, some teachers seem almost proud of their abilities to increase their school's software library at no net cost to the school.

If you think this doesn't happen, consider the case of a major educational publisher which understands that teachers want to evaluate software in their own classrooms before buying it. In an effort to be responsive to this reasonable expectation, the publisher made its software available on a 30-day trial basis. At the end of the 30 days, many of these products were returned. On close examination, the publisher found that the documentation binders had been opened and that some of the pages were reinserted in the wrong order — a sign that they had been copied along with the disks.

How could this company have prevented this significant financial loss at the hands of apparently unscrupulous teachers? Some might argue that the disks should have been copy protected, but copy protection works to the detriment of those who feel that they should be able to make legitimate backup copies of their disks. Also, for every software lock, there is a key available for a modest price.

What is needed is a new word in these teachers' vocabulary — ethics.

How prevalent is the problem? It's hard to say, but I have heard many teachers say that the reason they prefer Apple to Atari is because much of Atari's software is distributed on cartridges so you have to buy one for each computer in use. ©

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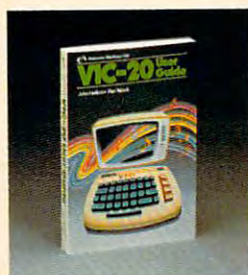
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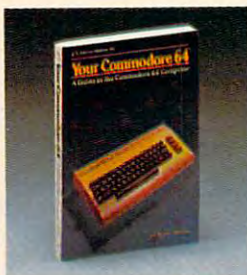
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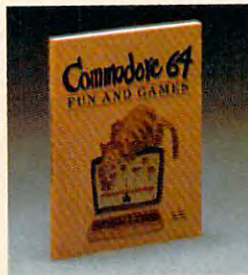
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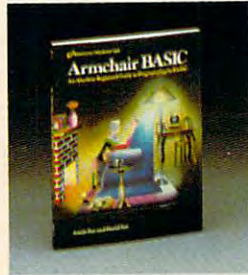
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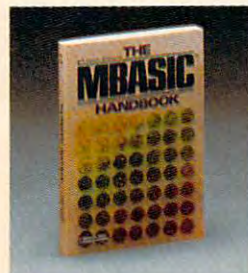
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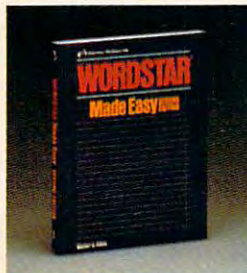
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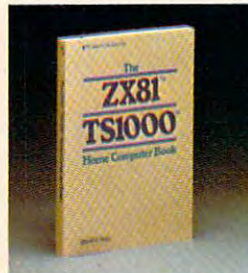
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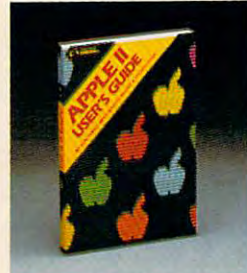
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The Christmas Of The Computer?

Kathy Yakal, Editorial Assistant

In December 1982, Time gave the computer its annual "Man of the Year" award. Now Christmas of 1983 is being touted as the big one for these new machines, due to the market shake-out and radical price cuts over the last 12 months. Here's a review of the events of 1983 and a preview of how this Christmas is shaping up for the home computer industry.

July is the month when many retailers begin making their Christmas plans—products are ordered for the busiest shopping season of the year.

In the summer of 1983, it certainly looked as if this might be the Christmas of the computer. The home computer market was in the midst of a big shake-out, and a few industry leaders had emerged. Competition, improved technology, and lower manufacturing costs had put the home computer well within the budgets of many American consumers. Announcements of some flashy new products and even further price cuts at the summer Consumer Electronics show in Chicago sent retailers and distributors scurrying to place huge orders.

Christmas notwithstanding, the emphasis on computers in education could have also meant big sales for hardware and software manufacturers in the back-to-school market. But in order for that to happen, hardware should have been in place and in great supply by August. It wasn't. Not one of the major hardware manufacturers seemed to be in a good position at that time to ship its products, due to production delays.

Let's back up a bit and look at what led up to this year's scramble.

Half The American Households

The personal computer industry is, of course, based on supply and demand. According to projections released at Future Computing's Second

Annual Home Computer Market Forum in San Francisco, the viable hardware suppliers right now in the low end of the market seem to be Commodore, Atari, Texas Instruments, Timex, and Radio Shack. Future Computing (FC) reports that estimated monthly shipments by these companies are: Commodore, 160,000; TI, 100,000; Atari, 65,000; and Radio Shack, 35,000.

End users create the demand. Many studies have been done on just how high that demand is. Roughly, 1 out of every 20 households owns a computer now, but 3 out of 20 want to buy within the next year. By the end of the 1980s, more than half the American households are expected to have one, according to FC's study.

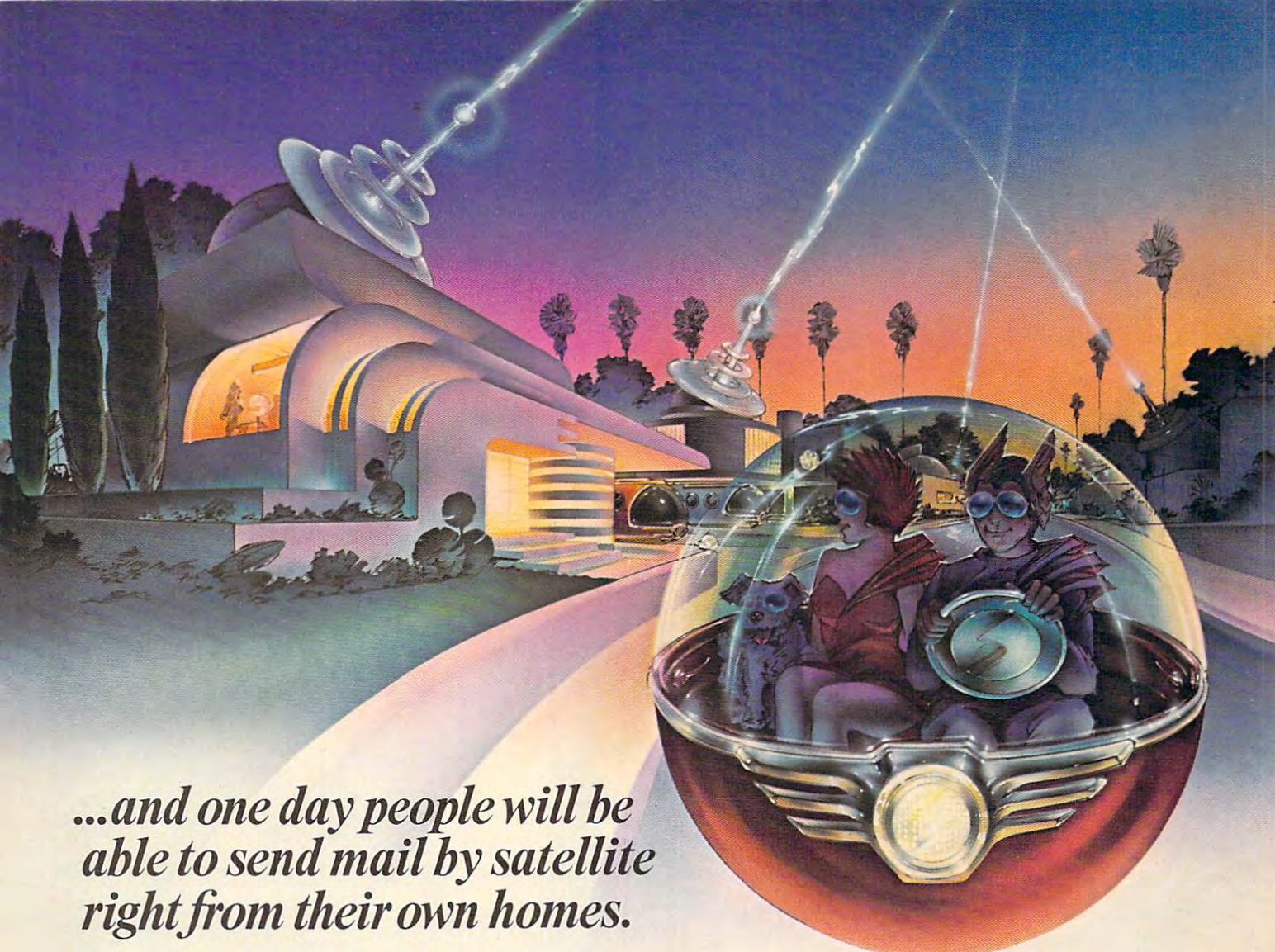
There are lots of reasons why people want to buy computers. Keeping up with the status quo. The fear that if their children don't have a computer at home, they will be left behind in school. That eternal desire to get organized once and for all. And, of course, videogames.

How people choose which computer to buy has also been the subject of much study. Some rely on the recommendations of salespeople in computer stores, but that has become increasingly difficult. Computers often appear on the shelves of mass retailers and discount houses where employees may not know a lot about the product. Others depend on the media for their information: computer books, magazines, and television shows. Probably the most common method is advice from friends.

Complicating Things

There is a third aspect which complicates the issues of supply and demand: software.

Third-party software publishers often do not want to start developing and marketing software for a computer until there is a healthy installed base. But this is a software-controlled industry:



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S O F T W A R E

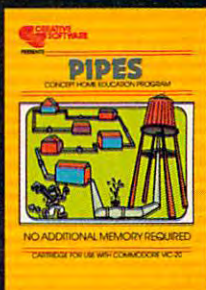
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You've already seen the beginnings of it. T-shirts and bumper stickers with clever computer sayings on them. People's faces digitized and put on buttons. Little foam bats to "beat" your computer. High-tech whimsy.

Several companies have introduced products in this lighter vein that you may want to consider for gifts this year.

The Computer Tie

Designed to interface your wardrobe with your computer, these ties are woven in a navy blue silk and polyester blend with the words BIT/BYTE/FLOPPY/HARD/RAM/ROM/MICRO/MINI written in a continuous pattern on them. One size fits all. \$15.95. (Tie-One-On, Inc., P.O. Box 40225, Philadelphia, PA 190106)



Milk Chocolate Diskettes

Sweetware, Inc., which specializes in edible reproductions of high-technology objects, has just introduced what they consider the ultimate high-tech gift: the Milk Chocolate Eat-Only Diskette. The diskettes come in pairs (a half-pound of chocolate) in a gift box.

Company vice president Alan Levu says that the chocolate diskettes make an ideal gift for anyone who uses computers, and even dedicated computer haters will get a chuckle out of them. They're guaranteed

"user-delicious."

Sweetware sells the diskettes by mail order and through department stores and computer retailers. (Sweetware, Inc., 516 Shelburne Rd., S. Burlington, VT 05401)

The bitCard

These software packages/greeting cards are actually graphics and text adventures that relate to a specific holiday or event. The first in a series of bitCards, "A Christmas Adventure," can be customized with references to the recipient, and programmed to deliver a personal holiday greeting to him in whatever words the sender wishes. This message appears as part of an animated graphics scene — the player's reward for completing the adventure. The bitCard draws the player into a fantasy world in which he is a participant.

Available for Apple II+/e, 48K disk; 16K cassette for Atari 400/800, TRS I/III/CC, and Commodore 64. Cassette version also available for 5K VIC-20 and VIC-20 with 8K RAM expansion. \$16.95 all versions. (bitCards, 120 South University Drive, Suite F, Plantation, FL 33317. bitCards is a subsidiary of CHARTSCAN DATA, Inc.)

Computerized Greeting Cards

Another way to personalize your greeting cards by using your computer is available from Compucards. The package consists of Christmas cards and envelopes with continuous tab feed and clean edge perforations that let you write a message on each card, address it, and print it out. The accompanying diskette contains an upgraded version of the public-domain program Tinytext, which has message-merge capabilities and a separate mailing list program. Both programs come with instructions on diskette.

For Atari computer owners (800 with 48K and disk drive). Package of 20 cards and envelopes, \$9.95. Diskette, \$5. (Compucards, P.O. Box 894, Stone Mountain, GA 30086)

Many people do not want to buy a computer until there is a lot of software to support it. It's a vicious circle. Those computer manufacturers that managed to survive the shake-out did so partly by having enough in-house software available to please consumers until third-party packages could be developed.

Pipe Dreams

Let's recap the highlights of 1983.

- Coleco introduced a prototype of a new personal computer called Adam at the summer

Consumer Electronics Show. Slated to retail at under \$600, this system consists of an 80K computer with detachable keyboard, high-speed tape drive, letter quality printer, and built-in software.

- Atari discontinued its 400 and 800 models and shelved the 1200XL. A new line was introduced at the summer CES: the 600XL, 800XL, 1400XL, and 1450XLD. A good number of new peripherals and some corporate restructuring were also expected to help capture a greater percentage of the market share.

- Commodore slashed its hardware and soft-

Baby's First Software.

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While listening to the story, your child is asked to direct the action on screen by moving the joystick.

As the story progresses, your child becomes part of the

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Best of all, the voice track helps children use PDI programs without assistance.

When PDI programs talk, children listen. And learn.

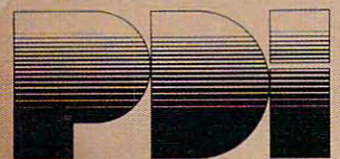
Parents will listen, too. And what they'll hear is the sound of children developing pre-reading skills, including letter recognition and number concepts.

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If all that's not enough to sell you on PDI software, this should. PDI has commissioned a study to measure the effects of our software on pre-school children.

The study, a first of its kind, was supervised by educators specializing in pre-school development. We'll be glad to send you the results, if you'll send us a postcard with your name and address to:

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ware prices and announced several new software packages midyear. Commodore 64s have been selling for under \$200, VIC-20s for under \$100. Peripheral prices have also been reduced dramatically, making Commodore's personal computer packages some of the most attractive in the market.

- Rumors began circulating about a new IBM personal computer called the Peanut, which was expected to retail for under \$600. Industry leaders had predicted that IBM would wait for the home computer market to shake out under them before they introduced a competitively priced product; late 1983 seemed to be that time.

- Mattel Electronics announced a home computer system called the Aquarius and a computer adapter that would turn the Intellivision game machine into a computer. Both machines were to have a number of peripherals.

A Few Snags

All of these new products could have meant a very healthy holiday season for the home computer industry. But manufacturers encountered a few problems between summer announcements and fall shipping schedules.

Coleco's Adam, after a couple of earlier delays that kept it from making its August debut, finally received FCC approval in early October. Production models were expected to be in the stores by mid-October, possibly too late to make a dent in the Christmas market. Some retailers gave up and began cancelling orders in early fall.

Commodore's hardware manufacturers have not been able to keep up with the demand. Disk drives vanished entirely for a few weeks in the fall, reappearing again in early October. Commodore 64s were in short supply and began evidencing some technical problems; some retailers have reported unusually high return rates. Software is plentiful, but so are back orders on hardware. Many retailers still believe there is a good chance that it will be a Commodore Christmas.

Atari still had not brought out any of its new XL line by mid-October. A spokesman said that the 600XL and 800XL should be out in time for Christmas, and that the 1400XL and 1450XLD would probably be ready for shipping in the first quarter of 1984. The add-on keyboard for the 2600 game machine, which is not yet available, is apparently still being considered.

Texas Instruments suffered tremendous financial losses in the first two quarters of 1983. They lowered their prices and embarked on an enormously expensive ad campaign to capture the Christmas market, but they had already lost a lot of the market to Commodore and Atari. Their new strategy is to emphasize the quality and educational value of their machines.

IBM's Peanut failed to appear in time to cap-

ture any great percentage of the potential holiday buyers. Speculation is that the debut had been put off until January.

The Mattel Aquarius Home Computer System is being distributed—minus several of the announced peripherals—in only four markets: Los Angeles, Chicago, Atlanta, and Detroit. The computer adapter, also without some of its add-ons, is still expected to be available around Christmas.

Massive layoffs by Atari, Texas Instruments, and Mattel, as well as all of the no-shows, did nothing to instill public confidence.

Some Good News

Availability of hardware is not the only determining factor in how successful this Christmas will be for the industry.

"People need to remember that we've crossed the bridge over to what is now a software-driven industry," says Dan Schaefer, vice president of marketing for Warehouse One, a Norwood, Massachusetts, software distributor. "People are no longer so enticed by fancy keys on computers—they want to know what they can do with their computers, what kind of software will support it."

Schaefer is not nervous at all about losing business this year because of absent hardware. "There's a tremendous installed base of Ataris, Commodores, TIs, and IBM-PCs," he says. As of October 1, Warehouse One began keeping their main distribution center in Kansas open until midnight on weeknights and all day Saturday, and offering next-day delivery, to help retailers keep up with the Christmas demand.

"Last Christmas was enormously successful for retailers, and that was at a time when the economy was terrible," Schaefer says. "Considering the economy this year, and the demographics of the average computer buyer, this should be an exceptionally good one."

The tardy arrival of this year's new hardware does not particularly surprise Schaefer. "Anytime a new industry emerges, this happens. Products are announced long before they are actually available. The hope is that if the product sounds good enough, people will hold off buying something that already exists until they see what this other company comes up with.

"Some people in this industry have a tendency to dwell with glee on other people's failures," says Schaefer. "This is an extremely dynamic industry: it changes every day. There is still plenty of opportunity for the smart businessman."

So consumers may be a bit disappointed by potentially limited choices this December, but at least one sector of the home computer industry is looking forward to a very successful holiday season—software publishers and distributors. ©

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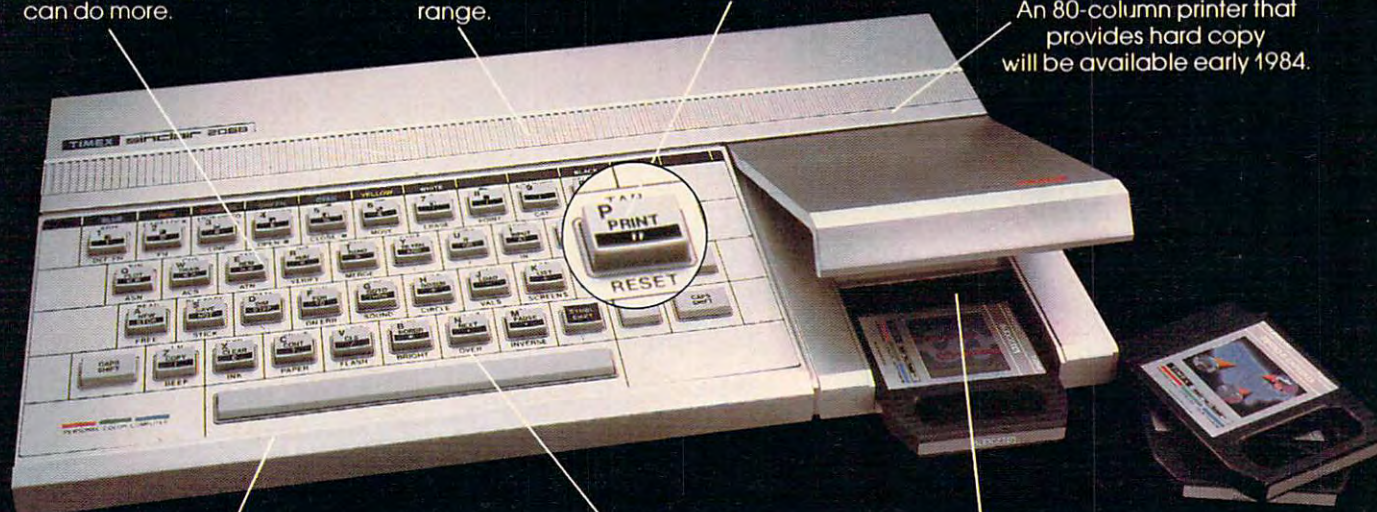
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ASM 35

THE BEGINNER'S PAGE

Richard Mansfield, Senior Editor

Zones Of Unpredictability Part 2

The RND command is a necessary part of most computer games or computerized simulations of real events. That's because life (as far as we know) has a random quality. Perhaps it's our limited viewpoint, but some things do seem to be accidental. When you play Poker, or if you write a Poker game on your computer, you'll see randomness in action. When cards are shuffled and dealt, something accidental, something unpredictable is supposed to happen — no one knows what order the cards are in when they are passed around.

Last month we explored some of the general rules for working with the RND command in BASIC. However, since it is one of the less *transportable* of the BASIC instructions, we need to go into some of the specific differences in the ways that each particular computer handles RND. *Transportable* means the ease with which a program written in one computer's BASIC will run on another's BASIC. There are always a few adjustments to make, but some programs are so machine specific (especially graphics programs) that they're very hard to translate and are, therefore, not very transportable. Different computer brands tend to have specific peculiarities in their use of RND.

But before looking into the particular use and syntax of RND on your computer, let's run a brief test of the randomness of your RND. RND on any computer is an effort to cause accidental, unpredictable results. The more unpredictable, the better. One simple way that we can test your RND is to see if it favors one number over another. If we limit the test to the numbers 1 through 10, will it hit, say, 3 more often than 7?

Type in the program and RUN it. You'll see the statistics on how often each number is turning up. Ideally, you'll end up with 10 percent for each number. At first, of course, the percentages will

be off, but if you let the program run for a while, you should get pretty close to even distribution.

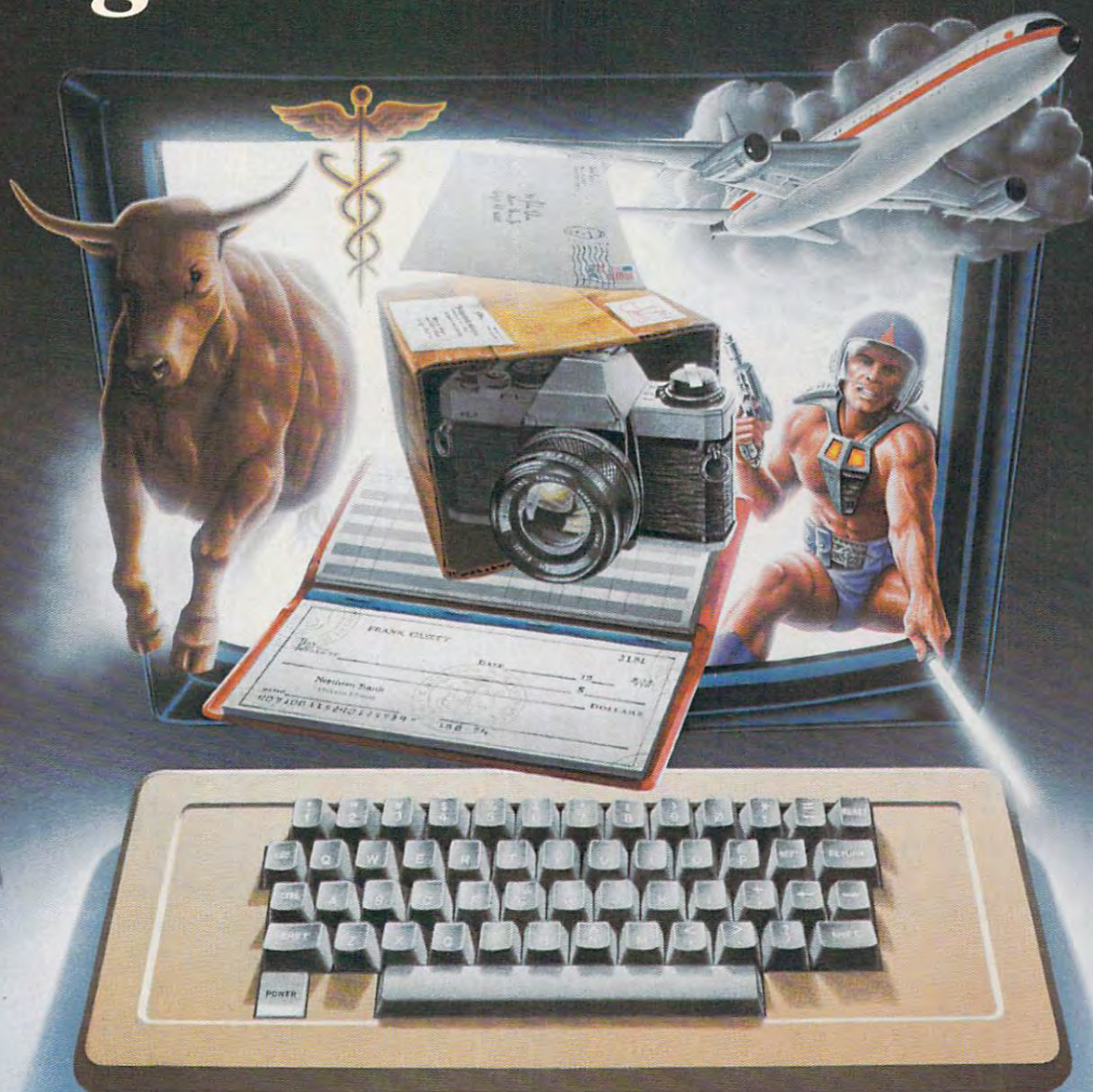
There are a few general programming techniques to notice here. If you add up the percents, you won't get precisely 100 percent. That's because we're using the INT command to round off the numbers printed on the screen. The computer is working with extended decimal fractions, but for neatness, we're not printing everything out. Take off the INT to see how messy things get. Also look at line 40. Here 1 is added to X each time we get a random number. That's so we'll have numbers 1 – 10 instead of 0 – 9. Remember that an array (a collection of numbered variables) will start with zero. That is, A(0) is the first "cell" in an A() array. To make it easier for us to keep straight, we can just ignore the A(0) cell and work with the cells from 1 on up.

Can you tell why line 100 is necessary? At the start of our test, some numbers won't come up at all. They will leave a zero in their A() array variable cell. The computer won't allow you to divide by zero. So, we need to put in a special test for zero and then skip over line 110 where the division would normally occur.

Special Seeding

There's an important aspect of randomness which is not tested by this program: order of arrival. A computer which gave the numbers 1 through 10 in order, each cycle through the test, would look perfect on the test. The distribution would be exactly 10 percent, but it certainly wouldn't be a good randomness generator. There are two aspects to the randomness of the order of arrival of numbers. First, you don't want the same sequence of random numbers each time you turn on the computer. We'll call this the start-up sequence. With a repeating start-up sequence, each time

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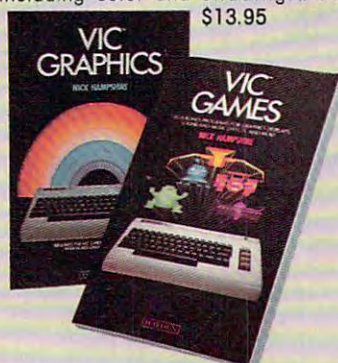
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you played Poker the first hand of the evening would be identical to the last night's first hand. And the second hand would match last night's second hand. And so on.

The second aspect is repeating sequences within a program. You don't want to have a short sequence of random numbers that starts repeating itself (1534215342...). Last month we dealt with both of these issues and discovered that, in fact, the order on several computers is *not* random unless you take a special step to mix things up.

The special step is called *seeding* and it means using something random as a starting place. Computers are relentlessly logical. It's not easy for them to do things accidentally, to create randomness. So, they use a special *algorithm* (a method) to try to mix things up. The RND command takes a number (the seed), turns it inside out (by "rotating" it in its binary form), multiplies it by itself, rounds it off, and so forth. All this twisting and turning is designed to come up with an unexpected number. However, if the starting place is the same, the result will be the same. The same algorithm is used each time. That's where random seeding comes in.

It's Fast. You're Not.

If you give RND a seed from the computer's ultra-fast, *realtime* clock, you won't get the same seed twice. (Realtime means time which passes as humans use it: 60 minutes to an hour, etc. All computers have internal timers, but not all have clocks that keep realtime.) That's the method used by all of our computers except the Apple; it has no realtime clock. Why don't you ever get the same seed when it comes from the clock? Because this clock is terrifically fast and you're not. The time it takes you to turn on the computer, type RUN, and hit RETURN is never exactly the same. Consequently, the start-up time for a game will depend on *you* and that's plenty random by computer standards: if you bat an eyelash, the computer clock has registered hundreds of time cycles. In any case, you'll need to know how to work with your particular RND, and it will help you translate programs from alien BASICS if you also have some idea of how the other computers use RND. Here are some notes on how to use RND on several popular computers:

- Commodore Computers. You can first seed the RND with (TI), the special variable which holds the current value of the clock. To do this, you would write a line early in your program like this:

```
10 A = RND(-TI)
```

This will cause the computer to provide a different sequence each time the computer is turned on. That is, the seed will depend on the clock and it will be called upon when you type

RUN to start the program. To insure that calls to RND later in the program are also highly random, use RND (0).

- Atari. There are no special requirements for the Atari. It seeds the RND generator itself. Whenever you call upon RND, you'll get both randomized as well as different start-up sequences each time the computer is turned on. The syntax is the same as Commodore: A = RND (X). It doesn't matter what X is.

- TRS-80 Color Computer. Same syntax, but use RND (0) to achieve both randomized sequences and random start-ups.

- TI-99/4A. Using RND alone will result in identical sequences. To avoid that, you should use the additional command RANDOMIZE early in a program:

```
10 RANDOMIZE
100 A = RND
```

Further, our TI columnist, C. Regena, suggests using RANDOMIZE before each call to RND to insure total randomness.

- Timex/Sinclair. To call the clock for a seed, you should put the following line early in a program:

```
10 RAND 0
```

and then call RND the same way the TI does (no argument in parentheses):

```
100 A = RND
```

RND, when it follows RAND 1 - 65535 (any of these numbers), will result in a repeating sequence of "random numbers" which is the same each time power is turned on (if you use the same number after RAND). The computer generates 65536 numbers to use for its random numbers. The number following RND determines the entry point into this sequence of numbers. However, when you use zero after RAND, the entry point into the list of numbers is determined by how long the TV has been turned on. This is essentially the same solution that the Commodore computers use.

- Apple. Because the Apple doesn't contain a clock, the best way to seed the RND is to ask the user to hit a key, within a loop:

```
10 PRINT "Press RETURN when ready to start"
20 IF PEEK (-16384) < 128 THEN A = RND(1):
   GOTO 20
```

This will give you a random seed to prevent start-up sequence repetitions. The value in address -16384 will remain below 128 until a key is pressed. Thus, you'll keep reading off numbers via the RND, but will have reached an unpredictable position in the list by the time you hit RETURN. Following that, use RND (1) for the best randomness. There is a bug, however, in the Apple's BASIC which causes the sequences to

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Behind the lower door are a top shelf for paper, feeding the printer, and a bottom shelf to receive printer copy as well as additional storage.

Stand fits same computers as the CS-1632 as well as the Apple I and II, IBM-PC, Franklin and many others.

The cabinet dimensions overall: 39-1/2" high x 49" wide x 27" deep.

Keyboard shelf 20" deep x 26" wide. Disk drive shelf 15-34" deep x 26" wide. Top shelf for monitor 17" deep x 27" wide. Printer shelf 22" deep x 19" wide.



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start repeating themselves rather quickly. There's no cure for it.

One final note about RND. If you're writing a game, one way to test it is to deliberately violate the randomizing rules we've mentioned above. There are cases when you will *want* to have a repeating, nonrandom sequence of numbers to check things within the program. If that's what you're after, you can leave out the randomizing seeds and test things against the resulting known, predictable patterns.

Randomness Test

```
10 GOSUB 500
20 FOR I = 1 TO 100
30 T = T + 1
40 X = INT (RND (1) * 10):X=X+1
50 A(X)=A(X)+1
60 NEXT I
70 GOSUB 500
80 FOR I=1 TO 10
90 PRINT I;
100 IFA(I)=0 THEN PRINT "-- 0%":GOTO 120
110 PRINT "--";INT(T/A(I));"% "
120 :NEXT I
130 GOTO 20
500 PRINT "{CLR}": REM CLEAR THE SCREEN
510 RETURN
```

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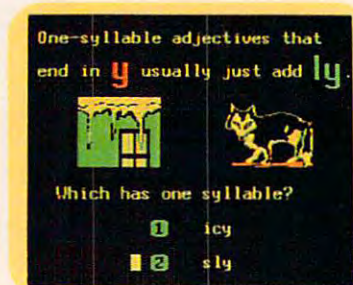
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CALORIE COP

Gerald P. Graham

This program determines your calorie output for a great variety of activities (from sitting to weight lifting), and gives you your total daily energy output. With screen instructions and menu, it's simple to use. Written for the Atari, versions for the Apple, VIC, 64, TI, and Color Computer are also included.

In the December 1982 issue of *COMPUTE!*, Charles Brannon presented a program for calculating the calories in your diet. It also estimates your daily needs and then predicts how long it will take you to get rid of any extra weight you want to lose.

"Calorie Cop" is a companion program which determines the caloric output for each activity you perform. It also calculates the calories expended for each activity so you can see your total daily energy output. When you RUN the program you are given instructions and then a seven-page, alphabetical menu of activities from archery to wrestling. Just press the letter corresponding to your activity, and if you don't see it, continue to press RETURN to turn the pages until you find it. If your activity is not listed, then use one that is comparable.

Keep in mind that the results should be modified by knowledge of the context of the activities. Some activities require greater skill and coordination than others, thus a higher caloric output. In cases where an unskilled person is competing against a skilled person, the former usually works harder. Desire and effort are also factors. One research study involved filming very heavy individuals playing tennis doubles. The very heavy players were found to be standing 65 percent of the time. Whereas vigorous tennis doubles requires .046 calories per minute per pound of weight, standing is worth only .011 cal/min/lb.

Do not use this or any other diet/exercise program except under the advice and consent of your physician.



Many different options are available in "Calorie Cop." Atari version.

Program 1: Calorie Cop (Atari Version)

```
5 GRAPHICS 0:CLR
10 DIM NAME$(20)
12 GRAPHICS 18
14 POSITION 5,4: ? #6:"CALORIE COP"
30 FOR DELAY=1 TO 2500:NEXT DELAY
35 SETCOLOR 0,0,0
40 FOR DELAY=1 TO 400:NEXT DELAY
55 GRAPHICS 0:SETCOLOR 4,2,10:SETCOL
   OR 3,0,4:COLOR 1:POKE 752,1
60 ? : ? : ? "THIS PROGRAM WILL TELL Y
   OU HOW MANY":?
62 ? "CALORIES YOU USE FOR A PARTICU
   LAR":?
64 ? "ACTIVITY. YOU WILL BE PROVIDE
   D AN":?
66 ? "ACTIVITY MENU THAT WILL TELL Y
   OU HOW":?
68 ? "MANY CALORIES EACH ACTIVITY US
   ES EACH":?
70 ? "MINUTE FOR EACH POUND OF YOUR
   BODY":?
```


Betcha Can't Play Just One!



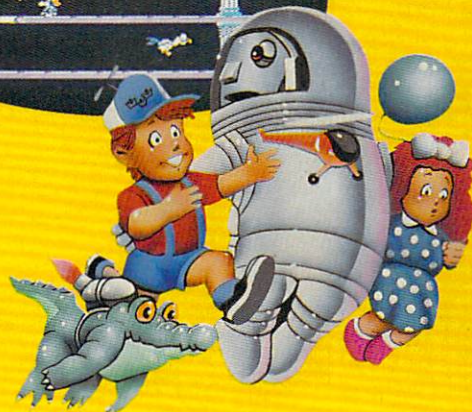
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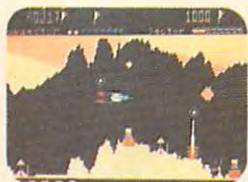
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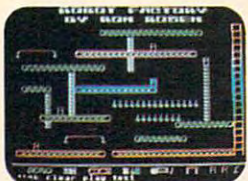
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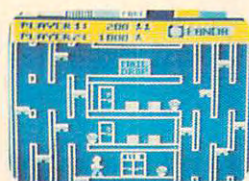
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```

72 ? "WEIGHT. IT WILL ALSO GIVE YOU
    A TOTAL"
74 ? "OF ALL CALORIES USED. PLEASE
    WRITE FOR: ? "THE MENU TO APPEAR."
78 FOR DELAY=1 TO 5000:NEXT DELAY
80 GRAPHICS 0:SETCOLOR 4,2,10:SETCOL
    OR 3,0,2:COLOR 1
100 GRAPHICS 0:POKE 752,1
105 OPEN #1,4,0,"K":POKE 82,0
110 DIM A$(1),ACTIVITY$(39),AMOUNT$(
    4)
250 IF CAL THEN 730
260 PX=0:PY=3:GOSUB 1020
270 FOR I=1 TO 18
280 READ ACTIVITY$,CL
290 IF ACTIVITY$="END" THEN 330
300 POSITION PX,PY:PRINT CHR$(I+192)
    ;"-";ACTIVITY$:PY=PY+1
320 NEXT I
330 REM
340 IF PEEK(20)>60 AND PEEK(20)<120
    THEN POSITION 2,23:?"ENTER LEFT
    ER OF ACTIVITY{12 SPACES}";
350 IF PEEK(20)>120 AND PEEK(20)<180
    THEN POSITION 2,23:?"PRESS RET
    URN TO GO TO NEXT PAGE";
360 IF PEEK(20)>180 THEN POSITION 2,
    23:?"PRESS * WHEN DONE
    {20 SPACES}";:POKE 20,0
365 IF PEEK(764)=255 THEN 340
370 GET #1,A:A$=CHR$(A):IF (A$<"A" O
    R A$>"R") AND A$<>CHR$(155) AND
    A$<>"*" THEN 340
380 IF A$<>CHR$(155) THEN 410
390 NX=NX+1:IF ACTIVITY$="END" THEN
    RESTORE :NX=0
400 GOTO 260
410 RESTORE
420 IF A$="#" THEN 600
430 IF A$="*" THEN 660
440 FOR I=1 TO NX*18+ASC(A$)-64
450 READ ACTIVITY$,CL
460 NEXT I
475 GRAPHICS 0:SETCOLOR 4,3,0:COLOR
    1
480 ? :? " ACTIVITY: ";ACTIVITY$
490 ? :? " THIS ACTIVITY USES ";AMOU
    NT$:CL:?" CALORIES PER MINUTE P
    ER POUND"
500 ? :? " IF YOU TYPED THE WRONG LE
    TTER THEN"
505 ? " ENTER ZEROS BELOW"
510 ? :? " ENTER LENGTH OF ABOVE ACT
    IVITY"
520 TRAP 520:PRINT " IN MINUTES";:PO
    KE 752,0:INPUT MIN:POKE 752,1:TR
    AP 40000
530 IF MIN=0 THEN 590
540 IF MIN<0 THEN PRINT "{DOWN}
    {BELL}":GOTO 470
550 ? :? " ENTER YOUR BODY WEIGHT IN
    POUNDS":INPUT LBS
552 IF LBS<0 THEN PRINT "{DOWN}
    {BELL}":GOTO 470
555 OUTPUT=LBS*MIN*CL
556 ?
557 ? " CALORIES USED FOR THIS ACTIV
    ITY= ";OUTPUT
558 ?
560 PRINT " TOTAL CALORIES USED SO F
    AR = ";:CAL=CAL+CL*MIN*LBS:PRINT
    CAL
570 ? :PRINT " PRESS RETURN TO CONTI
    NUE..."
580 GET #1,A:A$=CHR$(A):IF A$<>CHR$(
    155) THEN 580
590 RESTORE :NX=0:GOTO 260
650 MIN=1:GOTO 560
660 GRAPHICS 0:CLR
670 DIM END$(20)
675 GRAPHICS 2+16
680 POSITION 5,3:?"#6:"THAT'S ALL"
690 POSITION 5,6:?"#6:" FOLKS"
700 FOR DELAY=1 TO 1000:NEXT DELAY
710 END
1020 PRINT "{CLEAR}";
1120 PRINT "{40 R}"
1125 ? " ■ ■ ■ ■ ■ ACTIVITY MENU ■
    ■ ■ ■ ■ ■"
1130 RETURN
1140 DATA ARCHERY,.034
1150 DATA BADMINTON-singles-Moderate
    ,.039
1160 DATA BADMINTON-singles-Vigorous
    ,.065
1170 DATA BASEBALL-Infield or Outfie
ld,.031
1180 DATA BASEBALL-Pitching or Catch
    ing,.040
1190 DATA BASKETBALL-Moderate,.047
1200 DATA BASKETBALL-Vigorous,.066
1210 DATA BED MAKING,.031
1220 DATA BICYCLING-Downhill,.018
1230 DATA BICYCLING-Slow-5 mph-Level
    ,.030
1240 DATA BICYCLING-Moderate-10 mph-
    Level,.050
1250 DATA BICYCLING-Fast-13 mph or U
pphill,.072
1255 DATA BOXING-IN RING,.101
1257 DATA BOXING-SPARING,.063
1260 DATA BOWLING,.028
1270 DATA CANOEING-2.5 mph,.029
1280 DATA CONVERSING-QUIETLY,.011
1290 DATA COOKING-STANDING,.013
1300 DATA DANCING-Slow,.029
1310 DATA DANCING-Moderate,.045
1320 DATA DANCING-Fast,.064
1330 DATA DRESSING & UNDESSING,.03
    0
1340 DATA DRIVING A CAR,.019
1350 DATA DUSTING,.010
1360 DATA EATING,.011
1370 DATA EXERCISES-Abdominal,.020
1380 DATA EXERCISES-Balancing,.016
1390 DATA EXERCISES-Hopping or Jumpi
ng,.043
1400 DATA EXERCISES-Trunk Bending,.
    023
1410 DATA FENCING-Moderate,.033
1420 DATA FENCING-Vigorous,.057
1430 DATA FIELD HOCKEY-Other than go
alie,.063
1440 DATA FIELD HOCKEY-Goalie,.030
1450 DATA FISHING,.016
1460 DATA FOOTBALL-Backs & Ends,.05
    0
1470 DATA FOOTBALL-Linemen,.040
1480 DATA GARDENING,.030
1490 DATA GOLF-carrying clubs-Crowde
d,.030
1500 DATA GOLF-carrying clubs-Uncrow
    ded,.035
1510 DATA GYMNASTICS-Light,.030

```


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```

1520 DATA GYMNASTICS-Heavy, .056
1530 DATA HANDBALL, .063
1540 DATA HIKING, .042
1550 DATA HILL OR STAIR CLIMBING, .060
1560 DATA HORSEBACK RIDING-Walk, .019
1570 DATA HORSEBACK RIDING-Trot, .046
1580 DATA HORSEBACK RIDING-Gallop, .067
1590 DATA IRONING, .018
1600 DATA JUDO, .087
1602 DATA JUMPING ROPE-70 - 80 counts/min., .078
1603 DATA KARATE, .087
1605 DATA LACROSSE-Other than goalie, .063
1608 DATA LACROSSE-Goalie, .030
1610 DATA LISTENING TO RADIO OR RECORDS, .010
1620 DATA MOTOR BOATING, .016
1630 DATA MOUNTAIN CLIMBING, .086
1632 DATA PAINTING-INSIDE, .015
1634 DATA PAINTING-OUTSIDE, .035
1636 DATA PLAYING CARDS, .011
1638 DATA PLAYING DRUMS, .030
1640 DATA PLAYING HORN, .013
1642 DATA PLAYING PIANO, .018
1646 DATA RACQUETBALL, .063
1650 DATA RESTING-Lying down, .008
1660 DATA RESTING-Sitting, .009
1670 DATA ROWING-slow-2.5 mph, .036
1680 DATA ROWING-Vigorous, .118
1690 DATA RUNNING-Level-1 mile in 11 min., .071
1700 DATA RUNNING-Level-1 mile in 10 min., .078
1710 DATA RUNNING-Level-1 mile in 9 min., .085
1720 DATA RUNNING-Level-1 mile in 8 min., .092
1730 DATA RUNNING-Level-1 mile in 7 min., .100
1740 DATA RUNNING-Level-1 mile in 6 min., .110
1750 DATA RUNNING-Level-1 mile in 5 min., .130
1760 DATA SAILING, .020
1770 DATA SCRUBING, .032
1780 DATA SEWING OR KNITTING, .010
1785 DATA SHOPPING, .028
1790 DATA SHOWERING, .034
1795 DATA SINGING-standing, .017
1800 DATA SITTING-Quietly, .010
1810 DATA SITTING-WRITING, .013
1820 DATA SKATING-Moderate, .036
1830 DATA SKATING-Vigorous, .064
1840 DATA SKIING-SNOW-Downhill, .059
1850 DATA SKIING-SNOW-Level-slow, .054
1860 DATA SKIING-SNOW-Level-fast, .078
1865 DATA SLEEPING, .007
1870 DATA SOCCER-Other than goalie, .063
1880 DATA SOCCER-Goalie, .030
1890 DATA SQUASH, .070
1900 DATA STANDING-Quietly, .011
1920 DATA STATIONARY RUNNING-70 - 80 counts/min., .078
1930 DATA STUDYING, .014
1940 DATA SWIMMING-CRAWL-30 yds/min., .058
1950 DATA SWIMMING-CRAWL-40 yds/min., .071
1960 DATA SWIMMING-BACKSTROKE-30 yds/min., .035
1970 DATA SWIMMING-BACKSTROKE-40 yds/min., .055
1980 DATA SWIMMING-BREASTROKE-30 yds/min., .048
1990 DATA SWIMMING-BREASTROKE-40 yds/min., .064
2000 DATA SWIMMING-BUTTERFLY, .078
2010 DATA TABLE TENNIS-Moderate, .026
2020 DATA TABLE TENNIS-Vigorous, .040
2030 DATA TELEPHONING, .011
2040 DATA TENNIS-SINGLES-Moderate, .046
2050 DATA TENNIS-SINGLES-Vigorous, .065
2060 DATA TENNIS-DOUBLES-Moderate, .038
2070 DATA TENNIS-DOUBLES-Vigorous, .046
2080 DATA TYPING, .015
2090 DATA VOLLEYBALL-BEGINNERS-Moderate, .020
2100 DATA VOLLEYBALL-BEGINNERS-Vigorous, .036
2110 DATA VOLLEYBALL-SKILLED-Moderate, .040
2120 DATA VOLLEYBALL-SKILLED-Vigorous, .065
2130 DATA WALKING-LEVEL-2 MPH, .022
2140 DATA WALKING-LEVEL-3 MPH, .030
2150 DATA WALKING-LEVEL-4 MPH, .039
2160 DATA WALKING-LEVEL-5 MPH, .064
2170 DATA WASHING DISHES, .015
2180 DATA WASHING HANDS & FACE, .020
2190 DATA WATCHING TV, .010
2195 DATA WATER SKIING, .053
2200 DATA WEIGHT LIFTING-Arms, .050
2210 DATA WEIGHT LIFTING-Legs, .060
2220 DATA WEIGHT LIFTING-Whole body, .065
2230 DATA WRESTLING, .091
2300 DATA END, 0,0

```

Program 2:

Calorie Cop (Microsoft Version—Apple, 64, VIC, Color Computer)

```

1 WI = 40:LE = 24
5 HOME
10 PRINT : PRINT : PRINT : PRINT
15 PRINT TAB(WI / 2 - 5); "CALORIE CO
  p"
30 FOR I = 1 TO 1000: NEXT I
40 HOME
50 PRINT "THIS PROGRAM WILL TELL YOU H
  OW MANY"
55 PRINT : PRINT "CALORIES YOU USE FOR
  A PARTICULAR"
60 PRINT : PRINT "ACTIVITY. YOU WILL
  BE PROVIDED AN"
65 PRINT : PRINT "ACTIVITY MENU THAT W
  ILL TELL YOU HOW"
70 PRINT : PRINT "MANY CALORIES EACH A
  CTIVITY USES EACH"
75 PRINT : PRINT "MINUTE FOR EACH POUN

```

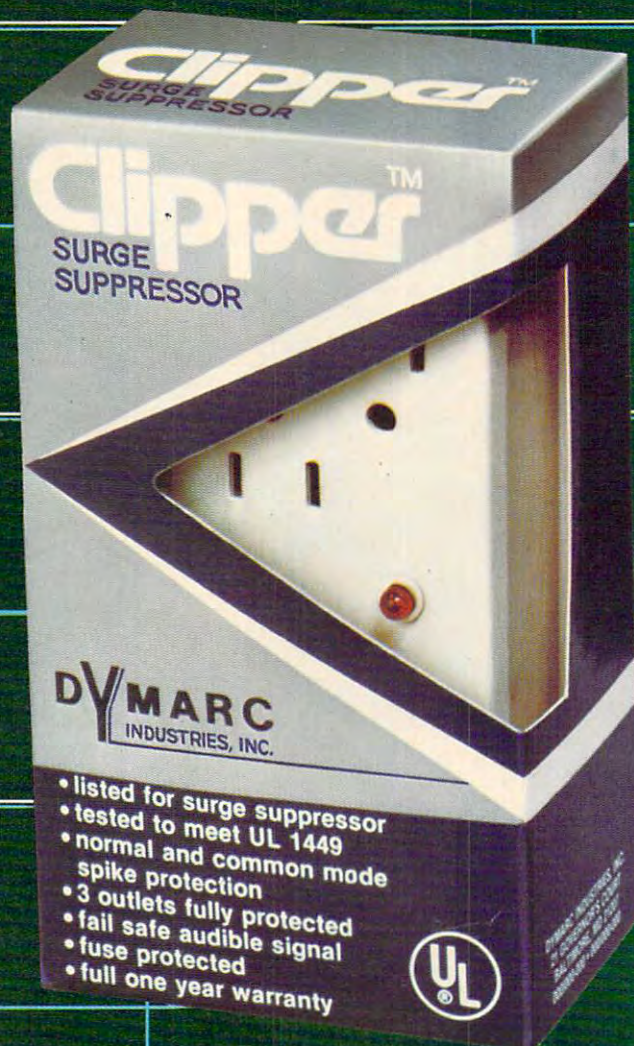

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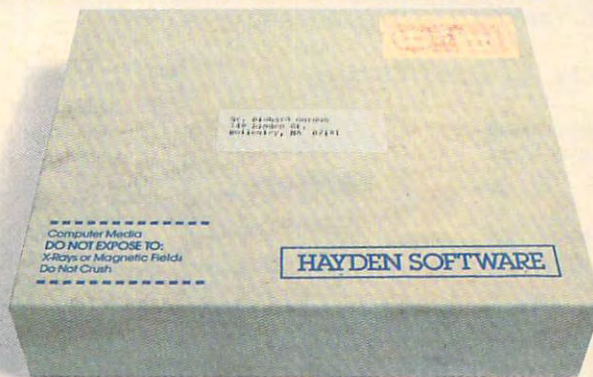
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```

      D OF YOUR BODY"
80 PRINT : PRINT "WEIGHT. IT WILL ALS
      O GIVE YOU A TOTAL"
85 PRINT : PRINT "OF ALL CALORIES USED
      ."
90 PRINT : PRINT "PRESS ANY KEY WHEN F
      INISHED";
95 GET A$
250 IF CAL = 1 THEN 730
260 GOSUB 1020
270 FOR I = 1 TO LE - 4
280 READ ACTIVITY$,CL
290 IF ACTIVITY$ = "END" THEN 330
300 PRINT CHR$(64 + I);"-";ACTIVITY$

320 NEXT I
330 I = I - 1
340 PRINT : PRINT "CHOICE ";
350 GET A$
355 IF (A$ < "A" OR A$ > CHR$(I + 64
      )) AND A$ < > "0" AND A$ < > CHR$(
      13) THEN 350
360 IF A$ < > CHR$(13) THEN 410
370 NX = NX + 1: IF ACTIVITY$ = "END"
      THEN RESTORE :NX = 0
400 GOTO 260
410 RESTORE
430 IF A$ = "0" THEN 660
440 FOR I = 1 TO NX * (LE - 4) + ASC
      (A$) - 64
450 READ ACTIVITY$,CL
460 NEXT I
470 HOME
480 PRINT : PRINT "ACTIVITY: ";ACTIVIT
      Y$
490 PRINT : PRINT "THIS ACTIVITY USES:
      ": PRINT CL
500 PRINT "CALORIES PER MINUTE PER"
510 PRINT "POUND"
520 PRINT : PRINT "ENTER LENGTH OF ABO
      VE"
530 PRINT "ACTIVITY IN MINUTES";
540 INPUT MIN
545 IF MIN = 0 THEN 590
547 IF MIN < 0 THEN 540
550 PRINT : PRINT "ENTER YOUR BODY WEI
      GHT"
555 IF MIN < 0 THEN 540
560 PRINT "IN POUNDS";
570 INPUT LBS
572 IF LBS < 0 THEN 570
575 OUTPUT = LBS * MIN * CL
577 PRINT "CALORIES USED FOR THIS"
578 PRINT "ACTIVITY= ";OUTPUT
579 PRINT : PRINT "TOTAL CALORIES USED
      ."
580 PRINT "SO FAR= ";:CAL = CAL + OUTP
      UT: PRINT CAL
582 PRINT "PRESS RETURN TO CONTINUE ..
      ."
585 GET A$: IF A$ < > CHR$(13) THEN
      585
590 RESTORE :NX = 0: GOTO 260
660 HOME
665 PRINT : PRINT : PRINT "YOUR TOTAL
      CALORIES": PRINT "ARE ";CAL
670 PRINT : PRINT : PRINT : PRINT "THA
      T'S ALL FOLKS!"
680 FOR PAUSE = 1 TO 1000: NEXT PAUSE

```

```

690 END
1020 HOME
1030 PRINT "--<ACTIVITY MENU>--"
1035 RETURN
1036 REM BE SURE TO INCLUDE THE DATA
      STATEMENTS IN PROGRAM 4

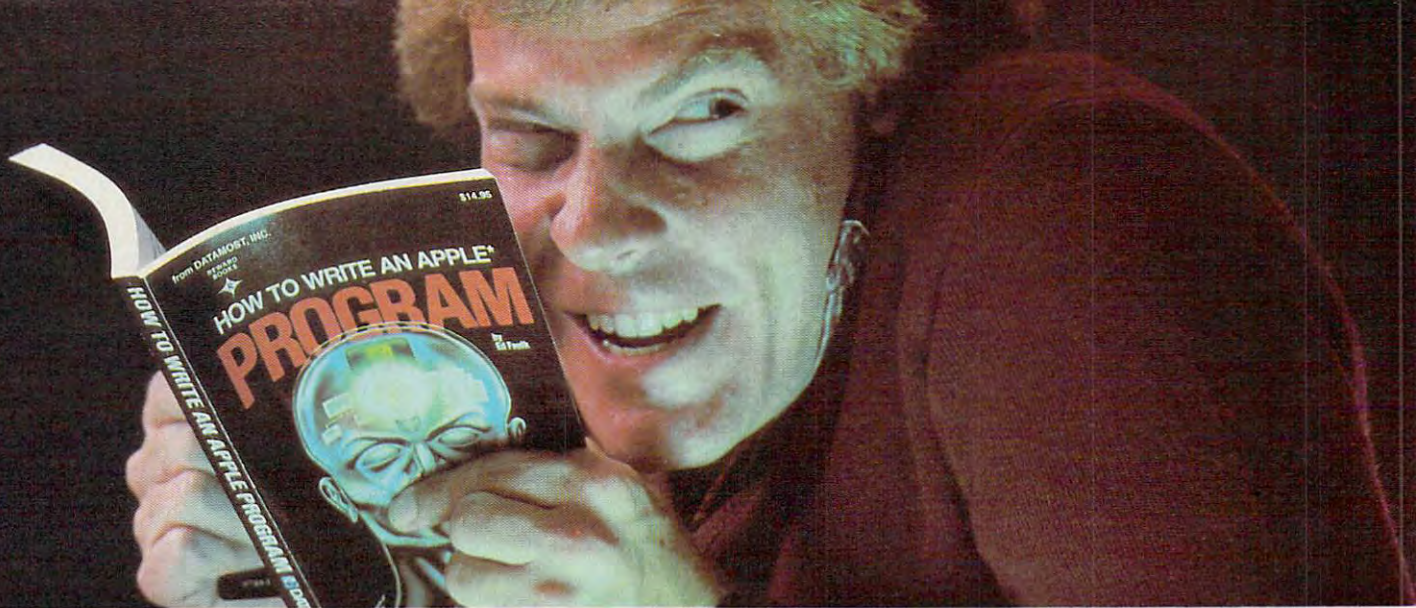
```

Program 3: Calorie Cop (TI-99/4A Version)

```

100 CALL CLEAR
110 PRINT " ";TAB(9);"CALORIE COP"
120 PRINT :::::::::::
180 FOR I=1 TO 1000
190 NEXT I
200 CALL CLEAR
210 PRINT "THIS PROGRAM WILL TELL Y
      OU"
220 PRINT "HOW MANY CALORIES YOU US
      E "
230 PRINT "FOR A PARTICULAR ACTIVIT
      Y."
240 PRINT "YOU WILL BE PROVIDED AN"
250 PRINT "ACTIVITY MENU THAT WILL
      TELL";
260 PRINT "YOU HOW MANY CALORIES EA
      CH"
270 PRINT "ACTIVITY USES EACH MINUT
      E"
280 PRINT "FOR EACH POUND OF YOUR B
      ODY"
290 PRINT "WEIGHT. IT WILL ALSO GI
      VE"
300 PRINT "YOU A TOTAL OF ALL CALOR
      IES"
310 PRINT "USED."
320 PRINT :::::::::::
330 PRINT "WAIT FOR MENU TO APPEAR"
340 FOR I=1 TO 5000
350 NEXT I
360 IF CAL=1 THEN 32767
370 GOSUB 970
380 FOR I=1 TO 18
390 READ ACT$,CL
400 IF ACT$="END" THEN 430
410 PRINT CHR$(64+I);"-";ACT$
420 NEXT I
430 REM
440 PRINT "CHOICE :";
450 CALL KEY(0,K,S)
460 IF S=0 THEN 450
470 A$=CHR$(K)
480 IF A$=CHR$(13) THEN 540
490 IF A$="0" THEN 930
500 IF A$<"A" THEN 450
510 IF A$>CHR$(I+63) THEN 450
520 RESTORE
530 GOTO 590
540 NX=NX+1
550 IF ACT$<>"END" THEN 370
560 RESTORE
570 NX=0
580 GOTO 370
590 FOR I=1 TO NX*18+ASC(A$)-64
600 READ ACT$,CL
610 NEXT I
620 CALL CLEAR
630 PRINT :::
640 PRINT "ACTIVITY :";ACT$
650 PRINT :::
660 PRINT "THIS ACTIVITY USES ";CL

```

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Microsoft And TI-99/4A Version Notes For Calorie Cop

Kevin Martin, Editorial Programmer

The Microsoft version of Calorie Cop is written for the Apple and will run on the Commodore 64, VIC-20, and the Color Computer with minor changes.

On the 64 and the VIC, add these lines:

```
5 PRINT "{CLR}"
40 PRINT "{CLR}"
95 GETA$:IFA$=""THEN95
350 GETA$:IFA$=""THEN350
585 GETA$:IFA$<>CHR$(13)THEN585
660 PRINT "{CLR}"
1020 PRINT "{CLR}"
```

On the Color Computer:

```
5 CLS
40 CLS
95 IF INKEY$="" THEN 95
350 A$=INKEY$:IF A$="" THEN 350
585 IF INKEY$<>CHR$(13) THEN 585
660 CLS
1020 CLS
```

The instructions for the program are formatted for a 40-column screen. For the 64, VIC, and Color Computer, substitute the following lines so that the instructions fit on your screen, or you may simply leave these lines out. If you leave them out, then also remove line 95.

For the 64, change line 1 to:

```
1 WI=40:LE=25
```

For the VIC, change line 1 to:

```
1 WI=22:LE=23
```

For the Color Computer, change line 1 to:

```
1 WI=32:LE=16
```

To exit the program type a 0 when you are prompted for CHOICE. Before ENDING, the program will tell you the total number of calories used.

Be sure to type in Program 4 along with either the Microsoft or TI-99/4A version. This program contains the necessary DATA statements for both of these versions.

```
670 PRINT "CALORIES PER MINUTE PER"
680 PRINT "POUND"
690 PRINT "::"
700 PRINT "IF YOU ENTERED THE WRONG"
710 PRINT "ACTIVITY TYPE IN ZEROS B"
720 PRINT "ELOW"
730 PRINT "ENTER LENGTH OF ACTIVITY"
740 PRINT "IN"
740 INPUT "MINUTES:":MIN
750 IF MIN=0 THEN 800
760 PRINT
770 PRINT "INPUT YOU BODY WEIGHT IN"
780 PRINT "POUNDS:":LBS
790 OUT=LBS*MIN*CL
800 PRINT "CALORIES FOR THIS ACTIVI"
810 PRINT "TY"
810 PRINT "EQUALS ";OUT
820 PRINT
830 PRINT "TOTAL CALORIES USED SO F"
840 PRINT "AR"
840 CAL=CAL+OUT
850 PRINT "IS ";CAL
860 PRINT "::"
870 PRINT "PRESS ANY KEY TO CONTINU"
880 PRINT "E.."
880 CALL KEY(0,K,S)
```

```
890 IF S=0 THEN 880
900 RESTORE
910 NX=0
920 GOTO 370
930 CALL CLEAR
940 PRINT "TOTAL CALORIES =";CAL
950 PRINT "BYE!"
960 END
970 CALL CLEAR
980 PRINT " ---=<<ACTIVITY MENU>>== "
990 RETURN
1000 REM BE SURE TO INCLUDE THE DAT
A STATEMENTS IN PROGRAM 4
```

Program 4: Calorie Cop (DATA Statements For Programs 2 And 3)

```
1040 DATA ARCHERY,.034
1050 DATA BADMINTON-MODERATE,.039
1060 DATA BADMINTON-VIGOROUS,.065
1070 DATA BASEBALL,.031
1080 DATA BASEBALL-PITCH&CATCH,.040
1090 DATA BASKETBALL-MODERATE,.047
1100 DATA BASKETBALL-VIGOROUS,.066
1110 DATA BED MAKING,.031
1120 DATA BICYCLING-DOWNHILL,.018
1130 DATA BICYCLING-SLOW-LEVEL,.030
```


1140 DATA BICYCLING-MODERATE,.050
 1150 DATA BICYCLE-FAST-UPHILL,.072
 1160 DATA BOXING-IN RING,.101
 1170 DATA BOXING-SPARING,.063
 1180 DATA BOWLING,.028
 1190 DATA CANOEING,.029
 1200 DATA CONVERSING,.011
 1210 DATA COOKING,.013
 1220 DATA DANCING-SLOW,.029
 1230 DATA DANCING-MODERATE,.045
 1240 DATA DANCING-FAST,.064
 1250 DATA DRESSING&UNDRESSING,.030
 1260 DATA DRIVING A CAR,.019
 1270 DATA DUSTING,.010
 1280 DATA EATING,.011
 1290 DATA EXERCISES-ABDOMINAL,.020
 1300 DATA EXERCISES-BALANCING,.016
 1310 DATA EXERCISES-JUMPING,.043
 1320 DATA EXERCISES-BENDING,.023
 1330 DATA FENCING-MODERATE,.033
 1340 DATA FENCING-VIGOROUS,.057
 1350 DATA FIELD HOCKEY,.063
 1360 DATA FIELD HOCKEY-GOALIE,.030
 1370 DATA FISHING,.016
 1380 DATA FOOTBALL-BACKS&ENDS,.050
 1390 DATA FOOTBALL-LINEMEN,.040
 1400 DATA GARDENING,.030
 1410 DATA GOLF-CROWDED&WALKING,.030
 1420 DATA GOLF-UNCROWDED&WALK,.035
 1430 DATA GYMNASTICS-LIGHT,.030
 1440 DATA GYMNASTICS-HEAVY,.056
 1450 DATA HANDBALL,.063
 1460 DATA HIKING,.042
 1470 DATA HILL&STAIR CLIMBING,.060
 1480 DATA HORSEBACK RIDE-WALK,.019
 1490 DATA HORSEBACK RIDE-TROT,.046
 1500 DATA HORSEBACK -GALLOP,.067
 1510 DATA IRONING,.018
 1520 DATA JUDO,.087
 1530 DATA JUMPING ROPE,.087
 1540 DATA KARATE,.087
 1550 DATA LACROSSE,.063
 1560 DATA LACROSSE-GOALIE,.030
 1570 DATA LISTENING TO RADIO,.010
 1580 DATA MOTOR BOATING,.016
 1590 DATA MOUNTAIN CLIMBING,.086
 1600 DATA PAINTING-INSIDE,.015
 1610 DATA PAINTING-OUTSIDE,.035
 1620 DATA PLAYING CARDS,.011
 1630 DATA PLAYING DRUMS,.030
 1640 DATA PLAYING HORN,.013
 1650 DATA PLAYING PIANO,.018
 1660 DATA RACQUETBALL,.063
 1670 DATA RESTING-LYING DOWN,.008
 1680 DATA RESTING-SITTING,.009
 1690 DATA ROWING-SLOW,.036
 1700 DATA ROWING-VIGOROUS,.118
 1710 DATA RUNNING-11 MIN./MILE,.071
 1720 DATA RUNNING-10 MIN./MILE,.078
 1730 DATA RUNNING-9 MIN./MILE,.085
 1740 DATA RUNNING-8 MIN./MILE,.092
 1750 DATA RUNNING-7 MIN./MILE,.100
 1760 DATA RUNNING-6 MIN./MILE,.110
 1770 DATA RUNNING-5 MIN./MILE,.130
 1780 DATA SAILING,.020
 1790 DATA SCRUBING,.032
 1800 DATA SEWING OR KNITTING,.010
 1810 DATA SHOPPING,.028
 1820 DATA SHOWERING,.034

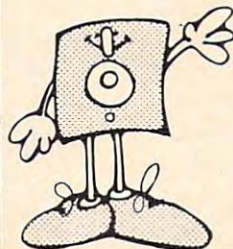
1830 DATA SINGING-STANDING,.017
 1840 DATA SITTING-QUIETLY,.010
 1850 DATA SITTING-WRITING,.013
 1860 DATA SKATING-MODERATE,.036
 1870 DATA SKATING-VIGOROUS,.064
 1880 DATA SKIING-DOWNHILL,.059
 1890 DATA SKIING-LEVEL-SLOW,.054
 1900 DATA SKIING-LEVEL-FAST,.078
 1910 DATA SLEEPING,.007
 1920 DATA SOCCER,.063
 1930 DATA SOCCER-GOALIE,.030
 1940 DATA SQUASH,.070
 1950 DATA STANDING,.011
 1960 DATA STATIONARY RUNNING,.078
 1970 DATA STUDYING,.014
 1980 DATA SWIM-CRAWL-30YDS/MIN,.058
 1990 DATA SWIM-CRAWL-40YDS/MIN,.071
 2000 DATA SWIM-BKSTRK-30YDS/MN,.035
 2010 DATA SWIM-BKSTRK-40YDS/MN,.055
 2020 DATA SWIM-BREAST-30YDS/MN,.048
 2030 DATA SWIM-BREAST-40YDS/MN,.064
 2040 DATA SWIM-BUTTERFLY,.078
 2050 DATA TABLE TENNIS-MOD,.026
 2060 DATA TABLE TENNIS-VIG,.040
 2070 DATA TELEPHONING,.011
 2080 DATA TENNIS-SNGLS-MOD,.046
 2090 DATA TENNIS-SNGLS-VIG,.065
 2100 DATA TENNIS-DBLES-MOD,.038
 2110 DATA TENNIS-DBLES-VIG,.046
 2120 DATA TYPING,.015
 2130 DATA VOLLEYBALL-BEG.-MOD,.020
 2140 DATA VOLLEYBALL-BEG.-VIG,.036
 2150 DATA VOLLEYBALL-SKILL-MOD,.040
 2160 DATA VOLLEYBALL-SKILL-VIG,.065
 2170 DATA WALKING-2 MPH,.022
 2180 DATA WALKING-3 MPH,.030
 2190 DATA WALKING-4 MPH,.039
 2200 DATA WALKING-5 MPH,.064
 2210 DATA WASHING DISHES,.015
 2220 DATA WASHING HANDS & FACE,.020
 2230 DATA WATCHING TV,.010
 2240 DATA WATER SKIING,.053
 2250 DATA WEIGHT LIFTING-ARMS,.050
 2260 DATA WEIGHT LIFTING-LEGS,.060
 2270 DATA WEIGHT LIFTING-BODY,.065
 2280 DATA WRESTLING,.091
 2290 DATA END,0,0

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Paycheck Analysis

Larry L. Bihlmeyer

This short program analyzes your paycheck for accuracy and lets you project future take-home pay so you can budget accordingly. Also included is a variable table for easy and personalized modification. For the VIC, 64, PET, Atari, TI, Apple, Color Computer, and Timex/Sinclair.

Here's a handy program that can help you do two important jobs: verify the accuracy of your take-home pay; and estimate your take-home pay in the future so you can do accurate budget studies. This is especially helpful since federal, state, and Social Security taxes are constantly changing. The program can easily be modified so you can adapt it to your situation. Here's how:

- The program is set up for two pay periods a month. If your pay periods are different, change the wording and revise the tax table values used in lines 620 to 840. You can get the necessary information from your payroll department. Also, as withholding rates change in the future, just update these lines accordingly.

- Cost of living pay is set up as a separate variable. It is taxed at a fixed 20 percent rate where I work. If your cost of living is taxed the same as regular pay, change (B + A) to TS in line 600 and change line 850 to F = TX.

- Overtime pay is included (lines 280–290) as a separate variable since it may be at a different hourly rate and may vary with each pay period.

- Deductions are found on lines 340 to 590. Just modify them if appropriate. Make sure to change line 860 if you use different variable names.

"Paycheck Analysis" will run on the VIC, 64, PET, Atari, TI, Apple, Color Computer, and Timex/Sinclair. Atari owners *only*: you must include line 110. Timex/Sinclair users must use LET

before any assignment statements (for example, at line 320, type LET A = R*N).

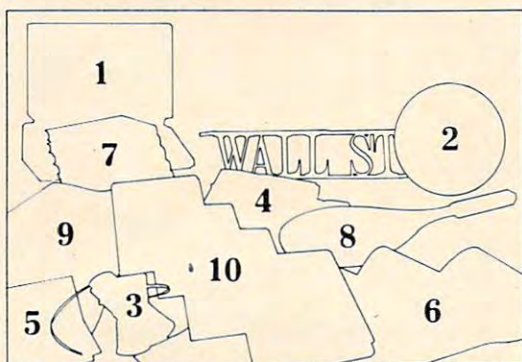
Program Variables

Variable	Description
B	Base salary (gross)
C	Cost of living (gross)
A	Overtime (gross)
R	Overtime hourly rate
N	Overtime hours worked
TS	Total salary (gross)
EX	Number of federal exemptions claimed
P\$	Pay period(s)
U	Deduction — United Fund
T	Stock plan deduction
D	Payroll deduction — credit union
S	Social Security tax (FICA)
M	State tax withholding
IN	Income subject to federal tax
TX	Federal tax withheld
F	Total federal tax
TH	Take-home pay
I	Life insurance deduction

Paycheck Analysis

```
100 REM USE LINE 110 ONLY ON ATARI
110 DIM A$(1),B$(1),P$(1)
120 PRINT "{CLR}"
130 REM SUBSTITUTE COMMAND IN LINE 120 TO
    CLEAR THE SCREEN ON YOUR COMPUTER
140 PRINT "----PAYCHECK ANALYSIS----"
150 PRINT "{3 SPACES}(6.92% STATE TAX)
    {3 SPACES}"
160 PRINT
170 PRINT
180 PRINT
190 PRINT "BASE SALARY? (GROSS-SEMIMONTHL
    Y)"
200 INPUT B
210 PRINT "COST OF LIVING (GROSS)?"
220 INPUT C
230 PRINT
```


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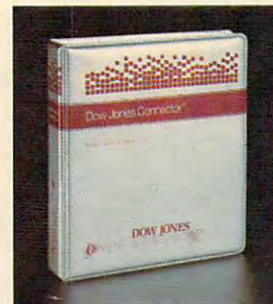


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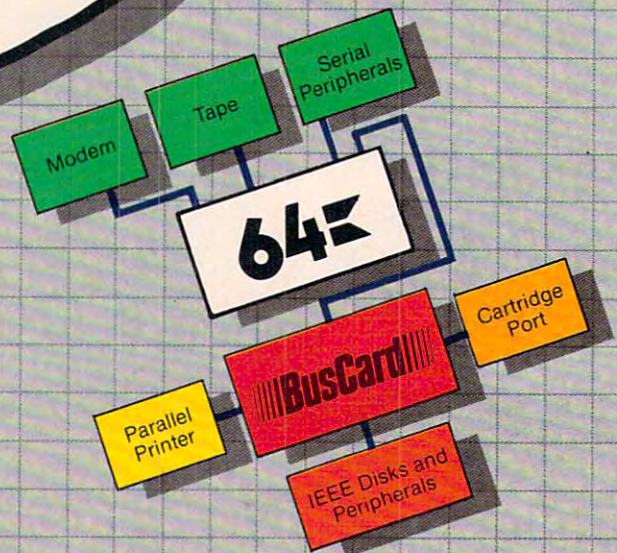


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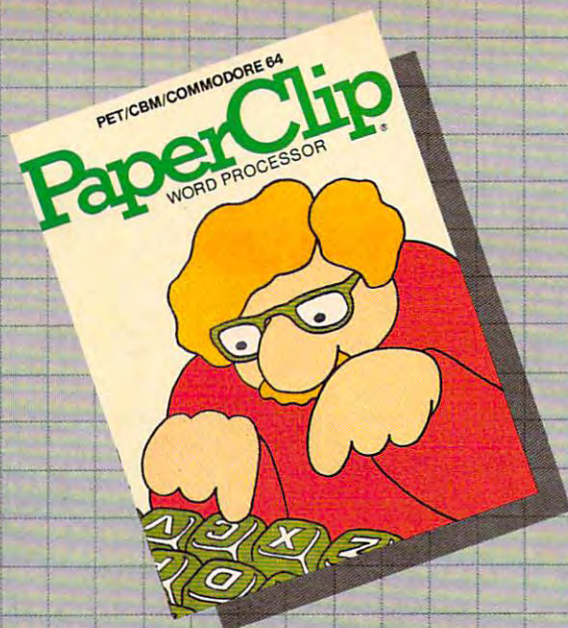
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```

240 PRINT "ANY OVERTIME?(SHIFT-SPACE)(Y/N
)"
250 INPUT A$
260 IF (A$<>"N")*(A$<>"Y") THEN 250
270 IF A$="N" THEN 340
280 PRINT "HOURLY OVERTIME RATE (GROSS)"
290 INPUT R
300 PRINT "NUMBER OF OVERTIME HOURS"
310 INPUT N
320 A=R*N
330 GOTO 360
340 A=0
350 REM GROSS SALARY W/ OVERTIME IN LINE
{SPACE}310
360 TS=B+C+A
370 PRINT "NUMBER OF FED EXEM CLAIMED:"
380 INPUT EX
390 REM DEDUCTIONS
400 PRINT
410 PRINT
420 PRINT "PAY PERIOD-MIDDLE(M) OR END(E)
:"
430 INPUT P$
440 IF (P$<>"E")*(P$<>"M") THEN 430
450 IF P$="E" THEN 490
460 I=13.50
470 REM I IS INSURANCE DED ONCE A MONTH
480 GOTO 500
490 I=0
500 U=10.00
510 REM U IS UNITED FUND
520 T=0
530 REM T IS STOCK PLAN
540 D=100.00
550 REM D IS CREDIT UNION PAYROLL DED
560 S=.067*TS
570 REM S IS FICA
580 M=(.0692*TS)-12.97
590 REM M IS STATE TAX
600 IN=(B+A)-41.66*EX
610 REM EX IS FEDERAL EXEM AND-IN IS TAXA
BLE INCOME
620 REM FED WITHHOLDING TABLE (MARRIED, P
AID SEMIMONTHLY)
630 IF IN>100 THEN 660
640 TX=0
650 GOTO 850
660 IF IN>253 THEN 690
670 TX=.12*(IN-100)
680 GOTO 850
690 IF IN>499 THEN 720
700 TX=18.36+.16*(IN-253)
710 GOTO 850
720 IF IN>772 THEN 750
730 TX=57.72+.19*(IN-499)
740 GOTO 850
750 IF IN>983 THEN 780
760 TX=109.50+.24*(IN-772)
770 GOTO 850
780 IF IN>1204 THEN 810
790 TX=160.23+.27*(IN-983)
800 GOTO 850
810 IF IN>1425 THEN 840
820 TX=219.90+.32*(IN-1204)
830 GOTO 850
840 TX=290.62+.37*(IN-1425)
850 F=TX+(.20*C)
860 TH=(B+C+A)-(F+M+S+I+U+T+D)
870 PRINT
880 PRINT
890 PRINT "TAKE HOME PAY IS $";INT(TH*100
+.5)/100
900 PRINT
910 PRINT
920 PRINT "DO ANOTHER ANALYSIS?"
930 INPUT B$
940 IF B$="Y" THEN 120
950 END

```

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Utility Bill Audit

Larry L. Bihlmeyer

As utility bills continue to rise, it's a good idea to check them for accuracy. Here's a practical program enabling you to verify your electric, gas, water, and phone bills. Written for all Commodores, TI, Apple, and Color Computer, an Atari version is also included.

"Utility Bill Audit" is a versatile program that lets you check your electric, gas, water, and phone bills for accuracy, or split the costs of these bills among the people living in your household. Also, if you are interested in energy savings (and who isn't these days?), you can monitor your daily electric and gas consumption with this program.

Program 1 will run on all Commodore machines, TI, Apple, and Color Computer. One minor modification, however, is required if you have a TI-99/4A, Apple, or Color Computer. Line 200 contains a statement to clear the screen and cursor home. Substitute the appropriate command for your machine in this line (CALL CLEAR for TI, HOME for Apple, CLS for the Color Computer).

Personalizing The Program

Before you RUN this program, it is necessary to have a thorough understanding of how each bill is calculated in the program. First, a particular bill is split up according to the values (2,1,2,4) given

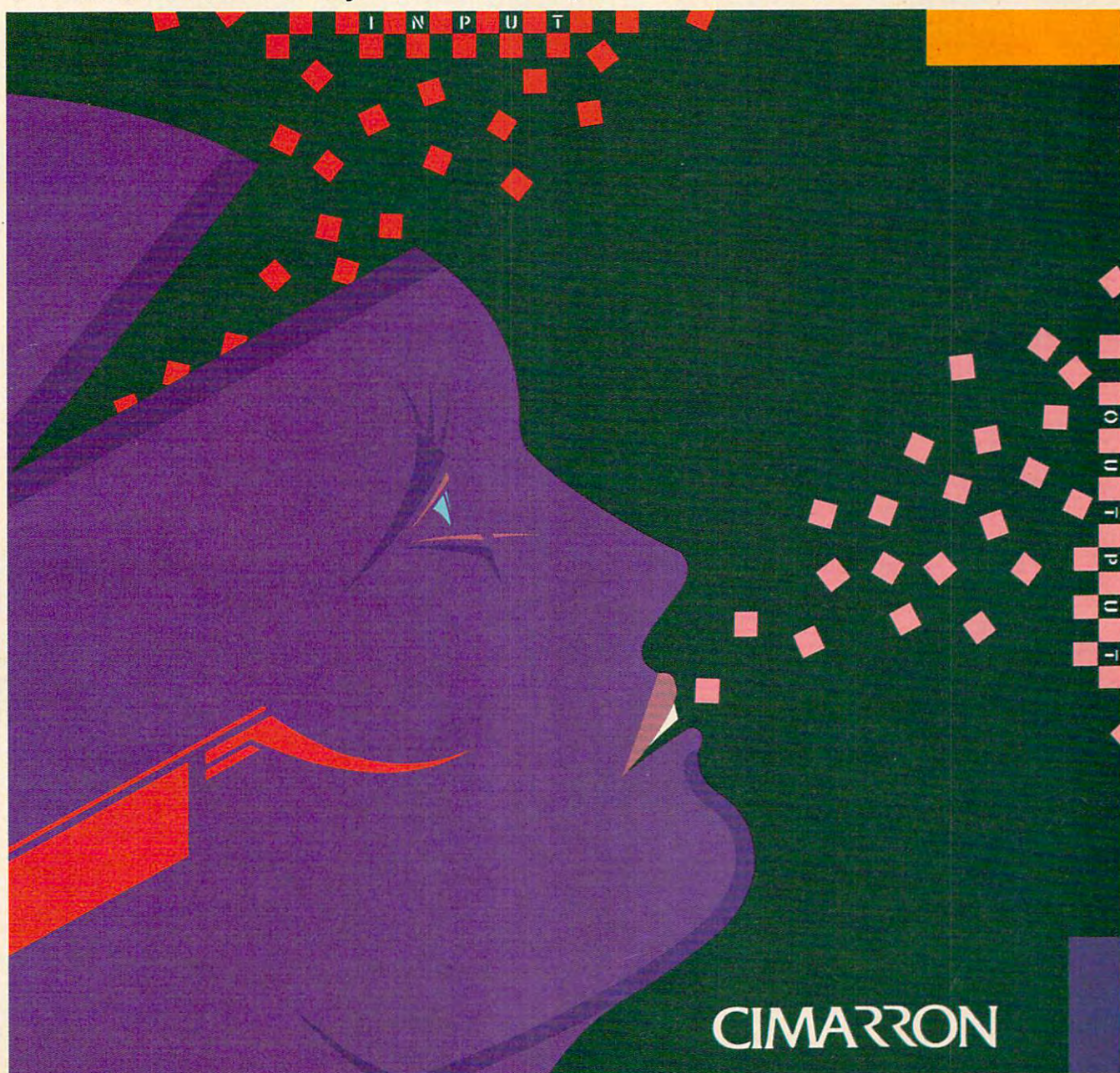
in the DATA statement in line 1640. These values are assigned to the variable N(X) and represent the number of individuals who must pay for each bill. In its present form, the program assumes that the electric and water bills will be paid by two individuals, the phone bill by four, and the gas bill by one individual. However, it's unlikely that these numbers will correspond to the financial arrangements in your household. So, be sure to substitute the appropriate values in this line before you continue. Of course, if the bills are paid by one individual in the house, simply replace all four numbers in line 1640 with 1,1,1,1.

Since the program works on the actual costs of your utility bills based on local rates, certain information about these rates must be provided before you can run the program. This information is READ in line 380 and 400 from the DATA statements in lines 1650 - 1680.

Notice that the first three DATA statements in this sequence have nine entries and apply to the electric, gas, and water bills respectively. Let's consider line 1650 as an example. The first entry in this line is the name of the utility (ELECTRIC) for which the rates that follow apply. The second entry is the unit of measurement for that particular utility (KWH for kilowatt hours). The next entry is the minimum service charge for the utility (\$5.40 for electricity). The fourth entry is the tax rate based on the sum of the service charge and the

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rate charge (0 percent for electric use). These first four DATA entries are READ in as A\$(1), B\$(1), M(1), and Z(1), respectively.

At this point, the numbers begin to get a little confusing, so read carefully. The next two numbers are cutoff limits for each electric rate and are represented in the program by L1(1) and L2(1). The last three numbers are the actual rates charged per KWH use for each level of usage (R1(1), R2(1), and R3(1) in the program). Thus, the program is presently set up so that the rate charged for electricity is \$.0495 for the first 350 KWH, \$.0565 for the next 950 KWH (i.e., 1300 minus 350), and \$.0541 for any usage exceeding 1300 KWH.

The DATA statement in line 1680 is easier to follow: the utility (PHONE), the minimum service charge (\$13.50), and the tax rate on the service charge and long distance calls (3 percent).

So, get out your most recent bills and read off the various rates (per KWH for electric, per CCF or hundred cubic feet for gas and water). If the rates are not given on a bill, contact the utility company to get a schedule of the latest rates. Then just substitute your local rates for those in the DATA statements in lines 1650 to 1680.

Program Operation

After inserting the correct rates, RUN the program. You will then be asked which utility bill you wish to check. The first three menu choices are electric, gas, and water. Bills for these three utilities are all calculated in the routine beginning at line 560. Let's look at an electric bill as an example.

When the routine at line 560 is executed, you will be required to INPUT the present and previous meter readings. These values can be read directly from your latest electric bill. Next, you must INPUT the number of days in the billing period. Then you will be asked to INPUT any adjustments to the bill, either positive (for example, connection fees, previous balances) or negative (credits).

The program will next calculate the amount of electricity consumed for the given period (defined as U in line 720). Then, depending on the value of U relative to the two rate limits, L1(1) and L2(X) (lines 740 and 750), an amount owed (T) before tax and adjustments will be calculated (lines 760, 780, and 800). Next, the tax on this amount will be determined (T1). And finally a total electric bill — the sum of the minimum charge, usage cost, tax, and adjustments — will be calculated (T3) in line 830.

The results are then PRINTed on the screen with provisions for formatting the output to two places past the decimal. Any numbers in the third place past the decimal are simply dropped. If you prefer rounded numbers, you could easily modify

the program to achieve that.

The routine beginning at line 560, as mentioned, also calculates the gas and water bills. These are based on the rates READ from the DATA statements in lines 1660 and 1670. Notice the sets of large numbers (precisely, 99999) in line 1660. The rates for gas where I live are the same, regardless of the amount used. By using large numbers here for the cutoff limits, L1(2) and L2(2), for this utility, it's unlikely that the actual usage will exceed these amounts (see lines 740 and 750). Thus, the charge for this commodity will always be based on the first rate, or R1.

The rates for water, as READ from the DATA statement in line 1670, are based on a single cutoff limit (L1(3)) of 1000 CCF. For less than this, a usage rate (R1(3)) of \$.144 per CCF is charged. If water usage exceeds 1000 CCF, a second rate (R2(3)) of \$.160 is charged. Again, using a very large number (99999) for the second cutoff limit (L2(3)) assures that the overall usage cost is based only on two rates.

Analyzing The Phone Bill

Phone bills are checked in a separate routine in the program beginning at line 1110. In this routine, adjustments to the bill are initially INPUT in the same manner as they are with the electric, gas, and water bills. Next, the person responsible for each long distance charge is required to INPUT the amount of each long distance call. A separate routine (lines 1260 – 1360) allows the individual to correct any typing mistakes. Finally, the amount owed by one individual is displayed.

The portion of the phone bill that each person must pay is the sum of their long distance tolls, a proportional amount of both the service charge and the billing adjustments, and a proportional amount of the tax levied on the service and long distance calls. Again, if only one person in the household foots the bills, the last number in line 1640 should be 1.

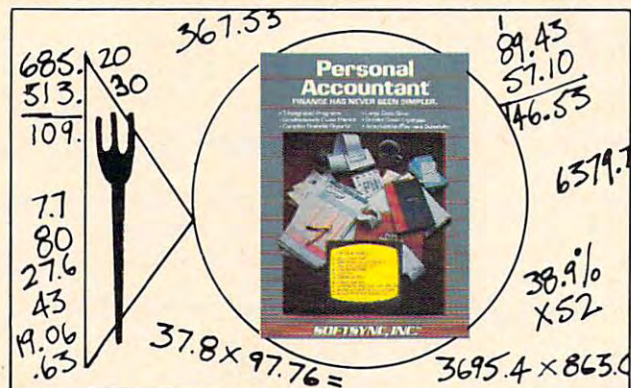
In addition to enabling you to catch billing errors and helping you to easily divide up household bills, this program can help you monitor your costs. If you add an energy-saving device that is supposed to save, say, 10 percent of your total electric bill, take a meter reading when it is installed and verify the savings with a later reading. You can also project weekly, monthly, and yearly savings for any utility in this manner.

Program 1: Microsoft & TI Version (Commodore, TI, Apple, Color Computer)

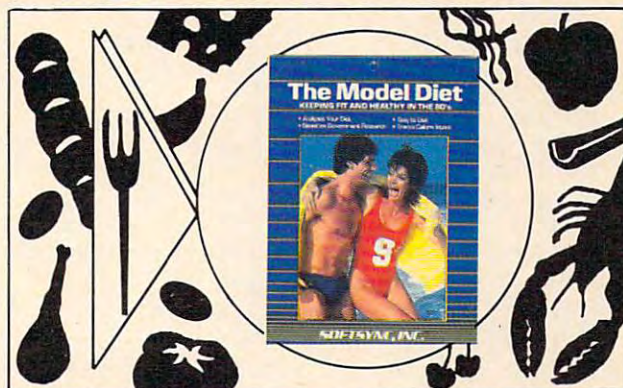
```
100 GOTO 330
110 A1=0
120 PRINT"INPUT ADJUSTMENTS TO BILL(+ OR
    {SPACE}- , '0' WHEN DONE)"
130 INPUT A
140 A1=A1+A
```


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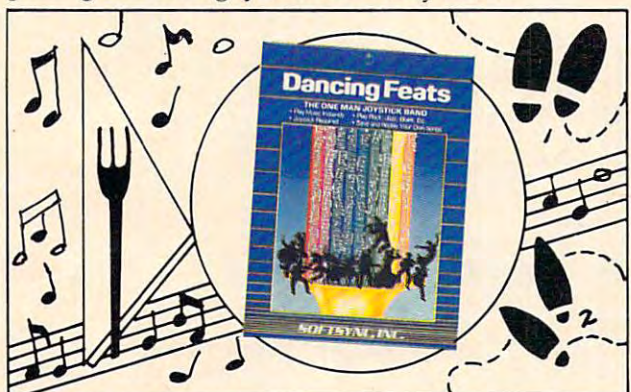
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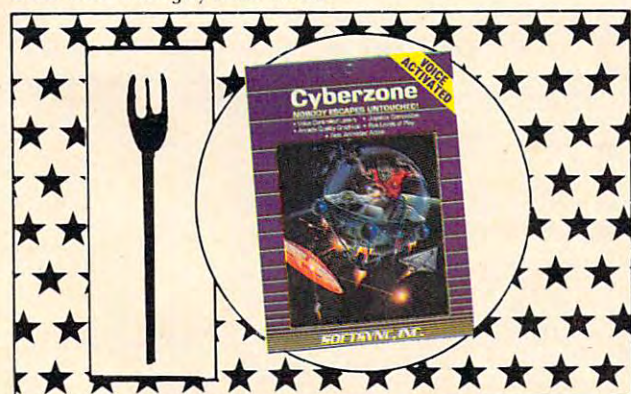
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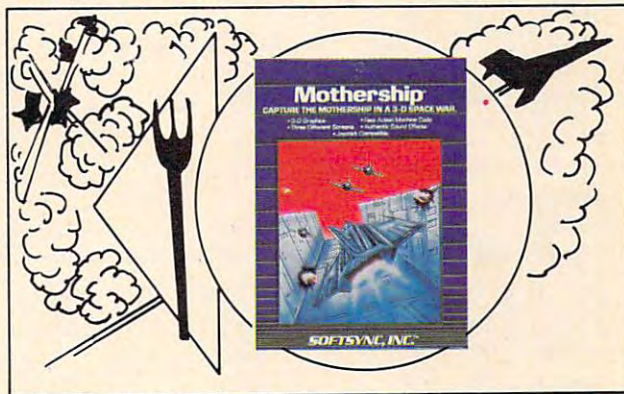
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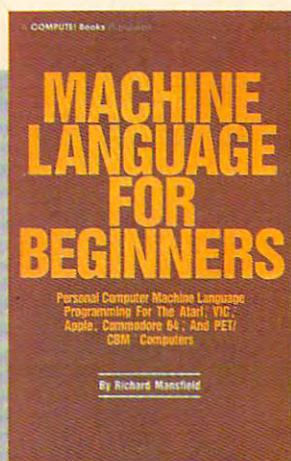

```

150 IF A=0 THEN 170
160 GOTO 130
170 GOSUB 250
180 GOSUB 290
190 RETURN
200 PRINT "{CLR}"
210 RETURN
220 PRINT "{2 SPACES}";A$(X);" BILL(CONT"
    )"
230 PRINT
240 RETURN
250 FOR I=1 TO 3
260 PRINT
270 NEXT I
280 RETURN
290 PRINT"INPUT C TO CONTINUE";
300 INPUT C$
310 GOSUB 200
320 RETURN
330 DIM A$(4),B$(4),L1(3),L2(3),M(4),R1(3
    ),R2(3),R3(3),W(50),Z(4)
340 FOR I=1 TO 4
350 READ N(I)
360 NEXT I
370 FOR I=1 TO 3
380 READ A$(I),B$(I),M(I),Z(I),L1(I),L2(I
    ),R1(I),R2(I),R3(I)
390 NEXT I
400 READ A$(4),M(4),Z(4)
410 GOSUB 200
420 PRINT"{2 SPACES}UTILITY BILL AUDIT"
430 GOSUB 250
440 PRINT" 1. ELECTRIC BILL"
450 PRINT" 2. GAS BILL"
460 PRINT" 3. WATER BILL"
470 PRINT" 4. PHONE BILL"
480 PRINT" 5. ALL OF THE ABOVE"
490 PRINT" 6. EXIT"
500 PRINT
510 PRINT
520 PRINT" CHOOSE AN OPTION ";
530 INPUT P
540 IF (P<1)+(P>6) THEN 530
550 ON P GOTO 1020,1050,1080,1110,1590,16
    90
560 GOSUB 200
570 PRINT"{4 SPACES}";A$(X);" BILL"
580 PRINT
590 PRINT"PREVIOUS METER READING"
600 INPUT E1
610 PRINT
620 PRINT"PRESENT METER READING"
630 INPUT E2
640 PRINT
650 PRINT"INPUT DAYS IN THE BILLING PERIO
    D"
660 INPUT D
670 GOSUB 250
680 GOSUB 290
690 GOSUB 200
700 GOSUB 220
710 GOSUB 110
720 U=E2-E1
730 Y=U/D
740 IF U>L2(X) THEN 800
750 IF U>L1(X) THEN 780
760 T=M(X)+R1(X)*U
770 GOTO 810
780 T=M(X)+R1(X)*L1(X)+R2(X)*(U-L1(X))
790 GOTO 810
800 T=M(X)+R1(X)*L1(X)+R2(X)*(L2(X)-L1(X)
    )+R3*(U-L2(X))
810 T1=T*Z(X)
820 T2=T+T1
830 T3=T2+A1
840 GOSUB 200
850 GOSUB 220
860 PRINT "USE FOR THE PERIOD IS ";INT(U*
    100)/100;" ";B$(X)
870 PRINT
880 PRINT "USE/DAY IS ";INT(Y*100)/100;"
    {SPACE}";B$(X);" OR $";
890 PRINT INT(T2/D*100)/100;"/DAY INCLUDI
    NG TAX"
900 PRINT
910 PRINT A$(X);" BILL:"
920 PRINT " W/OUT TAX{2 SPACES}:$";INT(T*
    100)/100
930 PRINT " TAX IS{5 SPACES}:$";INT(T1*10
    0)/100
940 PRINT" ADJ'TS{5 SPACES}:$";A1
950 PRINT
960 PRINT "{2 SPACES}*TOTAL*{3 SPACES}:$
    ";INT(T3*100)/100
970 IF N(X)=1 THEN 990
980 PRINT"SPLIT ";N(X);" WAYS:$";INT(T3/N
    (X)*100)/100
990 PRINT
1000 GOSUB 290
1010 RETURN
1020 X=1
1030 GOSUB 560
1040 GOTO 430
1050 X=2
1060 GOSUB 560
1070 GOTO 430
1080 X=3
1090 GOSUB 560
1100 GOTO 430
1110 GOSUB 200
1120 X=4
1130 PRINT "{5 SPACES}";A$(X);" BILL"
1140 PRINT
1150 GOSUB 110
1160 FOR K=1 TO N(X)
1170 I=1
1180 IF N(X)=1 THEN 1200
1190 PRINT"FOR PERSON #";K;",";
1200 PRINT "INPUT CHARGE FOR EACH LONG DI
    STANCE CALL (INPUT '0' WHEN DONE)"
1210 INPUT W(I)
1220 IF W(I)=0 THEN 1250
1230 I=I+1
1240 GOTO 1210
1250 GOSUB 200
1260 PRINT" PERSON #";K;",";
1270 FOR J=1 TO I-1
1280 PRINT "CALL #";J;"{2 SPACES}:$";W(J)
1290 PRINT
1300 PRINT "IS THIS CORRECT (Y/N)"
1310 INPUT C$
1320 IF C$="Y" THEN 1350
1330 PRINT "TYPE IN CORRECTION"
1340 INPUT W(J)
1350 PRINT
1360 NEXT J
1370 GOSUB 200
1380 GOSUB 220
1390 T=0
1400 FOR J=1 TO I-1
1410 T=T+W(J)
1420 NEXT J

```


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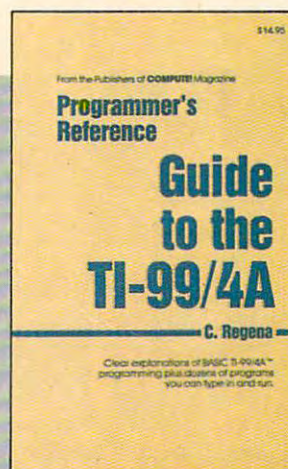


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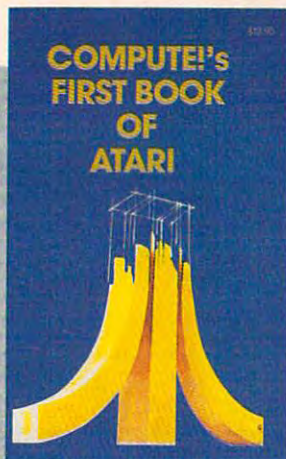


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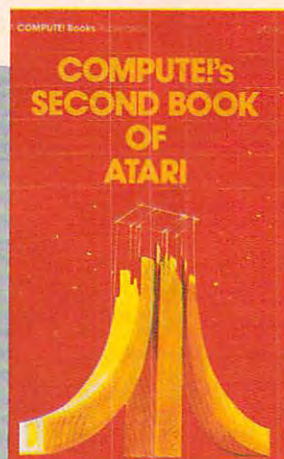


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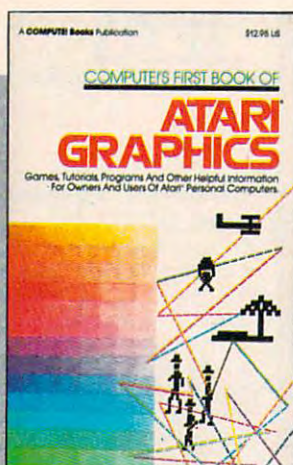


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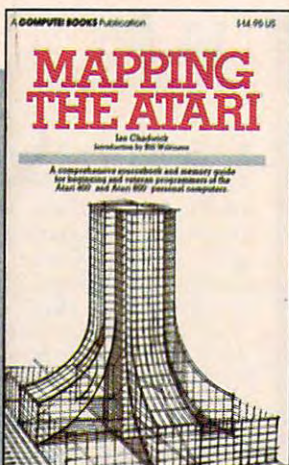


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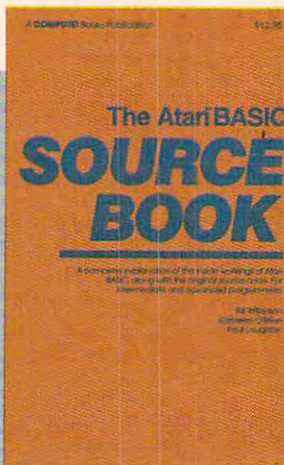


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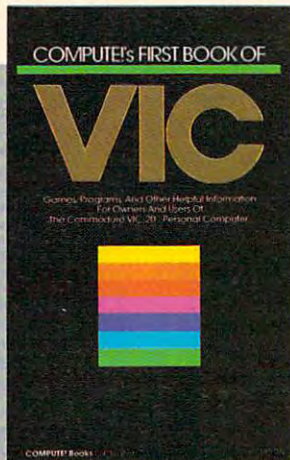


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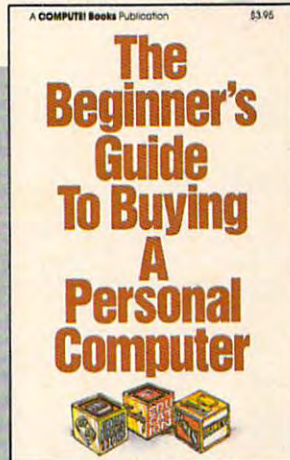
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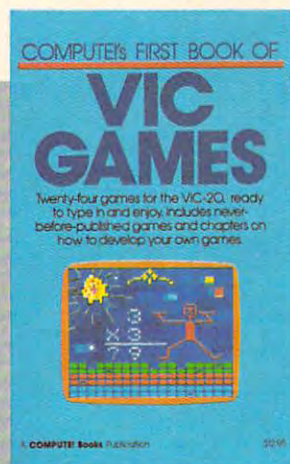
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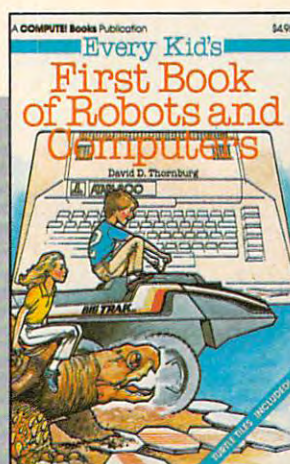
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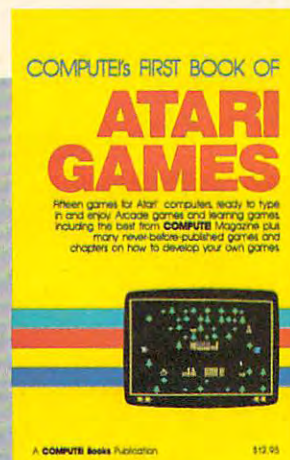


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```

1430 PRINT "SERVICE:{3 SPACES}$";INT(M(X)
/N(X)*100)/100
1440 PRINT
1450 PRINT "LD CALLS:{2 SPACES}$";T
1460 PRINT
1470 PRINT"ADJ'TS :{3 SPACES}$";INT(A1/N(
X)*100)/100
1480 PRINT
1490 T1=T+INT(M(X)/N(X)*100)/100
1500 T2=INT(T1*Z(X)*100)/100
1510 PRINT "TOTAL TAX: $";T2
1520 PRINT
1530 PRINT
1540 PRINT " TOTAL BILL: $";T1+T2+INT(A1/
N(X)*100)/100
1550 GOSUB 250
1560 GOSUB 290
1570 NEXT K
1580 GOTO 430
1590 FOR F=1 TO 3
1600 X=F
1610 GOSUB 560
1620 NEXT F
1630 GOTO 1110
1640 DATA 2,1,2,4
1650 DATA ELECTRIC,KWH,5.40,0,350,1300,.0
495,.0565,.0541
1660 DATA GAS,CCF,4.05,0,99999,99999,.495
41,0,0
1670 DATA WATER,CCF,3.26,0,500,99999,.144
,.160,0
1680 DATA PHONE,13.50,.03
1690 END

```

Program 2: Atari Version

```

100 GOTO 200
110 A1=0:PRINT "INPUT BILLING ADJUST
MENTS (+ OR -, '0' WHEN DONE)"
120 INPUT A:A1=A1+A
130 IF A=0 THEN 150
140 GOTO 120
150 GOSUB 180:GOSUB 190:RETURN
160 PRINT "{CLEAR}":RETURN
170 PRINT " ";A$(X*8-7,X*8);" BILL(C
ONT)":PRINT:RETURN
180 FOR I=1 TO 3:PRINT:NEXT I:RETUR
N
190 PRINT "INPUT C TO CONTINUE";:INP
UT C$:GOSUB 160:RETURN
200 DIM L1(3),L2(3),M(4),N(4),R1(3),
R2(3),R3(3),W(50),Z(4),A$(40),B$
(9),C$(1)
210 A$="ELECTRICGAS{5 SPACES}WATER
{3 SPACES}PHONE{3 SPACES}"
220 B$="KWHCCFCFF"
230 FOR I=1 TO 4:READ X:N(I)=X:NEXT
I:FOR I=1 TO 3
240 READ A,B,C,D,E,F,G
250 M(I)=A:Z(I)=B:L1(I)=C:L2(I)=D:R1
(I)=E:R2(I)=F:R3(I)=G
260 NEXT I
270 READ A,B:M(4)=A:Z(4)=B:GOSUB 160
280 PRINT "{8 RIGHT}UTILITY BILL AUD
IT"
290 GOSUB 180:PRINT "{3 RIGHT}1. ELE
CTRIC BILL":PRINT "{3 RIGHT}2. G
AS BILL"
300 PRINT "{3 RIGHT}3. WATER BILL":P
RINT "{3 RIGHT}4. PHONE BILL"
310 PRINT "{3 RIGHT}5. ALL OF THE AB

```

Atari Version Notes For Utility Bill Audit

Patrick Parrish, Programming Supervisor

The Atari version (Program 2) of "Utility Bill Audit" is set up like the Microsoft version. The primary difference in the Atari version, of course, is its handling of strings. A\$(X) and B\$(X) were used to define the type of utility and its units of usage in the Microsoft version. Since the Atari doesn't allow string arrays, A\$ and B\$ must be defined as one long string of individual substrings representing all utilities and their units. This is accomplished in lines 210 and 220. Thus, when a bill for a particular utility is to be checked, a corresponding portion of A\$ and B\$ will be accessed accordingly.

As an example of this, look at the statement in line 170. If you were checking an electric bill, then X would equal 1 and the first eight characters in A\$ or ELECTRIC would be PRINTed along with the word BILL.

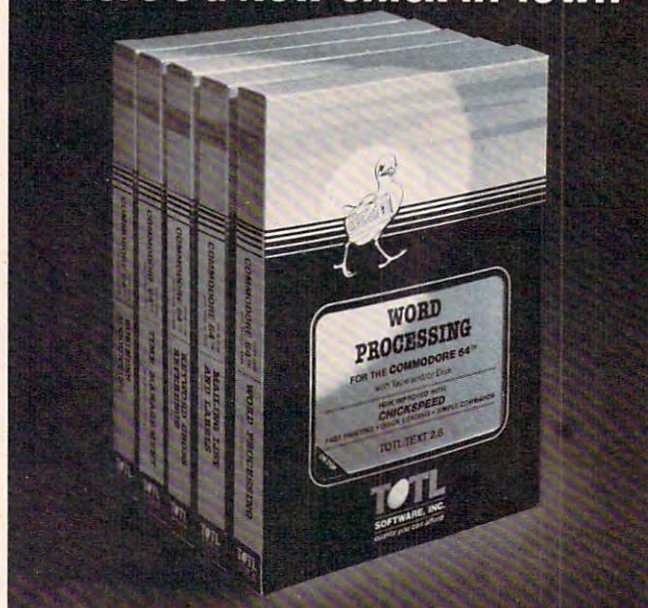
After removing entries for A\$ and B\$ from the DATA statements in lines 780 to 810, the remainder of these entries are defined by the same variables as they are in the Microsoft version. Read over the discussion on these DATA statements in the article. Then, adjust the values contained therein according to your local utility rate schedules.

```

OVE":PRINT "{3 RIGHT}6. EXIT":PR
INT:PRINT
320 PRINT "{3 RIGHT}CHOOSE AN OPTION
";
330 INPUT P:IF (P<1)+(P>6) THEN 330
340 ON P GOTO 540,550,560,570,760,82
0
350 GOSUB 160:PRINT "{4 SPACES}";A$(
X*8-7,X*8);" BILL":PRINT
360 PRINT "PREVIOUS METER READING":I
NPUT E1:PRINT
370 PRINT "PRESENT METER READING":IN
PUT E2:PRINT
380 PRINT "INPUT DAYS IN THE BILLING
PERIOD":INPUT D:GOSUB 180
390 GOSUB 190:GOSUB 160:GOSUB 170:GO
SUB 110:PRINT:U=E2-E1:Y=U/D
400 IF U>L2(X) THEN 440
410 IF U>L1(X) THEN 430
420 T=M(X)+R1(X)*U:GOTO 450
430 T=M(X)+R1(X)*L1(X)+R2(X)*(U-L1(X)
):GOTO 450
440 T=M(X)+R1(X)*L1(X)+R2(X)*(L2(X)-
L1(X))+R3(X)*(U-L2(X))
450 T1=T*Z(X):T2=T+T1:T3=T2+A1:GOSUB
160:GOSUB 170
460 PRINT "USE FOR THE PERIOD IS ";I

```


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```

NT(U*100)/100;" ";B$(X*3-2,X*3):
PRINT
470 PRINT "USE/DAY IS ";INT(Y*100)/1
00;" ";B$(X*3-2,X*3);" OR $";
480 PRINT INT(T2/D*100)/100;"/DAY":P
RINT "INCLUDING TAX":PRINT :PRIN
T A$(X*8-7,X*8);" BILL:"
490 PRINT " W/OUT TAX: $";INT(T*100)
/100:PRINT " TAX IS{3 SPACES}: $
";INT(T1*100)/100
500 PRINT " ADJ'TS{3 SPACES}: $";A1:
PRINT :PRINT " *TOTAL* : $";INT
(T3*100)/100
510 IF N(X)=1 THEN 530
520 PRINT :PRINT "SPLIT ";N(X);" WAY
S:$";INT(T3/N(X)*100)/100
530 PRINT :GOSUB 190:RETURN
540 X=1:GOSUB 350:GOTO 290
550 X=2:GOSUB 350:GOTO 290
560 X=3:GOSUB 350:GOTO 290
570 GOSUB 160:X=4:PRINT "{4 SPACES}"
;A$(X*8-7,X*8);" BILL"
580 PRINT :GOSUB 110
590 PRINT :FOR K=1 TO N(X):I=1:IF N(
X)=1 THEN 610
600 PRINT " FOR PERSON #";K;",";
610 PRINT "INPUT CHARGE FOR EACH LON
G DISTANCE CALL (INPUT '0' WHEN
{4 SPACES}DONE)"
620 INPUT D:W(I)=D:IF W(I)=0 THEN 64
0
630 I=I+1:GOTO 620
640 GOSUB 160:FOR J=1 TO I-1:PRINT "
PERSON #";K;",";
650 PRINT "CALL #";J;" :$";W(J):PRIN
T :PRINT "IS THIS CORRECT (Y/N)"
660 INPUT C$:IF C$="Y" THEN 680
670 PRINT "TYPE IN CORRECTION":INPUT
D:W(J)=D
680 PRINT :NEXT J
690 GOSUB 160:GOSUB 170:T=0:FOR J=1
TO I-1
700 T=T+W(J):NEXT J:PRINT "SERVICE:
{3 SPACES}$";INT(M(X)/N(X)*100)/
100:PRINT
710 PRINT "LD CALLS: $";T:PRINT
720 PRINT "ADJ'TS : {3 SPACES}$";INT(
A1/N(X)*100)/100:PRINT
730 T1=T+INT(M(X)/N(X)*100)/100:T2=I
NT(T1*Z(X)*100)/100
740 PRINT "TOTAL TAX: $";T2:PRINT :P
RINT
750 PRINT " TOTAL BILL: $";T1+T2+INT
(A1/N(X)*100)/100:GOSUB 180:GOSU
B 190:NEXT K:GOTO 290
760 FOR F=1 TO 3:X=F:GOSUB 350:NEXT
F:GOTO 570
770 DATA 2,1,2,4
780 DATA 5.40,0,350,1300,.0495,.0565
,.0541
790 DATA 4.05,0,99999,99999,.49541,0
,0
800 DATA 3.26,0,1000,99999,.144,.160
,0
810 DATA 13.50,.03
820 END

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If you compulsively keep records of gas mileage of your car or cars, you probably have noticed that there is often significant variability. Many factors can cause this: whether you are getting a "total" fill, which gas station you are getting your gas from, what type of driving you have been doing, the mechanical condition of your car, and weather conditions. If you own a small economy car, you have probably experienced the frustration of seeing results ranging from 10 to 40 miles to the gallon. Such data is useless to reveal whether or not changes you've made in your vehicle or driving habits are effective. If you own more than one vehicle, you might want to make a scientific comparison to determine which vehicle is giving you the best service.

Operating The Program

Gas Mileage is menu-driven and designed for use with a disk drive. The main menu consists of three choices:

- (1) GAS MILEAGE DISPLAY
- (2) PROGRAM FOR THOSE WANTING A

PRINTER OPTION

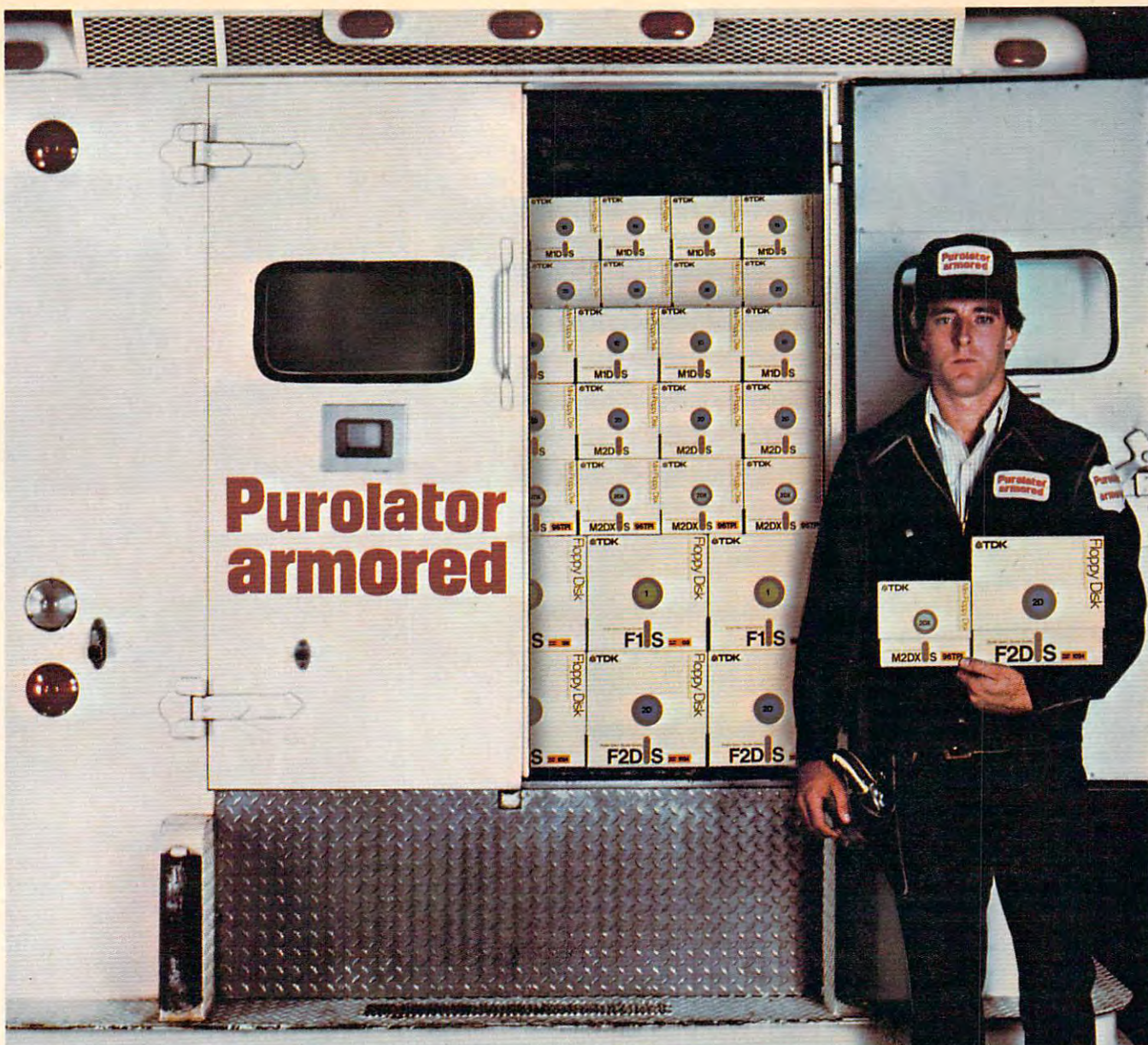
(3) OPTION FOR CREATING A NEW DATA FILE FOR ANOTHER VEHICLE

When you first run the program and the main menu is displayed, you'll have to choose option 3 to create an initial data file. The program will branch to line 610, which asks you to INPUT CAR'S NAME:. The car's name (N\$) becomes the data file's name. Any number of data files can be created and used in the program as long as no name is used twice. (This file naming technique can be valuable for other programs as it allows maximum use of the same program for different data files.) When using any N\$ input string variable to equal your desired data files, you can save yourself some typing by using the following sequence: "OPEN";N\$;"READ OR WRITE";N\$;"CLOSE";N\$.

Lines 620 - 700 create a data file that can be READ without causing an END OF DATA ERROR message. The Z variable used at line 680 will be used to tell the READ command how many DATA statements are to be read — in other words, how many entries have been made for mileage and distance. This technique is useful when the number of data entries is constantly changing. If you use the APPEND DOS command for adding new data to your data files, the Z variable can be corrected if you POSITION DOS to location zero and then WRITE in the value of Z and CLOSE the data file. If you are making multiple entries of new data to your data file, I recommend that you not use the APPEND command for writing in data files.

Data Options

After you have run the program and created the data file, the next display on the screen will be CHOOSE YOUR PROGRAM OPTIONS. Lines 200 - 260 allow you to select one of four program



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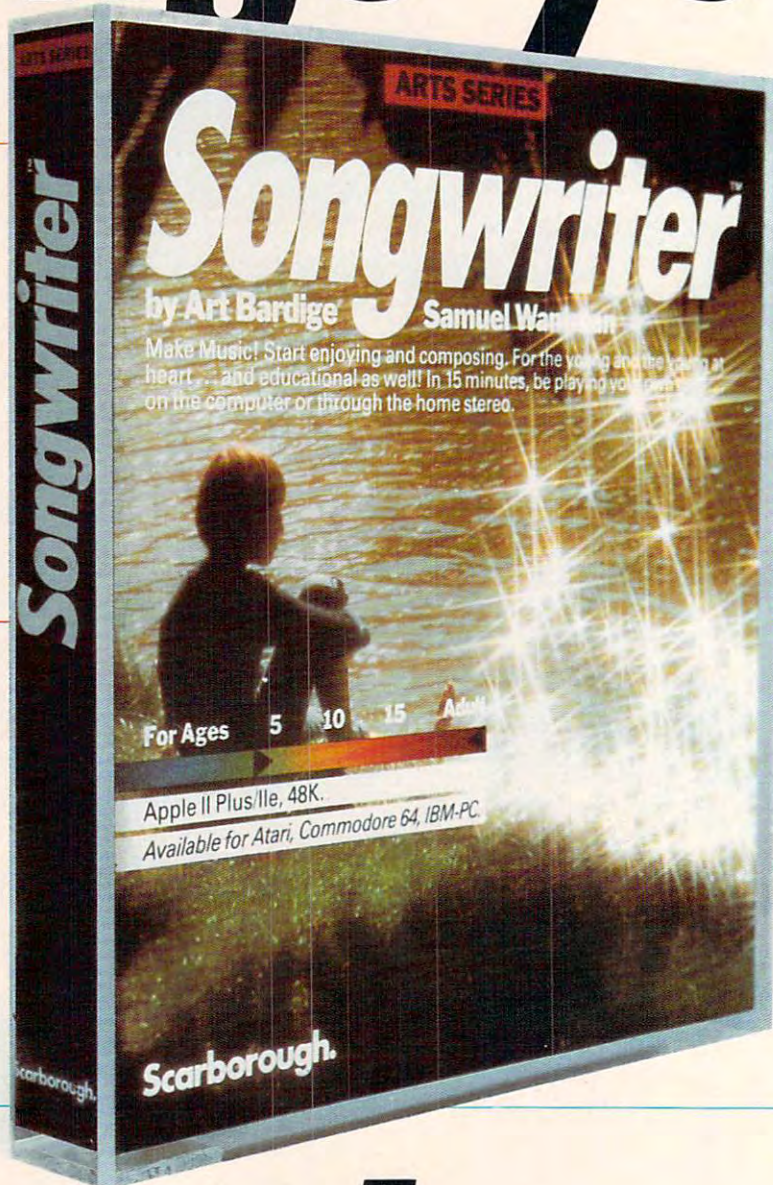
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options:

- (1) DISPLAY GAS MILEAGE
- (2) INPUT NEW DATA
- (3) CREATE BACKUP DATA FILE
- (4) RETURN TO MAIN MENU

I used a GET X\$ request at line 240 and then changed the X\$ to an X variable number. The reason: If a letter is accidentally pressed, the program will crash and you will have to reload your data file.

Since you do not yet have any gas mileage data to be displayed, we'll discuss option 1 last. Option 2, INPUT NEW DATA (lines 490 – 570), lets you input your mileage readings and the amount of gas used to fill the vehicle. The I variable is used as a data interval. Since data is to be added to the data file, the interval variable equals the total current number of DATA statements. The data interval and the Z variable (total number of DATA statements) are then increased by one.

Since the variables used to represent current odometer reading and gas are dimensioned to 200 variable statements each, you should be able to store data representing about 35,000 miles before you will have to increase the number of dimensioned variable statements. Your data will eventually run into the hi-res screen as you run out of memory. You can then create new data files to contain your additional data, or delete parts of the program you find unnecessary.

The screen displays the last stored mileage and asks you to INPUT CURRENT MILEAGE. To get your data file running, your first mileage is used as a starting location and stored as if you'd used no gas, regardless of what you had typed in. (Gas mileage calculations are actually started with your second data entry.) Next, you simply input the odometer reading at the time you filled up your vehicle. For example: 37324 miles, and gas used since last fill-up, 12.3 gallons.

The next screen display (lines 500 – 560) permits correction of an entry before it is stored in the data file:

SUB-MENU

- (1) TO END DATA INPUT & STORE DATA
- (2) TO RE-ENTER LAST DATA ENTRY
- (3) TO ENTER MORE DATA
- (4) TO ENTER REFERENCE DATE FOR FILL UP

Option 2 allows you to correct a mistyped entry. Use option 3 to continue inputting data until you're finished. Option 1 ends data input and stores your data file on disk. Option 4 processes a date for future reference and display. Keep your reference dates to a minimum to save memory.

After the data has been stored in your data file, you are automatically sent back to the program options. After doing all that data entry, you should

now use option 3, CREATE BACKUP DATA FILE.

The Heart Of The Program

When you choose option 1, DISPLAY GAS MILEAGE (lines 270 – 480), the screen display asks you to INPUT ESTIMATED AVERAGE GAS MILEAGE. Your input (XG) is then acted on by lines 270 – 290 and line 440 in adjusting the hi-res screen position of the data that will be displayed. Depending on the individual characteristics of your vehicle, you might like to change the value of the XG variable to position your data display to suit your taste.

The total cumulative average gas mileage is calculated for each input of current mileage and total gas used. The average gas mileage is plotted as a point on the hi-res screen. In addition, gas mileage and standard deviation are provided at the bottom of the screen. When a bell sounds, a new reference date is printed at the bottom of the screen.

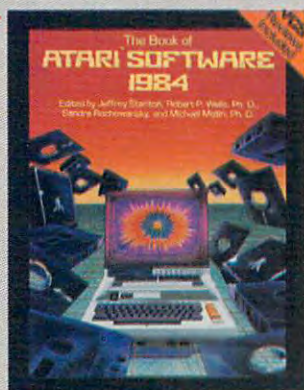
For those unfamiliar with standard deviation, it is a mathematical expression of the variability of data about a mean. The standard deviation can be used to clarify the meaning and the causes of events. The hi-res screen display does for you visually what science relies on statistical analysis to accomplish.

Line 330 is used to increase the data interval by one, so that gas and current odometer readings can be translated and used to calculate gas mileage. X is the total distance traveled, and F is the total fuel used to travel that distance. MG represents the total average miles per gallon. M1 is the total cumulative sum of the squares of miles per gallon, and M2 is the sum of the miles per gallon. Using M1, M2, and N (the total number of entries), the standard deviation is calculated. Lines 350 – 370 carry out these functions.

Line 390 displays at the bottom of the hi-res screen the following: mileage, miles per gallon (MG), and standard deviation (SD). Line 400 displays the reference dates.

Next, each total cumulative gas mileage is translated into a coordinate to be plotted on the hi-res screen at lines 440 – 480. The A variable represents this coordinate. The Y variable is used to position the next graphic plotting of gas mileage slightly to the right of the last gas mileage plotted. The gas mileage is multiplied by the constant provided at lines 270 – 290, and the value subtracted from 600. This enhances graphic display of data and allows for normal graphic display of higher and lower gas mileage as would be expended in the upper-right graphic coordinate system. The hi-res plotting system is in the lower right of the normal graphic coordinate system. Lines 420 and 430 can be changed to stop the erasure of the hi-res screen if your data exceeds the right side of the

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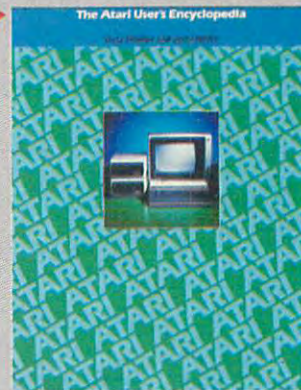
Jeffrey Stanton, a master of 3-D graphics, takes you from game concept through player-missile and character set animation techniques at the machine language level. Stanton also covers BASIC language programming with machine language subroutines, custom display lists,

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Material covers all models except 2600 (VCS) and 5200.

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```

640 PRINT D$;"OPEN";N$;"S DATA"
650 PRINT D$;"DELETE";N$;"S DATA"
660 PRINT D$;"OPEN";N$;"S DATA"
670 PRINT D$;"WRITE";N$;"S DATA"
680 PRINT Z: IF Z = 0 THEN GOTO 700
690 FOR I = 0 TO Z: PRINT D(I): PRINT
G(I): PRINT A$(I): NEXT
700 PRINT D$;"CLOSE";N$;"S DATA"
710 IF BU = 1 THEN BU = 0: RETURN
720 GOTO 200
730 HOME
740 BU$ = "BACKUP ":BU = 1:UB$ = N$:N$ =
BU$ + UB$: GOSUB 620
750 N$ = UB$: GOTO 200
760 HOME : PRINT "PRINTER OPTIONS:"
770 PRINT : PRINT "(1) PRINT MILEAGE A
ND GAS MILEAGE DATA"
780 PRINT "(2) PRINT HI-RES GRAPHICS "
790 PRINT "(3) PRINT BOTH OPTIONS 1 AN
D 2"
800 PRINT "(4) TURN PRINTER OFF"
810 VTAB 1: HTAB 18: GET X$:X = VAL (
X$)
820 IF X > 0 GOTO 840
830 GOTO 760
840 PRZ = X: IF X = 4 THEN PRZ = 0
850 VTAB 10:A$ = "PRINTER OPTION INITI
ALIZED."
860 HTAB (20 - LEN (A$) / 2): INVERSE
: PRINT A$: NORMAL
870 FOR X = 1 TO 2000: NEXT
880 GOTO 50

```

Program 2: Gas Mileage — Atari

```

1 OPEN #1,4,0,"K:"
2 GOSUB 900
5 DIM X$(1),D(200),G(200),A(200),N$(
15),FILE$(15),B(200),C(200),BU$(15
),UB$(15),A$(192)
6 GRAPHICS 0:POKE 752,1
10 POSITION 14,10: ? "GAS MILEAGE"
30 POSITION 7,23: ? "PRESS ANY KEY TO
CONTINUE": GET #1,X
50 POKE 752,1: ? "{CLEAR}": ? "MENU:"
60 ? : ? "(1) GAS MILEAGE DISPLAY"
70 ? : ? "(2) PROGRAM FOR THOSE WANTI
NG A(11 SPACES)PRINTER OPTION"
80 ? : ? "(3) OPTION FOR CREATING A N
EW DATA(8 SPACES)FILE FOR ANOTHER
VEHICLE"
90 POSITION 7,0:GET #1,X: ? "{CLEAR}"
95 X=X-ASC("0"):IF X<0 OR X>3 THEN X
=0
96 POKE 752,0
100 ON X GOTO 120,760,610
110 GOTO 50
120 ? "{CLEAR}": ? : POSITION 2,10: ? "
INPUT CAR'S NAME: ": INPUT N$
130 ? "{CLEAR}": POSITION 2,10: ? "COM
PUTER IS LOADING DATA"
140 FILE$="D:":FILE$(3)=N$
150 TRAP 890:OPEN #2,4,0,FILE$
160 INPUT #2,Z:IF Z=0 THEN 190
170 FOR I=0 TO Z:INPUT #2,Y:D(I)=Y:I
NPUT #2,Y:G(I)=Y:INPUT #2,Y:A(I)
=Y:INPUT #2,Y:B(I)=Y
180 INPUT #2,Y:C(I)=Y:NEXT I
190 CLOSE #2:TRAP 40000
200 POKE 752,1: ? "{CLEAR}": POSITION
2,10: ? "CHOOSE YOUR PROGRAM OPTI
ONS"
210 ? : ? "(1) DISPLAY YOUR MILEAGE":

```

```

? "(2) INPUT NEW DATA"
220 ? "(3) CREATE BACKUP DATA FILE"
230 ? "(4) RETURN TO MAIN MENU"
240 POSITION 31,10:GET #1,X: ? "
{CLEAR}"
245 X=X-ASC("0"):IF X<0 OR X>4 THEN
X=0
246 POKE 752,0
250 ON X GOTO 270,485,730,50
260 GOTO 200
270 ? "{CLEAR}": POSITION 2,10: ? "INP
UT ESTIMATED AVERAGE GAS MILEAGE
": INPUT XG
280 IF XG>=20 THEN XG=20
290 IF XG<20 THEN XG=30
300 I=-1:X=0:N=0:M1=0:M2=0:F=0:Y=0
305 IF PR=0 OR PR=2 THEN CLOSE #3:OP
EN #3,8,0,"E:"
310 IF PR=1 OR PR=3 THEN CLOSE #3:OP
EN #3,8,0,"P:"
315 GRAPHICS 8:COLOR 1:POKE 752,1
320 IF (PR=2 OR PR=3) AND I=Z THEN C
LOSE #3:OPEN #3,8,0,"P:":GOSUB 9
30
330 I=I+1:IF I=Z+1 THEN POKE 656,2:P
OKE 657,0: ? "PRESS ANY KEY TO CO
NTINUE": GET #1,X:GRAPHICS 0:GOT
O 200
340 G=G(I):D=D(I)-D1:D1=D(I):IF G(I)
=0 THEN 310
350 X=X+D:F=F+G:MG=X/F:MG=100*MG:MG=
INT(MG):MG=MG/100
360 MP=D/G:M1=M1+(MP*MP):N=N+1:M2=MP
+M2:M3=M2/N:M4=M1/N:M5=M3^2:SS=(
M4-M5)
365 IF SS>0 THEN SD=SS^0.5
370 SD=100*SD:SD=INT(SD):SD=SD/100
380 POKE 656,0:POKE 657,0
390 ? #3:"MILEAGE=":D(I),"MG=":MG,"S
D=":SD
400 IF A(I)>0 THEN POKE 656,1:POKE 6
57,0: ? #3:"DATE:":A(I):"/":B(I):
"/":C(I):"(5 SPACES)"
410 PLOT 319,159:DRAWTO 0,159
420 Y=Y+2:IF Y>319 THEN Y=0:IF PR=2
OR PR=3 THEN CLOSE #3:OPEN #3,8,
0,"P:":GOSUB 930:CLOSE #3:GRAPHI
CS 8
430 IF Y=0 THEN GRAPHICS 8:POKE 752,
1
440 A=XG*MG
450 A=500-A
460 IF A<0 THEN A=0
465 IF A>159 THEN A=159
470 PLOT Y,A
480 GOTO 320
485 TRAP 500
490 I=Z: ? "LAST STORED MILEAGE: ":D(
I): ? : ? "CURRENT MILEAGE": INPUT
X:D(I+1)=X: ? : ? "GAS USED":
492 INPUT X:D(I+1)=X:I=I+1:Z=I
495 IF LA=1 THEN LA=0:I=I-1:Z=I
500 TRAP 500:POKE 752,1: POSITION 2,1
4: ? "SUB-MENU:"
510 ? : ? "(1) TO END DATA INPUT & ST
ORE DATA"
520 ? "(2) TO RE-ENTER LAST DATA ENT
RY"
530 ? "(3) TO ENTER MORE DATA": ?
540 IF L=0 THEN ? "(4) TO ENTER REFE
RENCE DATE FOR FILL(6 SPACES)UP"
550 POSITION 13,14:GET #1,X: ? :POKE
752,0

```



```

555 X=X-ASC("0"):IF X<0 OR X>4 THEN
X=0
560 ON X GOTO 620,590,600,580
570 GOTO 500
580 ? "{CLEAR}":? "INPUT COMPLETE DA
TE":POSITION 2,5
585 ? "EXAMPLE: 12,3,1983 IS DEC. 3
rd 1983":POSITION 2,10:?"DATE:"
:INPUT A,B,C:A(I)=A:B(I)=B:C(I)
=C:GOTO 500
590 LA=1:POSITION 2,8:GOTO 490
600 ? "{CLEAR}":GOTO 490
610 ? :? :? "INPUT CAR'S NAME:":INP
UT N$
615 IF LEN(N$)>6 THEN ? "NAME TOO LO
NG":GOTO 610
616 Z=0
617 TRAP 890
620 FILE$="D:":FILE$(3)=N$
630 ? "{CLEAR}":POSITION 2,10:?"COM
PUTER IS THINKING"
640 OPEN #2,8,0,FILE$
680 ? #2,Z:IF Z=0 THEN 700
690 FOR I=0 TO Z:?"#2,D(I):?"#2,G(I)
:?"#2,A(I):?"#2,B(I):?"#2,C(I):N
EXT I
700 CLOSE #2:TRAP 40000
710 IF BU=1 THEN BU=0:RETURN
720 GOTO 200
730 ? "{CLEAR}"
740 BU$="BU":BU=1:UB$=N$:N$=BU$:N$(3
)=UB$:TRAP 755:GOSUB 620
750 N$=UB$:GOTO 200
755 CLOSE #2:TRAP 40000:?"INVALID F
ILE NAME":FOR I=1 TO 500:NEXT I:
GOTO 200
760 POKE 752,1:?"{CLEAR}":?"PRINTE
R OPTIONS:"
770 ? :?"(1) PRINT MILEAGE AND GAS
MILEAGE DATA";
780 ? "(2) PRINT HI-RES GRAPHICS"
790 ? "(3) PRINT BOTH OPTIONS 1 AND
2"
800 ? "(4) TURN PRINTER OFF"
810 POSITION 20,1:GET #1,X
815 X=X-ASC("0")
820 IF X>0 AND X<5 THEN 840
830 GOTO 760
840 PR=X:IF X=4 THEN PR=0
850 A$="PRINTER OPTIONS INITIALIZED.
"
860 POSITION (20-LEN(A$)/2),10:?"A$
870 FOR X=1 TO 500:NEXT X
880 GOTO 50
890 CLOSE #2:TRAP 40000:?"INVALID F
ILE NAME":FOR I=1 TO 500:NEXT I:
GOTO 50
900 FOR B=1 TO 61:READ N:POKE 1535+B
,N:NEXT B:RETURN
910 DATA 104,104,141,21,6,104,141,20
,6,104,141,27,6,104,141,26,6,160
,193,173,255,255,136,240,35,141,
255,255,238
920 DATA 26,6,240,21,173,20,6,56,233
,40,141,20,6,144,4,24,76,19,6,20
6,21,6,76,19,6,238,27,6,76,33,6,
96
930 DM=PEEK(88)+PEEK(89)*256:DM=DM+4
0*191
940 LPRINT CHR$(27);"A";CHR$(8):FOR
X=DM TO DM+39
950 A$=CHR$(0):A$(192)=CHR$(0):A$(2)
=A$

```

```

960 W=USR(1536,X,ADR(A$)):LPRINT CHR
$(27);"K";CHR$(192);CHR$(0);A$
970 NEXT X:RETURN

```

Program 3: Gas Mileage — 64

```

5 PRINT"{CLR}{11 RIGHT}{13 DOWN}GAS MILEA
GE PROGRAM"
10 GOSUB4000
20 DIMD(200),G(200)
25 PRINT"{8 UP}";
30 PRINT"{CLR}":PRINT"MAIN MENU":PRINT
40 PRINT"(1)GAS MILEAGE DISPLAY":PRINT
60 PRINT"(2)CREATE A NEW FILE":PRINT
61 PRINT"(3)ENTER NEW DATA IN FILE":PRINT
62 PRINT"(4)EXIT PROGRAM"
70 GETX$:IFX$=""THEN70
71 X=VAL(X$):PRINT"{CLR}"
80 ONXGOTO120,610,652,800
110 GOTO30
120 PRINT"{CLR}":PRINT"INPUT CAR'S NAME:"
:INPUTN$
130 PRINT"{CLR}":PRINT"COMPUTER IS LOADING"
140 B$="0:"+N$+"",S,R"
150 OPEN3,8,3,B$
170 INPUT#3,Z:IF Z=0 THEN 181
180 FORI=0TOZ:INPUT#3,D(I),G(I):NEXTI
181 CLOSE3
190 PRINT"{CLR}"
200 PRINT"CHOOSE YOUR OPTIONS":PRINT:PRIN
T
210 PRINT"(1)DISPLAY GAS MILEAGE":PRINT
211 PRINT"(2)INPUT NEW DATA":PRINT
220 PRINT"(3)CREATE BACKUP FILE":PRINT
230 PRINT"(4)RETURN TO MAIN MENU"
240 GET X$:IFX$=""THEN240
241 X=VAL(X$):PRINT"{CLR}"
250 ONXGOTO270,490,730,30
260 GOTO200
270 PRINT"ESTIMATED GAS MILEAGE":INPUTXG:
X=FRE(0):PRINT"{CLR}"
271 PRINT"INSTRUCTIONS ON GRAPH:":PRINT
272 PRINT"HORIZONTAL:"
273 PRINT"# OF DATA POINTS":PRINT:PRINT:P
RINT
274 PRINT"VERTICAL:"

```

Notes For VIC-20 And 64 Versions of Gas Mileage

The VIC and 64 versions of "Gas Mileage" are very similar to the Atari and Apple versions. However, they do not offer the printer option found in the Atari and Apple versions. The VIC version requires the Super Expander cartridge to plot the graph.


```

275 PRINT"ACTUAL GAS MILEAGE":PRINT:PRINT
:PRINT
276 PRINT"PRESS ANY KEY TO LEAVE GRAPHICS
"
277 FORJ=1TO1000:NEXTJ
280 IFXG>=20THENXG=20
290 IFXG<20THENXG=30
295 POKE53272,PEEK(53272)OR8:POKE53265,PE
EK(53265)OR32
296 SYS49710
300 I=-1:X=0:N=0:M1=0:M2=0:F=0:Y=0
330 I=I+1:IFI=Z+1THEN381
340 G=G(I):D=D(I)-D1:D1=D(I):IFG=0THEN330
350 X=X+D:F=F+G:MG=X/F:MG=INT(100*MG)/100
360 MP=D/G:M1=M1+(MP*MP):N=N+1:M2=MP+M2
361 M3=M2/N:M4=M1/N:M5=M3↑2:SS=M4-M5
362 IFSS>0THENS D=SQR(SS)
370 SD=INT(100*SD)/100
380 GOTO420
381 IFPEEK(197)=64THEN381
382 POKE53272,21:POKE53265,27
383 FORJ=1TO30:NEXTJ:PRINT"{CLR}"
390 PRINT"MILEAGE=";D(I-1)
391 PRINT"MG=";MG
392 PRINT"SD=";SD
393 FORJ=1TO10:PRINT:NEXTJ
394 PRINT"PRESS ANY KEY!"
396 IFPEEK(197)=64THEN396
400 GOTO480
420 Y=Y+10:IFY>319THENY=0
430 IFY=0THENSYS49710
440 A=(XG*MG)
450 A=500-A
460 IFA<0THENA=0
465 IFA>199THENA=199

470 Y=INT(Y+.5):A=INT(A+.5):POKE53240,A:P
OKE53241,0
471 POKE53242,Y:IFY>255THENPOKE53243,1:PO
KE53242,Y-256
472 IFY<255THENPOKE53243,0
473 SYS49408
475 GOTO330
480 POKE198,0:POKE53272,21:POKE53265,27:G
OTO190
490 PRINT"{CLR}":I=Z:I=I+1:Z=I
491 PRINT"LAST MILEAGE WAS=";D(I-1):PRINT
492 PRINT"CURRENT READING=":INPUTD(I)
493 PRINT"GAS USED":INPUTG(I)
494 PRINT"{CLR}"
495 IF I=1 THEN G(I)=0
500 PRINT"SUB-MENU":PRINT:PRINT
510 PRINT"(1)TO END DATA INPUT":PRINT
520 PRINT"(2)RE-ENTER LAST DATA":PRINT
530 PRINT"(3)ENTER MORE DATA":PRINT
550 GETX$:IFX$=""THEN550
551 X=VAL(X$):PRINT
560 ONXGOTO654,590,600
570 GOTO500
590 I=I-1:Z=I:GOTO490
600 PRINT"{CLR}":GOTO490
610 PRINT:PRINT"INPUT CAR'S NAME=":INPUTN
$
630 PRINT"{CLR}":PRINT"COMPUTER IS THINKI
NG"
640 Z=0
650 OPEN2,8,2,N$+"",S,W":PRINT#2,Z:CLOSE2
651 OPEN15,8,15,"IO":CLOSE15:GOTO40
652 PRINT"PRINT CAR'S NAME:"
653 INPUTN$:PRINT"{CLR}"
654 PRINT"{CLR}":PRINT"PLEASE WAIT"

660 A$="@0:""N$+"",S,W"
670 OPEN1,8,9,A$
680 PRINT#1,Z:IFZ=0THEN700
690 FORI=0TOZ:PRINT#1,D(I):PRINT#1,G(I):N
EXTI
700 CLOSE1
710 IFBU=1THENBU=0:RETURN
720 GOTO190
730 PRINT"{CLR}"
740 BU$="BACKUP":BU=1:UB$=N$:N$=BU$+UB$:G
OSUB654
750 N$=UB$:GOTO190
760 GOTO30
800 END
4000 I=49408
4020 READ A:CK=CK+A:IF A=256 THEN 4040
4030 POKE I,A:I=I+1:GOTO 4020
4040 IFCK<>61125THENPRINT"ERROR IN DATA S
TATEMENTS":STOP
4050 RETURN
49408 DATA 173,250,207,141,212,207,173
49416 DATA 251,207,141,213,207,173,248
49424 DATA 207,141,214,207,173,249,207
49432 DATA 141,215,207,173,215,207,74
49440 DATA 141,217,207,173,214,207,106
49448 DATA 141,216,207,173,217,207,74
49456 DATA 141,217,207,173,216,207,106
49464 DATA 141,216,207,173,217,207,74
49472 DATA 141,217,207,173,216,207,106
49480 DATA 141,216,207,173,213,207,74
49488 DATA 141,219,207,173,212,207,106
49496 DATA 141,218,207,173,219,207,74
49504 DATA 141,219,207,173,218,207,106
49512 DATA 141,218,207,173,219,207,74
49520 DATA 141,219,207,173,218,207,106
49528 DATA 141,218,207,173,214,207,41
49536 DATA 7,141,220,207,173,216,207
49544 DATA 10,46,217,207,10,46,217
49552 DATA 207,10,141,210,207,46,217
49560 DATA 207,173,217,207,141,211,207
49568 DATA 173,210,207,10,46,217,207
49576 DATA 10,46,217,207,109,210,207
49584 DATA 141,216,207,173,211,207,109
49592 DATA 217,207,141,217,207,173,216
49600 DATA 207,10,46,217,207,10,46
49608 DATA 217,207,10,46,217,207,141
49616 DATA 216,207,173,218,207,10,46
49624 DATA 219,207,10,46,219,207,10
49632 DATA 46,219,207,141,218,207,24
49640 DATA 173,216,207,109,218,207,141
49648 DATA 208,207,173,217,207,109,219
49656 DATA 207,141,209,207,24,173,220
49664 DATA 207,109,208,207,141,208,207
49672 DATA 169,0,109,209,207,141,209
49680 DATA 207,24,169,32,109,209,207
49688 DATA 141,209,207,173,208,207,133
49696 DATA 251,173,209,207,133,252,173
49704 DATA 212,207,41,7,141,225,207
49712 DATA 56,169,7,237,225,207,141
49720 DATA 225,207,169,0,141,206,207
49728 DATA 56,173,225,207,46,206,207
49736 DATA 206,225,207,16,245,160,0
49744 DATA 177,251,13,206,207,145,251
49752 DATA 96,169,147,32,210,255,169
49760 DATA 0,162,0,157,0,32,157
49768 DATA 0,33,157,0,34,157,0
49776 DATA 35,157,0,36,157,0,37
49784 DATA 157,0,38,157,0,39,157
49792 DATA 0,40,157,0,41,157,0
49800 DATA 42,157,0,43,157,0,44

```



```

49808 DATA 157,0,45,157,0,46,157
49816 DATA 0,47,157,0,48,157,0
49824 DATA 49,157,0,50,157,0,51
49832 DATA 157,0,52,157,0,53,157
49840 DATA 0,54,157,0,55,157,0
49848 DATA 56,157,0,57,157,0,58
49856 DATA 157,0,59,157,0,60,157
49864 DATA 0,61,157,0,62,157,0
49872 DATA 63,232,208,157,169,1,162
49880 DATA 0,157,0,4,157,0,5
49888 DATA 157,0,6,157,0,7,232
49896 DATA 208,241,96,256

```

Program 4:

Gas Mileage — For VIC With Super Expander

```

20 DIMD(50),G(50)
25 PRINT"{8 UP}";
30 PRINT"{CLR}":PRINT"MAIN MENU":PRINT
40 PRINT"(1)GAS MILEAGE DISPLAY"
60 PRINT"(2)CREATE A NEW FILE":PRINT
61 PRINT"(3)ENTER NEW DATA IN{5 SPACES}FI
   LE":PRINT
62 PRINT"(4)EXIT PROGRAM"
70 GETX$:IFX$=""THEN70
71 X=VAL(X$):PRINT"{CLR}"
80 ONXGOTO120,610,652,6030
110 GOTO30
120 PRINT"{CLR}":PRINT"INPUT CAR'S NAME:"
   :INPUTN$
130 PRINT"{CLR}":PRINT"COMPUTER IS LOADIN
   G"
140 B$="0:"+"N$+"",S,R"
150 OPEN3,8,3,B$
170 INPUT#3,Z:IFZ=0THEN181
180 FORI=0TOZ:INPUT#3,D(I),G(I):NEXTI
181 CLOSE3
190 PRINT"{CLR}"
200 PRINT"CHOOSE YOUR OPTIONS":PRINT:PRIN
   T
210 PRINT"(1)DISPLAY GAS MILEAGE"
211 PRINT"(2)INPUT NEW DATA":PRINT
220 PRINT"(3)CREATE BACKUP FILE":PRINT
230 PRINT"(4)RETURN TO MAIN MENU"
240 GET X$:IFX$=""THEN240
241 X=VAL(X$):PRINT"{CLR}"
250 ONXGOTO270,490,730,30
260 GOTO200
270 PRINT"ESTIMATED GAS MILEAGE":INPUTXG:
   X=FRE(0):PRINT"{CLR}"
271 PRINT"INSTRUCTIONS ON GRAPH:":PRINT
272 PRINT"HORIZONTAL:"
273 PRINT"# OF DATA POINTS":PRINT:PRINT:P
   RINT
274 PRINT"VERTICAL:"
275 PRINT"ACTUAL GAS MILEAGE":PRINT:PRINT
   :PRINT
276 PRINT"PRESS ANY KEY TO LEAVE
   {3 SPACES}GRAPHICS"
277 FORJ=1TO4000:NEXTJ
280 IFXG>=20THENXG=20
290 IFXG<20THENXG=30
300 PRINT"{CLR}":I=-1:X=0:N=0:M1=0:M2=0:F
   =0:Y=0
330 I=I+1:IFI=Z+1THEN381
340 G=G(I):D=D(I)-D1:D1=D(I):IFG=0THEN330
350 X=X+D:F=F+G:MG=X/F:MG=INT(100*MG)/100
360 MP=D/G:M1=M1+(MP*MP):N=N+1:M2=MP+M2
361 M3=M2/N:M4=M1/N:M5=M3↑2:SS=M4-M5
362 IFSS>0THENSQ=SS
370 SD=INT(100*SD)/100

```

```

380 GOTO420
381 IFPEEK(197)=64THEN381
382 GRAPHIC0
383 FORJ=1TO30:NEXTJ:PRINT"{CLR}"
390 PRINT"MILEAGE=";D(I-1)
391 PRINT"MG=";MG
392 PRINT"SD=";SD
393 FORJ=1TO10:PRINT:NEXTJ
394 PRINT"PRESS ANY KEY!"
396 IFPEEK(197)=64THEN396
400 GOTO480
420 Y=Y+40:IFY>1023THENY=0
430 IFY=0THEN:GRAPHIC3:COLOR11,6,0,0
431 GRAPHIC3:COLOR11,6,0,0
440 A=XG*MG
450 A=500-A
460 IFA<0THENA=0
465 IFA>1023THENA=1023
470 Y=INT(Y):A=INT(A+150):POINT6,Y,A
475 GOTO330
480 POKE198,0:GRAPHIC0:POKE36879,190:GOTO
   190
490 PRINT"{CLR}":I=Z:I=I+1:Z=I
491 PRINT"LAST MILEAGE WAS=";D(I-1):PRINT
492 PRINT"CURRENT READING:":INPUTD(I)
493 PRINT"GAS USED":{7 SPACES}INPUTG(I)
494 PRINT"{CLR}"
500 PRINT"SUB-MENU":PRINT:PRINT
510 PRINT"(1)TO END DATA INPUT":PRINT
520 PRINT"(2)RE-ENTER LAST DATA":PRINT
530 PRINT"(3)ENTER MORE DATA":PRINT
550 GETX$:IFX$=""THEN550
551 X=VAL(X$):PRINT
560 ONXGOTO654,590,600
570 GOTO500
590 I=I-1:Z=I:GOTO490
600 PRINT"{CLR}":GOTO490
610 PRINT:PRINT"INPUT CAR'S NAME:":INPUTN
   $
630 PRINT"{CLR}":PRINT"COMPUTER IS THINKI
   NG"
640 Z=0
650 OPEN2,8,2,N$+"",S,W":PRINT#2,Z:CLOSE2
651 OPEN15,8,15,"IO":CLOSE15:GOTO40
652 PRINT"PRINT CAR'S NAME:"
653 INPUTN$:PRINT"{CLR}"
654 PRINT"{CLR}":PRINT"PLEASE WAIT"
660 A$="@0:"+"N$+"",S,W"
670 OPEN1,8,9,A$
680 PRINT#1,Z:IFZ=0THENGOTO700
690 FORI=0TOZ:PRINT#1,D(I):PRINT#1,G(I):N
   EXT I
700 CLOSE1
710 IFBU=1THENBU=0:RETURN
720 GOTO190
730 PRINT"{CLR}"
740 BU$="BACKUP":BU=1:UB$=N$:N$=BU$+UB$:G
   OSUB654
750 N$=UB$:GOTO190
760 GOTO30
6000 OPEN15,8,15
6010 INPUT#15,A$,B$,C$,D$:PRINTA$;B$;C$;D
   $
6020 CLOSE15
6030 END

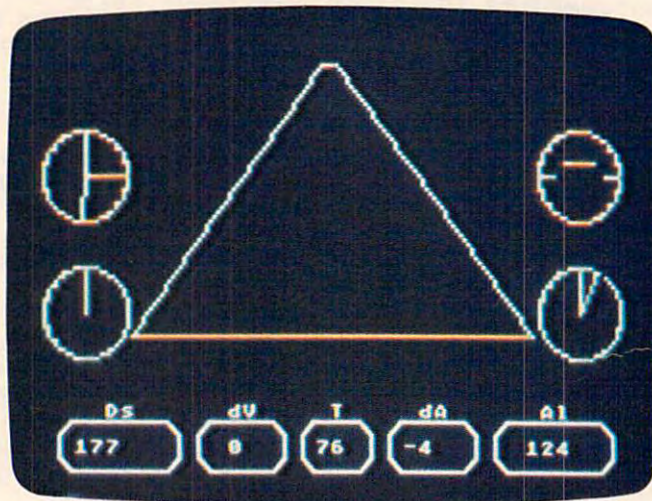
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COMPUTE! Books

Nightflyer

David J. Bohlke

You have just assumed control of a light plane in the dead of night, and all you can see is your glowing instrument panel and the faint runway lights in the distance. Will you be able to safely land the plane? Yes, but you'll need pinpoint control and some tricky maneuvering. Written for the Atari (joystick required), and Apple version (joystick or paddles) is included.



Successfully landing your aircraft takes careful navigation. "Nightflyer," Atari version.

Reading The Instrument Panel

For a safe landing, you'll have to quickly and accurately interpret your instrumentation. The dial on the left center of the screen shows your velocity. Straight up is zero, and the marker at 90 degrees right is the 80 mph indicator. If

your velocity dips below 80 mph before you touch down, the plane will stall and crash.

Below the velocity dial is a distance dial with a distance (DS) digit readout. After touchdown, this readout will reset to indicate the distance to the end of the runway.

On the right center of the screen is your glide path dial. You are on the glide path when the orange line is in between the two markers. Below this dial, on the lower right, is an altitude dial with a digital readout (AL) right underneath. Your altitude must remain above 30 feet before you reach the end of the runway, or else you'll crash into the runway lights.

There are three other digital readouts on the

"Nightflyer" is a flight simulation game in which you control your joystick to land your plane. It's night and all you can see are your instrument panel and the distant lights of the runway.

To begin, you will need a joystick in Slot 1 of the Atari. The instructions will ask you to pull the joystick down for a Standard start or push it up for a Random beginning. The Standard start will position your plane on the glide path 20000 feet from the runway with an altitude of 1200 feet. The Random start will be more difficult as both distance and altitude will be randomly assigned.

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