

# Enthusiast 99

OFFICIAL PUBLICATION OF THE INTERNATIONAL 99/4 USERS GROUP

MAY, 1983

Vol. I, Number 1

International  
99/4  
Users Group



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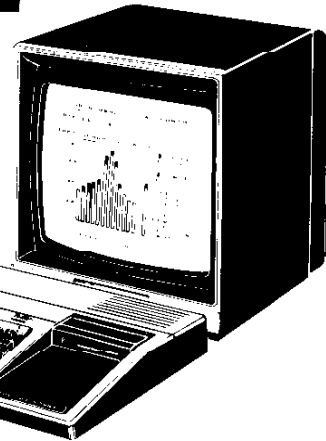


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# OVERVIEW

## Enthusiast '99

### NEWS BYTES

**MEMBER SPOTLIGHT** Rick Stickle

**A WOMAN'S VIEW** Regena

### BESTSELLERS

### POTPOURRI

**SOFTWARE** **Microsoft Multiplan** Wayne Wright

**Library Corner** Guy S. Romano

**Extending BASIC** John Phillips

**Basic BASIC** Regena

**ASSEMBLY LINE** **Benchmarks** Bill Gronos

**USERS GROUP SPOTLIGHT** **Washington, DC** Steve Meyers

**RETAILERS SHOWCASE** **Entre Computer Center** Brian Gratz

**CHARLIE'S PAGE** Charles LaFara, President 99/4 IUG

3

4

6

8

9

10

11

13

19

24

33

35

36

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## ABOUT THE COVER

The Joe Mills cover photo of TI holding the winning hand at the Black Jack Table clearly depicts what is happening in the personal computer industry today. Gambling that lower console prices and an upcoming robotic program will increase the overall profits of the entire line, TI is putting all of its chips on the table to stay on top in this highly competitive game.

In recent weeks, experts in computer merchandising and Wall Street analysts have all agreed that Texas

Instruments is currently leading in total sales of personal computers priced under \$500. Many analysts predict that this bold price cutting move by Texas Instruments could sell as many as 2,000,000 additional consoles for them prior to January of 1984.

Additional marketing strategies planned by Texas Instruments including promotion geared at the Peripheral Expansion System and its components, have most experts believing that TI is playing with a stacked deck.

# NEWS BYTES

## SOFTSEL & TI SIGN AGREEMENT

Over 40 software packages designed for the just-announced Texas Instruments Professional Computer System are already in stock at computer retail outlets nationwide, the result of an exclusive pre-introduction distribution agreement between TI and Softsel Computer Products, Inc.

As TI was announcing its new 16-bit system in New York, Softsel, the world's largest distributor of personal computer software, was ensuring that all third party software for the Professional Computer would be stocked in retail computer stores and available to

customers the same day, according to Robert S. Leff, Softsel president.

Some of the industry's leading software publishers also participated in the TI announcement by having adapted their accounting, spread sheet and other business-oriented products to operate on the new system and by having shipped in quantity to Softsel a week prior to the announcement. These include Ashton-Tate, Digital Research, IUS, MicroPro, Peachtree, Software Publishing and Sorcim. Softsel has already delivered many of these programs to close to 100 computer retail stores.

## TI GOES TO MAGIC MOUNTAIN

Six Flags Magic Mountain, Valencia, CA, is the latest amusement park to announce a computer center on-site. This time it's the Computer Discovery Center, offering forty Texas Instruments 99/4A home computers. Software will be organized by age — from children to adults, and by sex as well. The center will also feature a short film narrated by TI spokesman Bill Cosby on computers and their place in contemporary life.

## THE ORACLE AT DELPHI NOW OPEN

The nation's newest videotex operation, Delphi, is now on-line, reports General Videotex Corp. of Cambridge, MA. The service can be accessed through Tymnet and the system's own DELPHInet network. The service is offered expressly for personal computer users, General reports, with a wide range of services ranging from information access to electronic mail.

## BE TRUE TO YOUR SCHOOL

The increasing use of microcomputers in schools may endanger legal challenges from poorer school districts in the future, reports International Resource Development in Norwalk, CT. If the image of the computer as an "advantage" for students persists, the report continues, then the school districts that can't afford to purchase them in significant quantities will be left even further behind in the "knowledge gap." With parents as a funding source for micros, the report says, the richer school districts are likely to find more funds available for micro purchases than poorer districts which are dependent upon government financing.

## MAXELL MOVES UP TO NUMBER TWO

Maxell Corp. of America reports that its Computer Products Division doubled its sales of floppy disks in 1982 — making it the number two company for sales of magnetic media in the U.S. The firm adds that total floppy disk sales will continue to grow at an exponential rate, aided by the continued acceptance of the 96TPI double-sized 5¼" disks, as well as the new generation of 3" micro-floppy disks.

## TALK TO MY AGENT, PLEASE

It had to happen at some point. John Brockman Associates, Inc., a New York literary agency, has announced its entrance into the software field, to represent software authors and publishers. The firm will also represent more than 200 non-fiction book authors currently on its roster, in developing software products based on their special information and expertise. It will be interesting to see how this concept fares, since many (if not all) independent software authors to date have essentially had to enter into publishing agreements with publishing firms on a one-to-one negotiation stance. The firm will also represent software publishers, in the fields of cross-licensing, co-publishing, or joint ventures.

## TYMNET DIALS UP

Tymnet, Inc., one of the major carriers of computer communications for a variety of services, will expand its packet switch network to a total of 400 cities by midyear. The system will also be upgraded in all areas in terms of access ports and high-speed ports. A total of five million potential new computer customers will be added to the Tymnet capability as a result of the expansion.

## E.T. AND MECC PACKAGES CANCELLED

Unconfirmed rumors from Lubbock are circulating that TI has cancelled the production of at least one Command Module, E.T. The Extra-Terrestrial and an entire series of disk based educational programs. When contacted by the IUG a TI spokesperson said, "The MECC educational series adds little value to our line and in fact duplicates some software we currently have in place. It is also available for other personal computers and does not seem to be selling all that well."

The decision to scrap E.T. apparently comes from the fact that Atari was able to upstage TI with the release of an E.T. Module for their Video Game Machine.

# MEMBER SPOTLIGHT



by **Richard Stickle**  
335 'N' St. S.W.  
Washington, D.C. 20024

I have heard that TI users are very diverse and I do my best to keep the myth alive. I work for the U.S. Army and I'm currently stationed at Fort Meade, Maryland. My job is bomb disposal, or to put it in the Army's terms, I'm Sr. Supervisor of an Explosive Ordnance Disposal detachment. Being in the Washington, DC area adds a little interest to the job since part of the job is to aid other federal agencies in the protection of various dignitaries, both ours and foreign visitors. Having been here since 1971, with a one year break in Korea, I've managed to work with 4 Presidents now and numerous heads of state from other countries. In my spare time I have been certified as an EMT by the State of Maryland and also a CPR instructor. In the last 10 years I've worked at obtaining a BS in Psychology from the Univ. of Maryland and an MS in Safety from USC. I've also taught college and frequently teach both bomb threat and explosive safety classes to both military and civilian agencies in the local area. For sports I ride a bicycle when time allows.

My wife tells me that I have two major faults. The first of these is that I'm a habitual reader, I can easily go through a book a week. I read mostly history and fiction. (Authors take note, write FASTER!) My other problem is that I'm a sucker for anything electronic. While I was teaching college I put all of my teaching earnings into a stereo system. I can mix, match, and dub right from my living room. The biggest weakness I have is for electronic "toys" that "think"! I turned in my slide rule in 1970 for an advanced TI SR-10 that had 4 function

math and did square roots, and it was only \$99.95.

As I progressed to my bachelor's degree TI managed to keep pace with my needs. They had the SR-11, TI-50, TI-52, and the TI-59 (and so did I). Having received my bachelor's I took some time off from school and did a little traveling at government expense. Korea is such a relaxing place to spend a year. I returned at the end of 1979, started looking at graduate school and in the spring of 1980 the fates stepped in. I received this flyer from TI "since you are such a good consumer . . . TI 99/4". Well the results were predictable. I had two children starting school, my wife was starting to work her way to an accounting degree, and I was starting graduate school. My wife's enthusiasm was unbounded. ("you want a WHAT?") After much talking I finally got the OK to order the computer for "the kids" so in typical TI fashion I received my Speech Synthesizer in April and my console and color monitor (for only \$1045) in May of 1980.

**I had two children starting school, my wife was starting to work her way to an accounting degree, and I was starting graduate school. My wife's enthusiasm was unbounded. ("you want WHAT?")**

Like everything else at the beginning, it was rough. I didn't know anyone with a computer and spent a lot of my time trying to program things from various sources. I learned lessons the hard way, just little things, like BASIC is not standard! I spent those first months learning to translate different versions of BASIC so that I could enter programs from magazines. As I started back to school the world of statistics grew in importance. I had six hours of statistics to take for my master's and since I had done so well in stat before ("C") I realized I needed help so I bought TI's Statistics Module. Unfortunately, it turned out to be worthless for most of my needs so I had to write my own (some even worked).

It was about this time that things finally started to move. I got a letter from a guy named LaFara who lived in "Noplace, Oklahoma" (or something like that) who was starting a users group. I joined. A friend looked at my TI and

laughed, but he did tell me about the Source, and the fact that they had more statistics than I could ever use, so out came the charge card and the system became richer by the addition of the RS232, modem, and of course the Terminal Emulator II. This foolishness was quickly followed by joining MicroNet (urge to listen to the world).

**Don't let anyone tell you having a computer isn't like having another child. They, like kids, always need something new.**

September 80 turned out to be a good month, I got a newsletter from Chafitz, they were going to start a users group right here in the Washington area, could I come? Stupid question! I arrived at the appointed hour and what a crowd we had, 2 Chafitz employees and 5 users. I guess all good things start small. We have managed to grow a little bit since October 80 (now about 600 paid members).

Needless to say, in the past couple of years my system has continued to grow. Don't let anyone tell you having a computer isn't like having another child. They, like kids, always need something new. Just when you think that you're set, here comes Extended BASIC, or how about that new game that looks so great. In the meantime don't forget the hardware side, look!, there is a 32K RAM expansion. I don't think I can continue using this cassette recorder forever. I'd better start looking for a disk.

This is where I was when the Expansion Box was released, so you start all over. Well, I did and now my system consists of the console, monitor, and expansion box which contains a 32K Ram, RS232, p-Card, Disk Controller, and disk. I can't complain (they won't let me!) in my family of 4 every member uses the computer for something.

The biggest use I found for the computer was while I was in school. I managed to take care of all of my statistics plus there were courses in systems, engineering, human factors, and industrial hygiene. All of these courses required work with different types of formulas which could be programmed as my experience grew. Sometimes I found the work had been done for me like the IUG having the programs I needed for P.E.R.T. and CPM. When it came time to do papers I could always look to the

Source and use their data bases and the UPI to get the latest information on any subject and also check all of my figures prior to doing the final paper.

My wife Judy, the future accountant, is the holdout of the family. I had thought that she would jump at the idea of a computer to do the accounting that she is learning. Would you believe that she is the game person in the house? She loves to play the new games, she watches me until I get bored then has me explain the game to her — then she beats the pants off me.

The oldest daughter, Dara, is the big user. She plays all the games. Her demise was "Adventure," she doesn't have the logic for it yet (neither do I) but will try for hours. Dara does more than play games, she has used the computer to good advantage to help her with school. By using modules like Number Magic she improved her math ability. Now she is starting to get into LOGO and is using the Typing Tutor in hopes that I will let her use TI-Writer to do her school papers. Naturally she had no problems with her Girl Scout Computing Merit Dadge.

My younger daughter, Danette, started on Early Reading prior to starting school so she was the only kid in her kindergarten class that could read. She also picked up a lot of the math by watching her big sister. When she is not "playing" with Multiplication I these days she is playing Hunt The Wumpus, which for some reason she still loves.

**My younger daughter, Danette, started on Early Reading prior to starting school so she was the only kid in her kindergarten class that could read.**

Things have quieted down a lot in the past six months. I now have my degree, so now I spend most of my time at the computer translating a three inch stack of programs that I have managed to collect from magazines over the past two years.

Another thing that I've been able to do since finishing school is devote more time to the Users-Group here in the area. Last fall I was able to run the booth that the Club got at The Mid-Atlantic Computer Show. I found the job both fun and satisfying since it enabled me to meet and talk to hundreds of other computer owners.

I think the most surprising thing at that time was the number of people that were shopping for a computer and had never seen the TI. The four days that the show ran enabled our group to double in size, and it also pointed out to

software dealers that there are people looking for third party software. Another exciting thing that showed up was the fact our booth was approached by two publishers, Brady and Compute Magazine. Both of the publishers expressed a need and desire for more information about our computer.

**I've found that having friends buy TI's and ask for help has been the best way to improve my own programming abilities.**

I think another thing that is important is the people that are new to computing. I've found that having friends buy TI's and ask for help has been the best way to improve my own programming abilities. As I said before, most of my programming was in statistics. Well, very few of my friends care about them, so I started getting questions on how to do data files and how to set up business programs. The effort to help these people has probably helped me more than them in most cases since it added to, and broadened my knowledge.

In the future as more time becomes available to me I hope to be able to

devote more time to helping the local Users-Group. The military job I have still makes large demands on my time, but with retirement in the near future and the hopes of closer to normal work hours I want to assume a more active part in the group. The only thing I have been able to do thus far is head the on-line special interest group and help with some of the committees. I also want to see both of my children become computer literate, so I intend to try to keep expanding my system to its limits, (or at least to the limits of my wife's patience).

**I also want to see both of my children become computer literate, so I intend to try to keep expanding my system to its limits, (or at least to the limits of my wife's patience).**

As for me personally, I plan to go on writing programs for work and any other reason I can think of as the need and desire arises. As for the expansion of my system, I can't really answer that. The expansion depends on the people at TI and hopefully, third party hardware producers. If I see something I can use I'll probably put it into the system.

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# A WOMAN'S VIEW

## Regena

P.O. Box 1502  
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The original home computer market targeted as "hobbyist" people who liked to tinker with electronic devices. Many early computer owners actually built their own peripherals or even their own computers. Each person also usually did his own programming. Notice I used the word "his". Yes, most of the computer owners were men.

Times have changed, computers have changed, and the home computer market has changed. The target consumer now is the non-technical user. The home computer is made for men, **women**, and children. The TI-99/4 and TI-99/4A home computers were specifically designed for **home** use. The computers were designed to take hard use by children playing computer games. The computers were designed to be easy to use (user-friendly) so beginners could learn about computers easily. The computers were even designed to be compact enough to be set up with a regular television and used in the kitchen.

I like to compare using a computer with using a television. You do not need to know how to build a television in order to enjoy it. You do not need to know the history of television. You do not need to know about tubes and switches and circuits and wiring to enjoy a TV. You do not need to know how to write a script, how to film, or how to produce a show to enjoy the TV. What you **do** need to know is how to read a television schedule to know what programs are available, and you do need to know how to turn the TV on and switch channels to get the right program.

**I like to compare using a computer with using a television. You do not need to know how to build a television in order to enjoy it.**

Likewise, to enjoy your computer you do **not** need to know how to build one. You do not need to know the history of computers. You do not need to know about bits and bytes and circuits and all those little silver and green things inside the computer in order to enjoy your computer. You don't need to know how to write programs to

## **What you do need to know is how to read a television schedule to know what programs are available.**

enjoy your program. What you **do** need to know is what "software" or programs are available for your computer, and you do need to know how to turn the computer on and how to load a program.

Too many "Introduction to Computers" and "Microcomputers in Education" classes dwell too long on the history (Hmmm, I never did like history classes) then delve into bytes and RAMs and ROMs and microprocessors and a bunch of confusing numbers. My **personal** opinion is that introductory courses should expose students to a variety of ways they personally can use their computers in any major field of study. Education classes could offer suggestions to teachers about how to implement computers as teaching aids or learning tools of the classroom. (And now I better get off this subject before all the college curriculum committees yell at me!)

I'd like to offer you a few suggestions about how women or house-husbands can use a computer in the home. The easiest way to load a program on the TI-99/4A is to plug in a pre-programmed command module. Turn on your TV or monitor and the computer. Select the module, then insert it at the right side of the keyboard. Push it in until it locks. Push any key to start. On the TI-99/4A push 2 to select the module, and on the TI-99/4 push 3 to select the module. NOTE: Some of the modules have different languages, so select the appropriate number.

Following is a brief overview of some of the modules you might use in your home.

First, to buy your home use Home Financial Decisions. I recently moved into a new home and used this module to tell me how much my monthly mortgage payment would be for a specific amount of money borrowed at a certain interest rate. I could easily compare different interest rates or different amounts of principal. You may use this module for any kind of loan. It also can compare car loans or house loans, and whether it is better to buy or rent.

Personal Real Estate is a module designed for real estate agents. You may evaluate different personal real estate investments.

After you're in your home you can keep track of a budget with Household Budget Management. Set up a monthly budget with pre-programmed categories or use your own. Each month enter your income and expenses for evaluation. You will need a cassette recorder to keep the data.

Personal Record Keeping is a versatile module for you to keep any type file from names and addresses to your home business. You can store data on cassettes and even make printed copies of reports.

Let's go to the kitchen. Weight Control and Nutrition can help you plan your meals. First enter such items as height, age, and level of activity. You will be told your recommended weight and caloric requirements. Then you can plan weekly menus that are nutritious and guide you toward your target weight.

If you find you need to diet, use the Physical Fitness module to plan an exercise program. You can do exercises right along with the computer and keep track of your progress.

Do you enjoy art? Use Video Graphs to create designs. This module shows what you can do with computer art without knowing programming. You can even create patterns for quilt designs.

## **One of the main applications the TI excels in is teaching your children.**

Use Music Maker to learn about music. You don't even need to know how to read notes to experiment with tones to learn what going higher or lower sounds like. If you are a musician, you can use this module to compose music.

When you need a respite, there are a variety of games for the TI. You have your choice of thinking games such as Chess and Hunt the Wumpus or Adventure games, or arcade-type games such as TI Invaders and Parser.

I haven't mentioned education yet, but one of the main applications the TI excels in is teaching your children. Scott, Foresman and Company offers command modules for a complete courseware series in math and reading for beginners up to sixth grade level.

If you feel home-bound and want a line to the outside world, you can get a telephone modem, the RS-232 Interface, and the Terminal Emulator II command module to directly access a larger computer, another TI, or a database service. You can research information about a certain subject, you can find out



the latest sports news, you can get the current Dow-Jones information, or you can communicate with a friend across the country. The possibilities are limitless.

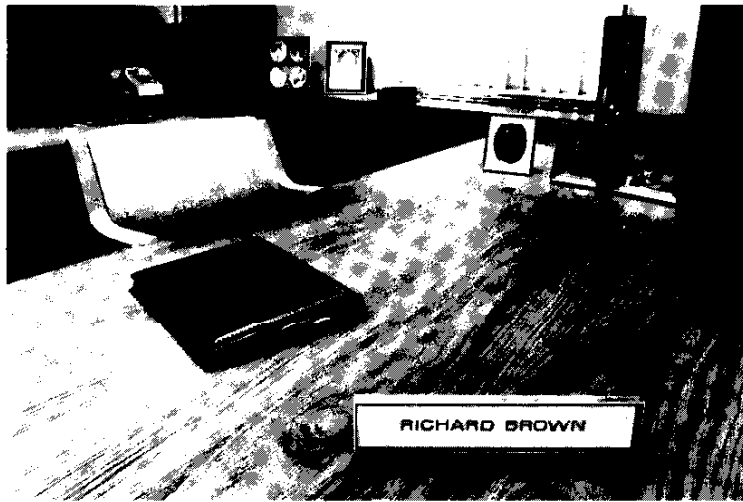
Command modules are not the only way to load programs onto your TI. You may load a program from cassette or diskette. For a cassette-based program you will need a cassette recorder and a cassette cable that hooks your computer to the cassette recorder. For a diskette-based program you will need at least one disk drive plus the disk controller (and thus the Peripheral Expansion Box if you are using the "new" expansion system). Take a look at the Users Group catalog to see hundreds of programs available on cassette or diskette. You can see the variety of applications possible.

One more way to load a program into the computer is to type it in. Don't worry — you still don't need to be a programmer if you don't want to. Several books and periodicals such as this publication contain actual program listings that you can type in (then save on your own cassette or diskette). Again, there are a lot of programs that have been published. Before you start typing, be sure that the program has been written for the TI. Also make sure that you have all necessary peripherals for the program to run. For example, your TI console contains TI BASIC. Some action games may require the TI Speech Synthesizer and probably the Terminal Emulator II command module. The program description or first few lines of the program should tell you if you need anything besides your basic console.

**I think the best way to get started is to go through the blue "Beginner's BASIC" manual that comes with the TI.**

Eventually you may want to write your own programs like I do (See Cookie File Page 19) or you may want to adapt someone else's program to fit your own needs. I think the best way to get started is to go through the blue "Beginner's BASIC" manual that comes with the TI. Typing in published programs helps you learn new techniques. Another way to learn is to LIST programs you have purchased — or ordered from the Users Group. My next article will discuss a little more about programming, plus a variety of job opportunities for women using computers.

## Richard Brown thought he was too young to have a heart attack. He wasn't.



Because having a family, a good job and a bright future doesn't protect anyone from heart attack. In fact, nearly one million Americans — many with those assets — die of heart disease and stroke each year. And 200,000 of them die "too young."

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# BEST SELLERS

## TEXAS INSTRUMENT & THIRD PARTY SOFTWARE

Based on purchases  
By IUG members  
from Feb. 19, 1983

### EXTENDED BASIC

Programming language compatible with TI BASIC which includes enhancements such as: multi-statement lines, IF-THEN-ELSE-statements, direct screen accessing, output formatting with "using" clause, and easily programmed character sprites.

### TERMINAL EMULATOR II

Links your 99/4 to the telecommunication world — accessing subscription data service and time shared computer systems. Also incorporates full text speech which can be used to enhance user-written programs or certain TI and third party software packages.

### PARSEC

Players battle alien ships on a planet in outer space. The aliens attack in waves of different battleships as the player guides his command ship through deep space. Vivid graphics and digitized speech.

### MINI-MEMORY

A solid-state command module that provides additional memory for your system as well as important tools for programming development. This module contains a total of 14K bytes of memory; 6K bytes of (GROM), 4K bytes of (ROM), and 4K bytes of (RAM).

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A one or two player game of skill and challenge. There are a total of six mountains to climb and climbers must face different hazards such as rockfalls, forest fires, and avalanches.

## USER-WRITTEN SOFTWARE

### 1132 MINER

Prospect for gold in underground mine while eluding floods and cave-ins. Bank your money and achieve the glories of wealth.

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A file keeping system for your personal records. Files can be saved and read from tape, and editing and search capabilities are included.

### 1004 CARS AND CARCASSES

A game in which you must destroy villainous monsters with your car while driving through the forest. Excellent graphics.

### 1237 PARTY GAME

An adult board game designed to be used by our more mature members. For use with TI 99/4A only.

### 1224 SPACE COMMAND (EXTENDED BASIC)

While destroying enemy spacecraft to defend our galaxy you must maneuver your ship with calculated caution. Hi-Res Graphics and total use of TI 99/4A capabilities add excitement to this program.

### TOUCH TYPING TUTOR

Teaches the beginning typist to touch type using the TI 99/4A keyboard. Also helps the reviewer to improve speed and accuracy at touch typing. Includes lessons covering letters, numbers and symbols; a diagnostic section with word-per-minute (WPM) timing; individual keystroke analysis and practice; and a practice game to improve typing speed. TI 99/4A only.

### TUNNELS OF DOOM

A role playing adventure that stimulates your imagination and challenges your survival instincts.

### PERSONAL RECORD KEEPING

Create, maintain and utilize a computer-based filing system that's useful and convenient for a variety of applications — including home inventory for insurance purposes, car maintenance records, medical and dental records, and a complete reference medium for birthdays, anniversaries and other important occasions.

### WIZARDS DOMINION (ASD&D)

Only the Wizard's Apprentice, the Evil Wizard, the Hero and the Evil Prince have enough courage to defeat them and rule Wavoria. Inside the caverns of the Wizard's Dominion lay gold, adventure and magical powers.

### ARTHROPOD (BIES) E/A version

A "CENTIPEDE" look-alike which contains all of the action and speed of the coin-op version. Vivid graphics.

### 4359 COLOR FRACTIONS

A very educational program which is to be used for teaching elementary grade level students how to use fractions. Highly colorful.

### 1242 ALIEN DESTROYER (EXTENDED BASIC)

Exceptional speed and visual effects make Alien Destroyer a SUPER game.

### 7006 MAILING LIST

A very good cassette based data manager which allows you to add, delete, search, and update information.

### 5418 WORD PROCESSING

A simple yet efficient cassette program to utilize your computer as a word processing machine. RS232 and printer are recommended.

### 7027 HOME CHECK PROCESSOR

This program allows the user to file, sort, add and manipulate all of your home checking chores. The menu driven format makes it easy to operate.

# POTPOURRI

## GINGRICH REINTRODUCES "COMPUTER HOMESTEAD ACT"

Families who are willing to work and learn can become part of the "Information Revolution" if the Family Opportunity Act passes, according to its author, Rep. Newt Gingrich (R-Ga.).

The bill, first introduced last May in the 97th Congress and reintroduced today for the 98th, would grant a \$100 tax credit each year for every family member when that family buys a personal computer. The family could use the credit every year for five years or until the total credit equals half the purchase price of the computer or accessories.

"Just as the Homestead Act helped accelerate the settlement of the American West, the Family Opportunity Act will speed up the 'settlement' of the computer frontier," Gingrich said.

The Homestead Act of 1862 granted 160 acres to farmers who were willing to settle on and work their plot of land. Along with a series of similar laws, the Homestead Act gave incentives to people to move West without complex government regulations. And it helped individual farmers by giving them the chance to own their own means of making a living.

"Working Americans should get the same opportunities computers provide for General Electric and A I & T," Gingrich said. "They need the same kind of tax breaks corporations get automatically. We can't allow the computer to widen the gap between the rich and those working to become better off. Instead, computers can help us close that gap for those willing to work at it."

Gingrich designed his bill to encourage more families to work and learn together at home. But the ease of learning with computers could make this a "jobs bill" if it helps workers displaced by modern technology to retrain themselves for the new jobs that are in demand.

The estimated 15 percent of the public that is physically handicapped would be able to work and learn more easily with a home computer, too, Gingrich said. "Computers are color blind — to a computer there are no race barriers, no physical limitations, and no time constraints," he said. "The whole country benefits when we can all become productive through the most advanced technology."

## EDUCATIONAL SOFTWARE SALES

Future Computer sees a billion dollar market for educational software by 1987, according to a new study by that research firm. That figure is based on a compound annual growth rate of 71 percent of 1982's \$70 million market. The firm's 1982 firm figure was 2.4 million, expected to rise to 34 million by 1987. Future thinks 70 percent of these sales will be to home users, "spearheaded by a new group of games that will both entertain and instruct."

Software publishers estimated that Texas Instruments led all educational publishers in 1982 with sales of nearly \$6 million followed closely by Radio Shack and Atari. Apple Computers educational software estimates were given as nearly \$4 million with the fourth place finisher in this category being Eduware at just over \$1 million.

Portia Isaacson, president of Future Computing, says opportunities in this field for software authors and publishers are "excellent today because the market is relatively new." The company is headquartered in Dallas, Texas.

## TI REACTS TO IBM PRICE CUT

Texas Instruments, Inc. has launched a short-term program under which its Professional Computer dealers will have the chance to offer their customers a 256k-byte system for the same price as its 64k-byte system.

A 256k-byte system under the program will sell for \$2595. Previously, the 256k-byte expanded memory option sold for an additional \$700. The price reduction represents a savings of more than 20 percent to end users.

Many dealers said they hope this is only the first of Texas Instruments' steps to widen the price spread between the PC and the Professional.

A reduction in the dealer cost on the 256k-byte memory option was made available to all dealers, and it is up to the dealers to pass on the savings to their customers, according to a TI spokesman. TI will promote the program with Wall Street Journal advertisements throughout the plan's duration.

## NEW TI PROMOTION OFFERS FREE P.E.B.

Texas Instruments has just announced a new dealer promotion that allows consumers who purchase selected hardware or software products to receive a free Peripheral Expansion Box. The promotion which began Monday, April 25, 1983, states that if the consumer purchases any three of the following seven items that he will receive a free Peripheral Expansion Box directly from the dealer.

- PHP 1220 — RS232 Card
- PHP 1240 — Disc Controller Card
- PHP 1250 — Disc Memory Drive
- PHP 1260 — 32K Memory Expansion Card
- PHP 1270 — p-Code Card
- PHP 3111 — TI-Writer
- PHM 3113 — Microsoft Multi Plan

Currently no date has been announced for the expiration of this promotion and it is valid at all participating TI dealers including the International 99/4 Users-Group.

# SOFTWARE

## MICROSOFT MULTIPLAN

by Wayne Wright

18103 Banbridge Houston, TX 77090

Multiplan is finally here for the TI 99/4A. We have been waiting a while for it and now we can have a chance to see just what it can do.

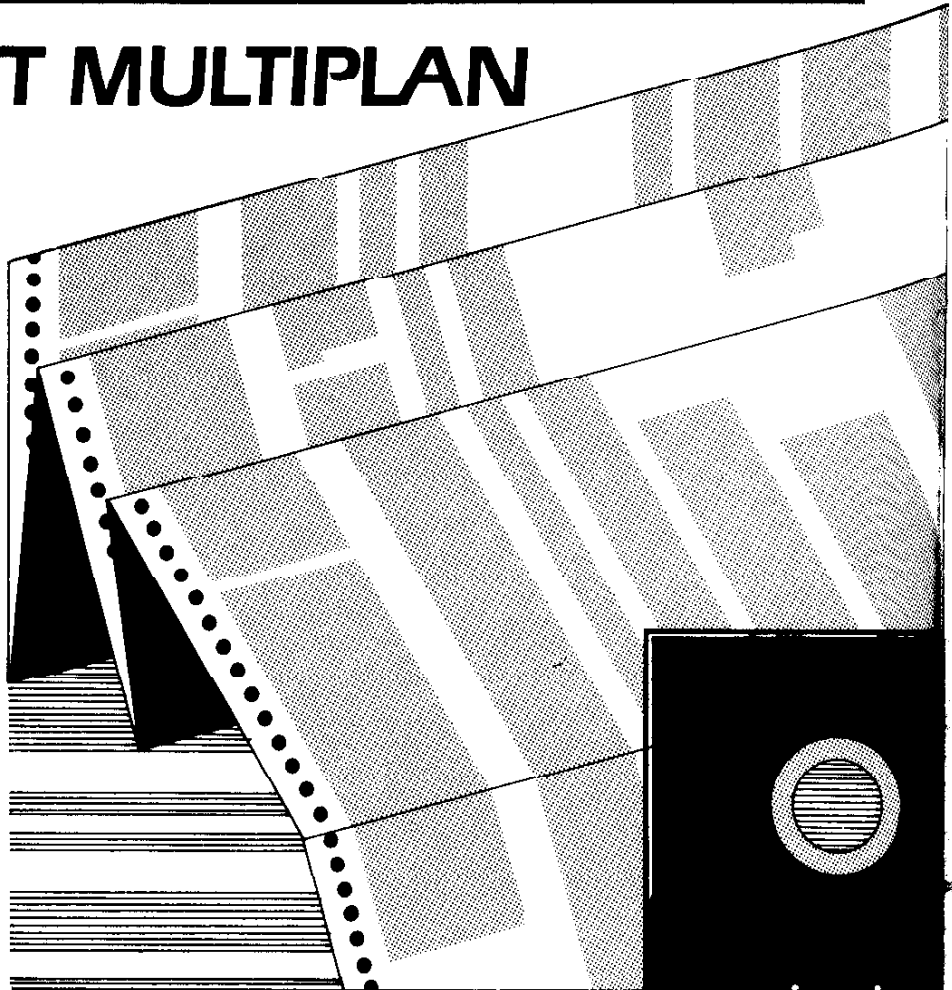
Microsoft Multiplan is a "second generation" electronic worksheet that is intended to be a tool in designing and working with practically any row-column type spreadsheet. It may be useful and timesaving in working with everything from budgets, financial reports and data analysis to expense statements and planning forms. This TI version is designed to be used with the 99/4A only and requires a memory expansion unit, a disk controller and at least one disk drive. I strongly urge the use of an RS232 interface and a printer, also, because you will normally need a hard copy to see a full report all at once.

### DOCUMENTATION

The Multiplan package includes a 140 page manual in a sturdy loose-leaf binder, a solid-state cartridge, a program diskette, a keyboard insertion strip and a quick reference card.

**I probably spent a total of about 8 hours reading and looking up reference material during my preparation for and actual construction of the tutorial spreadsheet.**

The manual is divided into 2 main sections. Part 1 has 7 chapters concerning the actual use of the program and consists of a tutorial that takes you from the planning stage through the construction of a spreadsheet, the printing of it and the use of related spreadsheets that can update each other. Part 2 is a reference that covers all of the elements of this system in detail. It contains 4 chapters that explain the commands and functions that are used. A comprehensive table of contents, index and series of appendices are also included to make it as easy as possible for the user. I probably spent a total of about 8 hours reading and looking up reference material during my preparation for and actual construction of the tutorial spreadsheet. There is a lot of information in the



manual and you will probably not learn all of it immediately but you can learn enough of the basics to become comfortable working with the system.

### PROGRAM FUNCTION

After you have inserted the solid state cartridge, powered-up, and selected number 2 from the initial TI menu, the Multi-plan title screen appears. It does not tell you on the screen, but the manual explains that you have a choice of screen and character colors from which you may select before you press the ENTER key to start the program. Whatever color combination you choose will be the one that must be used during that particular session. You cannot change screen colors during a session. I found that a medium blue background with white characters worked best for me. Some of the color combinations were hard to read,

especially when a word or number was covered by the reverse-video cursor. By the way, you select the screen colors by pressing the space bar, then insert the program diskette and press ENTER to start the program.

It takes about 15 seconds for the program to load, and when it is ready, column numbers 1 through 5 and row numbers 1 through 18 appear on the screen. A Command Line, Message Line and Status Line also appear at the bottom of the screen. These lines will guide you throughout your use of the Multiplan program. A reverse-video cursor will also show the "active" cell. Each column and the cursor are eight characters wide when the program is first used. You can reduce or expand the column size according to your needs but, of course, the wider the columns, the fewer you can see on the screen at one time. The total capacity of the electronic worksheet is 63 columns wide (eight character columns) by 255 rows deep.

I don't have time or the space to go into detail about every element of Multiplan but let me say that if you follow each step of the tutorial part of the program, you should have a pretty good understanding of how to begin setting up practically any spreadsheet for which you have a need. It did take me a little time to get used to the specific command and editing keys, however, because some are different from what we are normally used to on the 99/4A. For example, to backspace a character, you use FCTN-4; to backspace a word, FCTN-5 is used; FCTN-9 is also used as a backspace, but it erases each character as it passes. Other than this sort of thing,

**It did take me a little time to get used to the specific command and editing keys, however, because some are different from what we are used to on the 99/4A.**

the use of this program is pretty straightforward. There is a lot to learn but between the manual, the quick reference card, the keyboard insertion strip and a comprehensive HELP assistance in the program which is keyed in from the console, you should have little trouble developing a simple spreadsheet over a period of a few hours. It will take practice and considerably more time before you can expect to create more sophisticated spread-sheets.

## ERROR HANDLING

There seems to be no problem with program crashes. I have made many mistakes during my first try at working with this program and it has forgiven every one of them. If you happen to do something wrong, there are error messages that let you know the type error and then you must backtrack and correct the problem.

## CONCLUSIONS

Microsoft Multiplan is an extremely flexible tool for those who work with layouts of rows and columns in practically any type of application. It seems to me to be limited primarily by the user's ability to think up uses for it. I still have much to learn about it but I am very enthusiastic concerning its capabilities and relative ease of use. I recommend it highly.

## Library Corner

# HELP! MY "CALL SAY" DOESN'T

by **Guy S. Romano**  
IUG Library Services  
116 Carl St.  
San Francisco, CA 94117  
(415) 753-1149

One of the most common calls we receive at Library Services has to deal with apparent problems with the Speech Synthesizer which in reality are not "problems" but rather a lack of understanding of just how the fantastic speech capabilities of the TI Computer work. To clarify the point let us draw some very broad and imprecise analogies. Let us call the console the "brain" of the whole system. Then by extension the Speech Synthesizer can be called the larynx or "voice-box" of our computer. Our own voice-boxes will not work alone; they need something to drive them to vibrate and create sound. So too with the Speech Synthesizer unit. It also requires something to cause it to create sound. So too with the Speech Synthesizer unit. It also requires something to cause it to create sound. Back then when the 99/4A was the 99/4 and little existed for the computer, this "driver" was simple since no choice was possible. The force that made speech possible was a Command Module called the Speech Editor. With it one could use the Speech Synthesizer to create a very realistic sounding voice in programs and use speech in conjunction with ALL the other capabilities of the TI Computer. (To the best of our knowledge, the 99/4A is still the only small computer that allows the combination of speech, graphics, and music all in the same program.)

With the advent of the 99/4A other wonderful Command Modules came on the scene; Extended Basic and Terminal Emulator II among others. Texas Instruments gave us a great bargain in Extended Basic; they took all the speech capabilities of the old Speech Editor and incorporated them into the Extended Basic module. Now we had two "drivers" for the Speech Synthesizer and they both worked the same way, but they still were limited to a rather small vocabulary. When TI came out with the Terminal Emulator II which was primarily designed for use with a modem for computer hookups by phone, they threw in another present, a different and

marvelous speech capability totally unlike what came before. The TE II now allowed for UNLIMITED speech capability with none of the limitations or restrictions of Speech Editor or Extended Basic. Now "we" could say anything and even change intonation patterns and voice pitch. TI, the forerunner of computer speech, gave us a really powerful and versatile unit neatly contained in one little module for an almost ridiculously low price. As is true, however, as in all other facets of life, with choices comes some inequity. The speech functions of Speech Editor/Extended Basic and Terminal Emulator II are not compatible with one another and their functions cannot be used interchangeably from program to program. But this seeming inequity or incompatibility is only superficial since with a little work on our part, we can change a program written for Speech Editor to one for TE II quite easily.

**TI, the forerunner of computer speech, gave us a really powerful and versatile unit nearly contained in one little module for an almost ridiculously low price.**

The Speech Editor/Extended Basic type of speech "driver" uses statements like CALL SPGET(,,) (not often used) and CALL SAY(XXX). Nothing else is required except that you MUST use only the resident vocabulary. Words may be made to seem more natural sounding by hooking words together with plus signs; i.e. "HOW+ARE+YOU" and then certain phrases were created that are in common usage and these were indicated by the use of the number sign, "#" as in "#TRY AGAIN#".

Terminal Emulator II functions as if it were opening a file (the same thing you do when you "SAVE" a program on cassette, etc. As you can begin to see it is quite simple to convert "CALL SAY" to TE II. Where the older format called "CALL SAY(HOW+ARE+YOU)" TE II used the form of "PRINT #1,"HOW ARE YOU"

Let us say that you have bought a program that needs the Speech Synthesizer but when you RUN it you get

a message that says BAD NAME IN XXXX (where XXXX is the line number). If you immediately look at the line XXXX it will probably have a "CALL SAY" in it. So here is what to do:

```

OLD PROGRAM LINE
XXXX CALL SAY ("THAT+IS
VERY+GOOD")
NEW LINE FOR TE II
XXXX PRINT #1:"THAT IS VERY
GOOD"

```

What you are removing is the CALL SAY and the parentheses plus any of the linkers (plus signs of "+"s) and replacing them with TE II you are using a file structure you have to "open" that file before your computer will recognize it. Therefore, somewhere at the beginning of the program you must insert a line that reads:

```
XXXX OPEN #1:"SPEECH", OUTPUT
```

If you want to be thorough you can then add a line at the end of the program which reads:

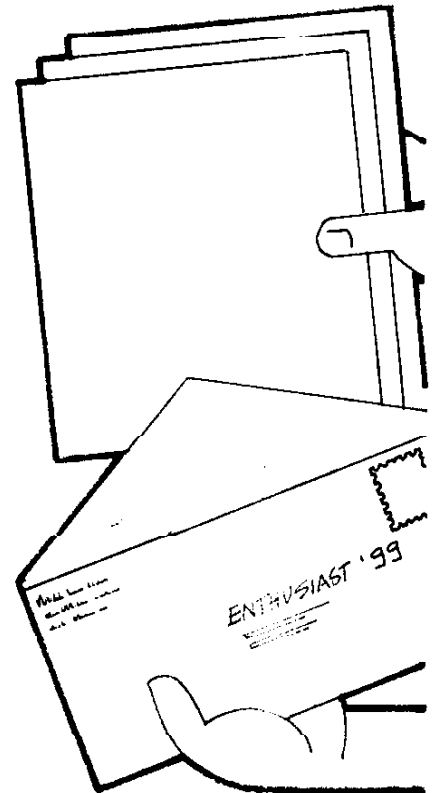
```
XXXX CLOSE #1
```

although this is not necessary. When you make these conversions keep in mind that you can now change the message in quotes to ANYTHING you want since there is no limit on the vocabulary with TE II. "SAVE" this converted program on a new tape for use later.

"OK", you may say, "but even though I have a Speech Synthesizer, I do not have a TE II and am not planning to use the program NOW!!!" Your wish is granted quite simply. Go through the program and look for lines with the "CALL SAY" or even the "PRINT #1:" if the program is written for TE II. Get into EDIT mode — type the line number, then press "FCTN" and "X" simultaneously. The cursor will be flashing over the first letter in the line (anything after the line number). Then type "REM" and press enter. Now when the computer looks at that line and it sees that "REM" it will ignore it and go on to the next line. Later when you get a TE II, etc. You can remove the REM's and make the necessary conversions and then take full advantage of the wonderful world of SPEECH that Texas Instruments has given us. If you have further problems with these types of program, remember to call us at 405-753-1194 (8 AM to 4 PM Mon. thru Sat., Pacific time) or leave a message any other time. That is why we are here — to give you any service you need, to answer questions or find answers for you.

HAVE A NICE CHAT WITH YOUR COMPUTER!

## Enthusiast '99 is published for you!



To make this magazine the most helpful to our members your articles and suggestions are invaluable. If you wish to submit an article or program we would be more than happy to review them for possible use.

Articles dealing with specific personal or business use of any computer in the TI family of personal computers, or innovative ideas dealing with programming or hardware interfacing are most informative. Articles should appeal to a wide interest group on specific subjects.

All manuscripts should be copy edited, error free and ready for typesetting. They should be typed, double spaced with wide margins.

Published manuscripts become the property of the International 99/4 Users Group and our regular rates will be paid upon publication. Unpublished manuscripts will be returned only if a self-addressed envelope with sufficient first class postage attached is enclosed. Why not send your manuscript today!

## WIZARD'S DOMINION

99/4

A Fantasy Adventure

99/4A



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**AMERICAN SOFTWARE  
DESIGN & DISTRIBUTION CO.**  
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```

100 !*****
110 !* "HELICOPTER ATTACK" *
120 !* DESIGNED AND WRITTEN *
130 !* BY JOHN M. PHILLIPS *
140 !* 5502 56TH #504 *
150 !* LUBBOCK TX 79414 *
160 !* ENTHUIAST '99 *
170 !* VERSION 1.1 *
180 !*****
190 !ON BREAK NEXT
200 ON WARNING NEXT
210 ON ERROR 2360
220 CALL CLEAR :: GOTO 2410
230 !*****
240 !* DEFINE CHARACTERS *
250 !*****
260 DISPLAY AT(12,9):"ONE MOMENT"
270 CALL CHAR(88,"187EFF7E3F7E3800")
280 CALL CHAR(96,"F0103879F97F107E")
290 CALL CHAR(97,"0F103879F97F107E")
300 CALL CHAR(98,"387CFE44107C1028")
310 CALL CHAR(99,"00000018183CFFF")
320 CALL CHAR(100,"0000001818")
330 CALL CHAR(101,"0000493E08081422")
340 CALL CHAR(102,"00222A3E08081412")
350 CALL CHAR(103,"000080BCFAFF3040")
360 CALL CHAR(104,"5500A408A401802A")
370 CALL CHAR(105,"66814A804110C8A2")
380 CALL CHAR(106,"01387CD306A491F1")
390 CALL CHAR(112,"3C7EFEF7C101038")
400 CALL CHAR(120,"0000000010387CFF")
410 CALL CHAR(128,"0103070F1F3F7FFF"):: CALL CHAR(129,"FFFFFFFFFFFFFF"):: CALL
CHAR(130,"80C0E0F0F8FCFEFF")
420 CALL CHAR(136,"30303FFFFF7E0C04")
430 CALL COLOR(12,16,6):: CALL COLOR(2,6,6):: CALL COLOR(13,14,6):: CALL COLOR(1
4,7,1):: CALL COLOR(11,13,1)
440 RETURN
450 !*****
460 !* SET UP THE SCREEN
470 !*****
480 CALL CLEAR
490 CALL SCREEN(12)
500 FOR I=1 TO 8 :: CALL HCHAR(I,1,42,32):: NEXT I
510 FOR I=2 TO 32 STEP 3 :: CALL HCHAR(8,I,120):: CALL HCHAR(9,I,129):: NEXT I
520 FOR I=1 TO 31 STEP 3 :: CALL HCHAR(9,I,128):: NEXT I
530 FOR I=3 TO 30 STEP 3 :: CALL HCHAR(9,I,130):: NEXT I
540 DEF TREE ROW=INT(RND*(14-10+1))+10 :: DEF TREE COL=INT(RND*(30-1+1))+1
550 FOR I=1 TO 60 :: CALL VCHAR(TREE ROW,TREE COL,112):: NEXT I
560 DISPLAY AT(24,6):"HELICOPTER ATTACK"

```

## HELICOPTER ATTACK

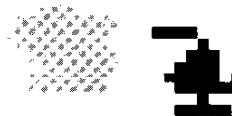
Helicopter Attack is one of several programs that John Phillips has placed in the International 99/4 Users-Group Software Exchange Library. A 22 year old programmer employed by Texas Instruments in Lubbock, Texas, John demonstrates with his program the speed and versatility of using Sprites with Extended BASIC.

John studied programming at Illinois State University prior to landing a position with Texas Instruments. His first job assignment as a cobol programmer for TI in Dallas gave him experience with several pieces of computer hardware. It was during his stay in Dallas that he was first introduced to the TI 99/4A during an employee demonstration. He knew from that moment that he must have one of these wonderful machines!

For the next three months John spent as much time as he possibly could with his TI 99/4A. "There were evenings when John wouldn't even speak to me" said his lovely wife Martee. "He became all consumed with programming his new computer."

John's mastery of the TI 99/4A was quickly rewarded by Texas Instruments as he was transferred to Lubbock, Texas to become part of the software development team. In this new position John and his co-workers are currently developing several new game programs that will be released by TI later this year in Solid State Command Modules.

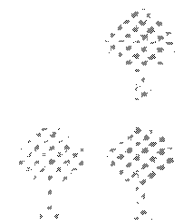
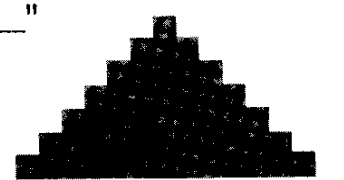
We certainly hope that you enjoy Helicopter Attack and look forward to presenting more of John's programming efforts in future editions of Enthusiast '99.



```

570 CALL VCHAR(24,6,136):: CALL VCHAR(24,26,136)
580 CALL SPRITE(#4,88,16,12,50,0,11)
590 CALL SPRITE(#5,88,16,20,150,0,10)
600 CALL SPRITE(#6,88,16,28,200,0,-11)
610 CALL SPRITE(#7,88,16,36,100,0,10)
620 CALL SPRITE(#8,88,16,44,75,0,-15)
630 CALL SPRITE(#9,88,16,28,75,0,12)
640 CALL SPRITE(#10,88,16,16,95,0,-5)
650 CALL SPRITE(#11,88,16,30,10,0,7)
660 CALL SPRITE(#2,99,2,170,100)
670 RETURN
680 !*****
690 !* RAND HELI ROW *
700 !*****
710 RANDOMIZE
720 TIME=INT(RND*13)+1 :: CALL BASE_MOVE(TARGET$):: IF TIME<>4 AND TIME<>13 AND
TIME<>1 THEN 720
730 IF TIME=1 THEN RETURN ELSE SPEED=INT(RND*(9))+1
740 HELI COUNT=HELI COUNT+1 :: TARGET$="HELI" :: NW HELI$="NO"
750 IF HELI COUNT=HOW MANY+1 THEN CALL MOTION(#2,0,0):: DISPLAY AT(12,9)SIZE(10)
:"WELL DONE!" ELSE 770
760 FOR C=1 TO 800 :: NEXT C :: GOSUB 2270
770 DISPLAY AT(1,1):" HELICOPTER APPROACHING ! !" :: CALL MOTION(#2,0,0)
780 FOR I=1 TO 12 :: CALL SOUND(50,700,0):: CALL SOUND(25,3000,30):: NEXT I
790 CALL HCHAR(1,1,42,31)
800 HR=INT(RND*(57-7+1))+7
810 CALL BASE_MOVE(TARGET$)
820 IF (HR>33 AND HR<44)OR(HR>55 AND HR<58)THEN 800
830 CALL SPRITE(#1,96,2,HR,250,0,-(10+SPEED))
840 RETURN
850 !*****
860 !* EASY OR HARD *
870 !*****
880 CALL CLEAR
890 DISPLAY AT(12,1):"TYPE 'E' FOR EASY::'H' FOR HARD:"
900 DISPLAY AT(20,9):"PRESS ENTER!"
910 ACCEPT AT(13,7)BEEP VALIDATE("EH")SIZE(1):CHOICES$
920 IF CHOICES$="E" THEN CALL MAGNIFY(2)ELSE CALL MAGNIFY(1)
930 FOR G=1700 TO 160 STEP -100 :: CALL SOUND(-100,G,0):: NEXT G
940 FOR G=170 TO 1700 STEP 100 :: CALL SOUND(-100,G,0):: NEXT G
950 RETURN
960 !*****
970 !* GET SKILL LEVEL *
980 !*****
990 CALL CLEAR
1000 DISPLAY AT(6,9):"SKILL LEVEL" :: DISPLAY AT(7,9):"_____ "
1010 DISPLAY AT(10,4):"1= ACE"
1020 DISPLAY AT(12,4):"2= AVERAGE"
1030 DISPLAY AT(14,4):"3= BEGINNER"
1040 DISPLAY AT(20,1):"SKILL LEVEL? "
1050 DISPLAY AT(24,7):"=PRESS ENTER="
1060 ACCEPT AT(20,14)BEEP VALIDATE(DIGIT)SIZE(1):SKLVL
1070 IF SKLVL>3 OR SKLVL<1 THEN 1060
1080 RETURN
1090 !*****
1100 !* TIMING TEST *
1110 !*****
1120 CALL VERSION(EB)

```

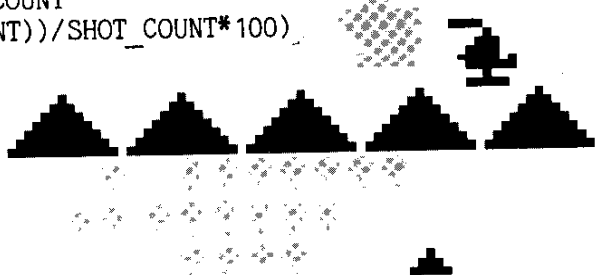




```

1130 IF EB=110 THEN KLOOP=22 :: JLOOP=20 :: ILOOP=17 ELSE KLOOP=16 :: JLOOP=13 :
: ILOOP=10
1140 RETURN
1150 !*****
1160 !* HOW MANY CHOPPERS? *
1170 !*****
1180 CALL CLEAR
1190 DISPLAY AT(12,1):" HOW MANY CHOPPERS CAN YOU      DESTROY SUCCESSFULLY?"
1200 DISPLAY AT(15,1):" MINIMUM=10  GREATEST=25  "
1210 DISPLAY AT(24,9):"PRESS ENTER!"
1220 ACCEPT AT(18,13)BEEP SIZE(2)VALIDATE(DIGIT):HOW_MANY
1230 IF HOW_MANY<10 OR HOW_MANY>25 THEN 1220
1240 IF SKLVL=1 THEN SHOT_LIMIT=INT(HOW_MANY*3.3)
1250 IF SKLVL=2 THEN SHOT_LIMIT=INT(HOW_MANY*5.2)
1260 IF SKLVL=3 THEN SHOT_LIMIT=INT(HOW_MANY*7.1)
1270 DISPLAY AT(20,2):"*YOU ARE ALLOWED";SHOT_LIMIT;"SHOTS!"
1280 FOR C=1 TO 500 :: NEXT C
1290 RETURN
1300 !*****
1310 !* STATISTICS *
1320 !*****
1330 CALL MOTION(#2,0,0)
1340 DISPLAY AT(16,3):"CHOPPERS BOMBED=>";HELI_COUNT
1350 DISPLAY AT(17,3):"TROOPERS KILLED=>";HELI_COUNT-MISS_COUNT
1360 DISPLAY AT(18,3):"SHOTS FIRED   =>";SHOT_COUNT
1370 PCT=INT(((HELI_COUNT)+(HELI_COUNT-MISS_COUNT))/SHOT_COUNT*100)
1380 IF SHOT_COUNT=0 THEN PCT=0
1390 DISPLAY AT(19,3):"KILL PERCENTAGE=>";PCT
1400 FOR I=1 TO 350 :: NEXT I
1410 CALL HCHAR(16,1,32,128)
1420 RETURN
1430 !*****
1440 !* PLANE TIME      *
1450 !*****
1460 RANDOMIZE
1470 TARGET$="PLANE" :: PR=INT(RND*(57-7)+1)+7 :: CALL SPRITE(#1,103,15,PR,1,0,3
0)
1480 CALL BASE MOVE(TARGET$)
1490 FOR K=1 TO KLOOP :: CALL POSITION(#1,SPR,SPC,#2,SBR,SBC):: IF SPC>SBC-10 AN
D SPC<SBC+10 THEN 1520
1500 IF SPC>235 THEN CALL DELSPRITE(#1):: RETURN
1510 NEXT K :: GOTO 1580
1520 CALL SPRITE(#3,100,2,SPR+1,SPC+4,40,0):: CALL SOUND(-4000,-3,0)
1530 FOR J=1 TO JLOOP :: CALL COINC(#2,#3,6,HIT):: IF HIT<>-1 THEN 1570 ELSE CAL
L DELSPRITE(#1,#3)
1540 CALL SOUND(-1,2000,30):: FOR C=1 TO 25 :: CALL PATTERN(#2,104,#2,105,#2,106
):: NEXT C :: CALL DELSPRITE(#2)
1550 DISPLAY AT(12,9)SIZE(10):"YOU LOSE!!" :: FOR C=1 TO 500 :: NEXT C
1560 GOSUB 2280 !PLAY AGAIN
1570 NEXT J
1580 CALL DELSPRITE(#3,#1):: CALL SOUND(-1,2000,30)
1590 RETURN
1600 !*****
1610 !* INSTRUCTIONS  *
1620 !*****
1630 CALL CLEAR
1640 CALL SCREEN(2):: FOR I=1 TO 9 :: CALL COLOR(I,16,2):: NEXT I
1650 DISPLAY AT(12,1):"DO YOU WANT INSTRUCTIONS?"
1660 DISPLAY AT(13,10):"Y OR N"

```



```

1670 DISPLAY AT(24,8):"PRESS ENTER!"
1680 ACCEPT AT(18,12)BEEP VALIDATE("YN")SIZE(1):INSTR$
1690 IF INSTR$="N" THEN RETURN
1700 CALL CLEAR
1710 MSG$="AS COMMANDER OF THE GROUND- TO-AIR DEFENSE OF TEXAS, IT IS UP TO YOU
TO DESTROY ALL ENEMY HELICOPTERS AND PARA- TROOPERS."
1720 GOSUB 1960
1730 MSG$="YOU MAY CHOOSE AN EASY OR HARD VERSION OF THE GAME AND A SKILL LEVE
L: 'ACE', 'AVERAGE', OR 'BEGINNER'." :: GOSUB 1960
1740 MSG$="AN 'ACE' MAY MISS ONE SHOT PER PARATROOPER AND MAY MISS ONLY ONE TROO
PER PER GAME." :: GOSUB 1960
1750 MSG$="AN 'AVERAGE' MAY MISS TWO SHOTS PER TROOPER AND MAY MISS ONLY
TWO TROOPERS DURINGTHE GAME." :: GOSUB 1960
1760 MSG$="A 'BEGINNER' MAY MISS THREE SHOTS PER TROOPER AND MAY MISS ONLY THR
EE TROOPERS THE ENTIRE GAME." :: GOSUB 1960
1770 MSG$="IF YOU FAIL TO MEET THESE CONDITIONS, YOU ARE INSTANTLY DESTR
OYED BY THE ENEMY." :: GOSUB 1960
1780 MSG$="IT IS IMPERATIVE THAT YOU ARE IN CONSTANT MOTION BECAUSE IF THE
ENEMY PLANE CATCHES YOU STANDING STILL," :: GOSUB 1960
1790 MSG$="YOUR RADAR IS LOCKED UP AND YOU CANNOT MOVE NOR DEFEND YOURSELF FROM
THE ENEMY PLANE. YOU WILL BE DESTROYED" :: GOSUB 1960
1800 MSG$="YOU HAVE THE OPTION TO STATHE NUMBER OF ENEMY HELI- COPTERS YOU T
HINK YOU CAN DESTROY, ALSO." :: GOSUB 1960
1810 MSG$="DEPENDING ON THE NUMBER OF HELICOPTERS CHOSEN, YOU WILLBE GIVEN A PR
OPORTIONATE SUPPLY OF AMMUNITION TO COMPLETE YOUR MISSION." :: GOSUB 1960
1820 MSG$="IF THE ENEMY DETECTS THAT YOU HAVE RUN OUT OF AMMO, THEY WILL DES
TROY YOU INSTANTLY." :: GOSUB 1960
1830 MSG$="YOU HAVE THE OPTION OF USINGEITHER THE KEYBOARD OR A JOYSTICK..."
:: GOSUB 1960
1840 MSG$="USING THE KEYBOARD, 'S'&'D' MOVES QUICKLY RIGHT AND LEFT'E'&'X' MOVES
SLOWLY RIGHT AND LEFT AND 'Y' FIRES A BULLET"
1850 GOSUB 1960
1860 ZMSG$="USING JOYSTICK #2, RIGHT ANDLEFT MOVES QUICKLY, UP MOVESLOWLY "
1870 MSG$=ZMSG$&"RIGHT AND DOWN MOVES SLOWLY LEFT. THE BUTTON FIRES A BULLET
." :: GOSUB 1960
1880 MSG$="THERE IS A SLIGHT DELAY WHENFIRING, SO SHOOT AHEAD OF YOUR TARGET!"
:: GOSUB 1960
1890 MSG$="STATISTICS ARE DISPLAYED AFTER EVERY KILL. BE SURE AND LOOK AT T
HE LOWER RIGHT CORNER TO SEE HOW MANY TROOPERS HAVE ESCAPED"
1900 GOSUB 1960
1910 MSG$="WHEN THE RADAR SIGNALS AN APPROACHING CHOPPER OR WHEN THE STATISTIC
S ARE SHOWN, YOU CANNOT MOVE." :: GOSUB 1960
1920 MSG$="YOU MAY ONLY FIRE AFTER THE RADAR HAS 'BEEPED'... TO CONSERVE AMMO
." :: GOSUB 1960
1930 MSG$="SUCCESSFULLY KILLING YOUR ESTIMATED NUMBER OF CHOPPERSIS THE REQUIR
EMENT FOR WINNING THE GAME." :: GOSUB 1960
1940 MSG$="GOOD LUCK. PRESS ANY KEY TO START THE GAME...
JOHN PHILLIPS" :: GOSUB 1960

1950 RETURN
1960 !*****
1970 !* DISPLAY THE GAME *
1980 !* INSTRUCTIONS *
1990 !*****
2000 CALL CLEAR
2010 PRINT MSG$
2020 FOR I=1 TO 9 :: PRINT :: NEXT I
2030 DISPLAY AT(24,1):"PRESS ANY KEY TO GO ON..."
2040 CALL KEY(O,K,S):: IF S=0 THEN 2040 ELSE RETURN

```



```

2050 RETURN
2060 !*****
2070 !* ONE GOT AWAY *
2080 !*****
2090 MISS COUNT=MISS COUNT+1
2100 CALL VCHAR(24,27+MISS COUNT,98)
2110 IF MISS COUNT=SKLVL+1 THEN GOSUB 2140 :: DISPLAY AT(12,9)SIZE(10):"YOU LOSE
!!" ELSE GOTO 2130
2120 FOR I=1 TO 500 :: NEXT I :: GOSUB 2280
2130 RETURN
2140 !*****
2150 !* YOU'VE LOST GR RTN*
2160 !*****
2170 CALL MOTION(#2,0,0):: CALL SPRITE(#1,103,15,50,1,0,20)
2180 CALL POSITION(#2,BR,BC)
2190 FOR K=1 TO 500 :: CALL POSITION(#1,PR,PC):: IF PC>BC-5 AND PC<BC+5 THEN 221
0
2200 NEXT K
2210 CALL MOTION(#1,0,0):: CALL SPRITE(#3,100,2,PR+4,PC,35,0):: CALL SOUND(4000,
-3,0)
2220 FOR J=1 TO 18 :: CALL COINC(#2,#3,6,HIT):: IF HIT<>-1 THEN 2260 ELSE CALL D
ELSPRITE(#2,#3)
2230 CALL SOUND(-1,40000,30):: CALL MOTION(#1,0,20):: FOR C=1 TO 290 :: CALL POS
ITION(#1,PR,PC):: IF PC>250 THEN 2250
2240 NEXT C
2250 CALL DELSPRITE(#1):: RETURN
2260 NEXT J
2270 RETURN
2280 !*****
2290 !* PLAY AGAIN?!?!? *
2300 !*****
2310 CALL CLEAR :: CALL CHARSET :: CALL DELSPRITE(ALL)
2320 DISPLAY AT(24,9):"PRESS ENTER!"
2330 DISPLAY AT(12,1):"PLAY AGAIN(Y/N)?" :: ACCEPT AT(12,17)VALIDATE("YN")BEEP S
IZE(1):A$
2340 IF A$="N" THEN CALL CLEAR :: STOP
2350 CALL CLEAR :: DISPLAY AT(12,2):"RE-INITIALIZING THE SYSTEM" :: RUN 100
2360 RETURN
2370 !*****
2380 !* ERROR ROUTINE! *
2390 !*****
2400 ON ERROR 2370
2410 RETURN NEXT
2420 !*****
2430 !* DRIVER *
2440 !*****
2450 HELI COUNT,SHOT COUNT,MISS COUNT=0
2460 GOSUB 1600 :: CALL CLEAR :: CALL CHARSET :: CALL SCREEN(8)
2470 GOSUB 230 !DEFINE CHARACTERS AND COLORS
2480 GOSUB 1090 !TIMING TEST FOR V100 OR V110
2490 GOSUB 850 !EASY OR HARD CHOICE
2500 GOSUB 960 !SKILL LEVEL
2510 GOSUB 1150 !HOW MANY?
2520 GOSUB 450 !SET SCREEN
2530 GOSUB 1300 :: PSHOTS=0 !STATS SUBRTN
2540 GOSUB 680 !RAND HELI
2550 IF TIME=1 THEN GOSUB 1430 :: GOTO 2540 !SEND PLANE OR SEND HELI
2560 CALL BASE MOVE(TARGET$)
2570 CALL SHOT CHECK(SHOT FLAG$,TARGET$)
2580 IF SHOT COUNT<SHOT LIMIT THEN 2600

```



```

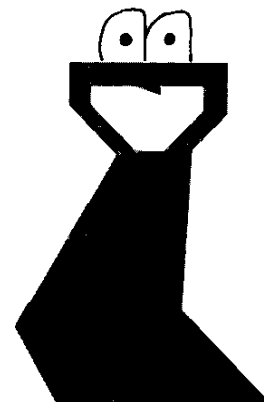
2590 GOSUB 2140 :: DISPLAY AT(12,9)SIZE(10):"YOU LOSE!!" :: FOR I=1 TO 500 :: NE
XT I :: GOSUB 2280
2600 IF SHOT_FLAG$="ON" THEN CALL SHOT(SHOT_FLAG$,TARGET$,NW_HELI$,SHOT_COUNT,IL
OOP):: IF TARGET$="PARA" THEN PSHOTS=PSHOTS+1
2610 IF PSHOTS=SKLVL+2 THEN CALL DELSPRITE(#1):: TARGET$="HELI" :: NW_HELI$="YES
" :: GOSUB 2060 !A TROOPER GOT AWAY!
2620 IF NW_HELI$="YES" THEN 2530 ELSE 2560
2630 STOP
2640 SUB BASE_MOVE(TARGET$)
2650 !*****
2660 !* SUB BASE MOVE
2670 !*****
2680 IF TARGET$="HELI" THEN CALL PATTERN(#1,97)
2690 CALL KEY(0,K,S):: IF S=0 THEN 2760
2700 IF K=89 THEN SUBEXIT
2710 IF K=83 THEN X=-4 :: GOTO 2780
2720 IF K=68 THEN X=4 :: GOTO 2780
2730 IF K=69 THEN X=.66 :: GOTO 2780
2740 IF K=88 THEN X=-.66 :: GOTO 2780
2750 SUBEXIT
2760 CALL JOYST(2,X,Y):: IF X=0 AND Y=0 THEN CALL MOTION(#2,0,0):: SUBEXIT
2770 IF Y<>0 THEN CALL MOTION(#2,0,Y):: GOTO 2790
2780 CALL MOTION(#2,0,X*6)
2790 SUBEND
2800 SUB SHOT_CHECK(SF$,TARGET$)
2810 !*****
2820 !* CHECK FOR BUTTON *
2830 !*****
2840 IF TARGET$="HELI" THEN CALL PATTERN(#1,96)
2850 CALL KEY(2,B,S)
2860 IF S=0 OR (B<>18 AND B<>89) THEN SF$="OFF" :: SUBEXIT
2870 SF$="ON"
2880 SUBEND
2890 SUB SHOT(SF$,TARGET$,NW_HELI$,SHOT_COUNT,ILOOP)
2900 !*****
2910 !* SHOOT ROUTINE *
2920 !*****
2930 IF TARGET$="HELI" THEN CALL PATTERN(#1,97)
2940 CALL POSITION(#2,SBR,SBC)
2950 CALL SOUND(50,-5,0)
2960 CALL SPRITE(#3,100,2,SBR-4,SBC,-70,0)
2970 FOR I=1 TO ILOOP :: CALL COINC(#3,#1,8,HIT):: IF HIT=-1 THEN 2990
2980 NEXT I :: GOTO 3080
2990 CALL DELSPRITE(#3)
3000 IF TARGET$="PARA" THEN 3040
3010 CALL SOUND(100,-7,0):: CALL PATTERN(#1,104):: FOR J=1 TO 30 :: NEXT J
3020 CALL PATTERN(#1,98):: TARGET$="PARA" :: CALL MOTION(#1,5,INT(RND*20)+1-10):
: NW_HELI$="NO"
3030 GOTO 3080
3040 CALL SOUND(100,-7,0):: CALL PATTERN(#1,101):: CALL MOTION(#1,28,0):: CALL S
OUND(-3000,-1,0)
3050 FOR K=1 TO 50 :: CALL PATTERN(#1,102):: CALL POSITION(#1,Y1,X1):: IF Y1>180
THEN 3070
3060 CALL PATTERN(#1,101):: NEXT K
3070 CALL SOUND(-1,5000,30):: CALL DELSPRITE(#1):: TARGET$="HELI" :: NW_HELI$="Y
ES" :: GOTO 3080
3080 CALL DELSPRITE(#3):: SF$="OFF" :: SHOT_COUNT=SHOT_COUNT+1
3090 SUBEND
3100 END

```

```
100 REM COOKIE FILE
110 REM BY REGENA
120 GOSUB 1760
130 GOTO 380
140 CALL HCHAR(22,27,137)
150 CALL HCHAR(22,28,136,2)
160 CALL HCHAR(22,30,138)
170 CALL HCHAR(21,28,128,2)
180 RETURN
190 CALL HCHAR(21,27,124)
200 CALL HCHAR(21,28,126)
210 CALL HCHAR(22,27,125)
220 CALL HCHAR(22,28,127)
230 RETURN
240 CALL HCHAR(22,26,137)
250 CALL HCHAR(22,27,136,2)
260 CALL HCHAR(22,29,138)
270 CALL HCHAR(21,27,139)
280 CALL HCHAR(21,28,140)
290 RETURN
300 CALL HCHAR(22,26,96,4)
310 CALL HCHAR(21,26,103,4)
320 RETURN
330 CALL HCHAR(22,26,129)
340 CALL HCHAR(22,27,130,2)
350 CALL HCHAR(22,29,131)
360 CALL HCHAR(21,27,103,2)
370 RETURN
380 DIM ING$(19),INV$(19,1)
390 FOR I=0 TO 19
400 READ A$,INV$(I,0)
410 ING$(I)=A$&INV$(I,0)
420 NEXT I
430 CALL CLEAR
440 CALL COLOR(2,2,1)
450 CALL COLOR(9,7,1)
460 PRINT "CHOOSE:" : : "1 NEED TO KNOW WHAT" : " CAN BE MADE"
470 PRINT : : "2 WANT TO SEE A" : " CERTAIN RECIPE" : : :
480 PRINT "3 END PROGRAM" : : :
490 CALL KEY(0,KEY,S)
500 IF KEY=49 THEN 1300
510 IF KEY=51 THEN 2470
520 IF KEY<>50 THEN 490
530 CALL CLEAR
540 PRINT "CHOOSE:" :
550 PRINT "A ALMOND COOKIES" : "B BALL COOKIES" : "C BROWNIES"
560 PRINT "D BUTTERSCOTCH BARS" : "E CHOCOLATE CHIP BARS" : "F CHOCOLATE CHIP COO
KIES"
570 PRINT "G CHOCOLATE DROP COOKIES" : "H HONEY BALLS" : "I HONEY SPICE COOKIES"
580 PRINT "J MEXICAN WEDDING COOKIES" : "K OATMEAL CHOCOLATE CHIPS" : "L OATMEAL
CRISPS"
590 PRINT "M SNICKERDOODLES" : "N SUGAR COOKIES" : "O TOFFEE BARS"
600 CALL KEY(0,KEY,S)
610 IF (KEY<65)+(KEY>79) THEN 600
620 CALL CLEAR
```



## COOKIE FILE



```

630 ON KEY=64 GOTO 640,660,680,700,720,740,760,780,800,820,840,860,880,900,920
640 RESTORE 2310
650 GOTO 930
660 RESTORE 2320
670 GOTO 930
680 RESTORE 2330
690 GOTO 930
700 RESTORE 2340
710 GOTO 930
720 RESTORE 2350
730 GOTO 930
740 RESTORE 2360
750 GOTO 930
760 RESTORE 2370
770 GOTO 930
780 RESTORE 2380
790 GOTO 930
800 RESTORE 2390
810 GOTO 930
820 RESTORE 2400
830 GOTO 930
840 RESTORE 2410
850 GOTO 930
860 RESTORE 2420
870 GOTO 930
880 RESTORE 2430
890 GOTO 930
900 RESTORE 2440
910 GOTO 930
920 RESTORE 2450
930 READ A$,G
940 PRINT A$: :
950 ON G GOSUB 140,190,240,300,330
960 I=0
970 FOR J=0 TO 19
980 READ B$
990 IF B$="" THEN 1050
1000 IF B$="0" THEN 1050
1010 AMT(I)=VAL(B$)
1020 INGR$(I)=ING$(J)
1030 PRINT AMT(I);INGR$(I)
1040 I=I+1
1050 NEXT J
1060 READ T
1070 PRINT "BAKE AT";T;"DEGREES."
1080 IF G<>2 THEN 1100
1090 PRINT "ROLL IN POWDERED SUGAR."
1100 PRINT "WANT TO CONVERT RECIPE?(Y/N)"
1110 CALL KEY(0,KEY,S)
1120 IF KEY=78 THEN 1270
1130 IF KEY<>89 THEN 1110
1140 PRINT "MULTIPLY BY WHAT NUMBER"
1150 INPUT "OR DECIMAL FRACTION? ":F
1160 IF F>0 THEN 1190
1170 PRINT "SORRY, F>0"
1180 GOTO 1140
1190 CALL CLEAR
1200 PRINT F;"TIMES ORIGINAL RECIPE": :

```

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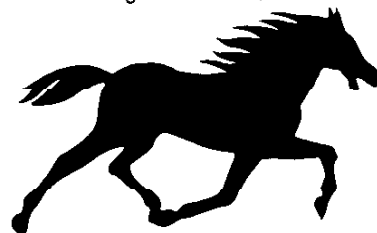
```

1210 PRINT A$: :
1220 FOR K=0 TO I-1
1230 PRINT F*AMT(K);INGR$(K)
1240 NEXT K
1250 PRINT : "CONVERT AGAIN? (Y/N)"
1260 GOTO 1110
1270 PRINT : "PRESS ANY KEY TO CONTINUE."
1280 CALL KEY(0,KEY,S)
1290 IF S=0 THEN 1280 ELSE 430
1300 CALL CLEAR
1310 PRINT "IN THE FOLLOWING LIST,"
1320 PRINT "PRESS ""Y"" IF YOU HAVE"
1330 PRINT "THE INGREDIENT."
1340 PRINT "PRESS ""N"" IF YOU DO NOT."
1350 PRINT : "PRESS ""S"" TO START OVER." : : : : :
1360 CALL SOUND(150,1397,2)
1370 YS=0
1380 FOR K=0 TO 19
1390 PRINT " ";INV$(K,0)
1400 CALL KEY(0,KEY,S)
1410 IF KEY=83 THEN 1300
1420 IF KEY=78 THEN 1450
1430 IF KEY<>89 THEN 1400
1440 YS=YS+1
1450 CALL HCHAR(23,3,KEY)
1460 INV$(K,1)=CHR$(KEY)
1470 NEXT K
1480 C=0
1490 PRINT : : "YOU CAN MAKE:" : :
1500 IF INV$(0,1)="N" THEN 1530
1510 IF INV$(7,1)="N" THEN 1530
1520 IF YS>4 THEN 1550
1530 PRINT "NOTHING TODAY.": "YOU NEED MORE SUPPLIES."
1540 GOTO 1270
1550 RESTORE 2310
1560 READ A$,G
1570 FOR J=0 TO 19
1580 READ B$
1590 IF B$="" THEN 1620
1600 IF B$="0" THEN 1620
1610 IF INV$(J,1)="N" THEN 1660
1620 NEXT J
1630 CALL SOUND(150,1397,2)
1640 PRINT A$
1650 C=C+1
1660 READ D$
1670 IF D$="ZZZ" THEN 1720
1680 IF LEN(D$)<6 THEN 1660
1690 A$=D$
1700 READ G
1710 GOTO 1570
1720 IF C=0 THEN 1530
1730 PRINT : "GO AHEAD AND BAKE!"
1740 GOTO 1270
1750 STOP
1760 CALL CLEAR
1770 CALL CHAR(96,"EFFDB7FEDBFFB7FD")
1780 CALL COLOR(2,13,13)
1790 CALL CHAR(97,"F6BCE8FOAOC08")

```

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2350 DATA CHOCOLATE CHIP BARS,4,.5,,1,,1,1,1.75,,.5,.5,,,,.5,,12,,,,,350  
 2360 DATA CHOCOLATE CHIP COOKIES,3,.5,.25,.5,,1,.5,1,,.5,.5,,,,,6,,,,,375  
 2370 DATA CHOCOLATE DROP COOKIES,3,.5,,1,,1,1,1.67,,.5,.5,,6,,.5,,,,,350  
 2380 DATA HONEY BALLS,2,.5,,,,,2,,1,1,,,,.25,,,,,300  
 2390 DATA HONEY SPICE COOKIES,1,.5,.75,,4,,.5,1,,,,.5,,,,,375  
 2400 DATA MEXICAN WEDDING COOKIES,2,.75,,,,.67,,1,1.5,,,,.25,1,,,,.75,,,,,325  
 2410 DATA OATMEAL CHOCOLATE CHIPS,3,1,1,.5,,2,1,2,,1,1,,,,,2,6,,,,,350  
 2420 DATA OATMEAL CRISPS,1,1,1,1,,2,1,1.5,,1,1,,,,,3,,,,,350  
 2430 DATA SNICKERDOODLES,1,1,1.5,,2,,2.75,3,,.5,,,,,5,400  
 2440 DATA SUGAR COOKIES,5,.67,.75,,,,1,.5,2,1.5,,.25,,,,.25,,,,,375  
 2450 DATA TOFFEE BARS,4,1,,1,,1,2,,,,,6,,,,,350  
 2460 DATA ZZZ  
 2470 CALL CLEAR  
 2480 END

Now that you have typed in Cookie File it is time to use it. First, with one finger on your computer and your eyes on your cupboard, check through the ingredient inventory. Press Y if you have the ingredient and N if you do not. After you go through the list the computer will tell you which cookies you can make with the ingredients you have. Go back to the menu screen and pick a cookie recipe. The recipe will be displayed on the screen. You may convert the recipe if you desire — multiply by 2 or 3 or 5 or whatever.

If you would like to try these, brownies, butterscotch bars, chocolate chip bars, and toffee bars are bar cookies — cook the brownies in an 8-inch or 9-inch square pan and the others in a 9

x 13 pan. Chocolate chip cookies, chocolate drop cookies, honey spice cookies, and oatmeal chocolate chips are drop cookies. Almond cookies you form into balls then flatten, then place an almond on top of each cookie. Honey balls and Mexican wedding cookies are rolled into balls to bake. When they are still warm, roll in powdered sugar; after cool roll in powdered sugar again. Snickerdoodles are rolled into balls then rolled in cinnamon and sugar before baking. Sugar cookies are the kind of cookies you cut out with cookie cutters. Ball cookies are drop cookies, but flatten them before baking and sprinkle "ball" cake decorations on top. Oatmeal crisps are refrigerator cookies.


# Cancer is often curable.

# The fear of cancer is often fatal.

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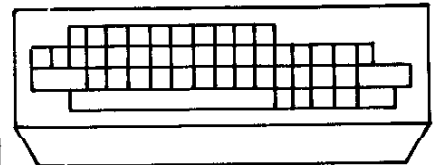
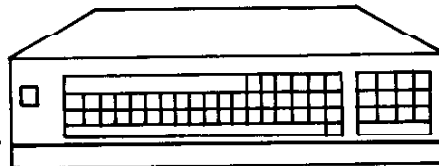
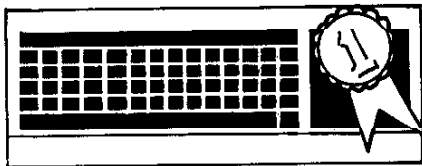
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# THE ASSEMBLY LINE



BY BILL GRONOS

## BENCHMARKS: PROVING YOUR COMPUTER IS THE BEST

I took my revenge on a local computer store this weekend. Unless you live in Four Corners, Idaho, you probably have a similar one in your neighborhood.

Eighteen months ago, I went into this store with an extremely limited knowledge of the various low-priced computers. I had read about the 99/4A and I was impressed that a home computer had a 16 bit microprocessor. At that time, the going price for a 4/A was about \$450—roughly the same as the Atari 400. I had the following conversation with a salesman who came after me like a shark homing in on a swimmer with nosebleed:

"May I help you?"

"Do you have the Texas Instruments 99/4A?"

"No. But you don't want one anyway."

"I don't! Why not?"

"You can't get any software for them." "I'm not very interested in buying software, I intend to write my own."

"Well, their having problems with the keyboard."

"Well, they had problems, but the 4/A has a new typewriter style keyboard."

"But the 99/4A is very slow."

(He caught my attention with that barb, I said incredulously . . .)

"But how can that be! It has a 16 bit microprocessor!?"

"Yah, but they don't use it as one."

(If I had known more at this point, this remark would have made me realize this guy knew as much about computers as a lobotomized tuna fish — the canned variety).

He then sat me down with a "400" and proceeded to plug in a bunch of "Gee whizz!?" demo software. I was beginning to falter. Perhaps I had been

too hasty in deciding to buy a computer without doing more research.

I went to the library to see what I could learn about the myriad of computers available, the 99/4A was being attacked on all fronts. What made matters worse, nobody in town had a 4/A I could sit down and try out. After digesting all this negativism, I made a painful decision — I would buy the 99/4A without a test drive. All my hopes rested in the mysterious microcircuit that could process machine instructions up to 48 bits in length. You and I made the right choice — the TI 99/4A is by furlongs the best computer buy on the market.

## VENGEANCE IS MINE!

I went into the same computer store last week, interested in seeing a printer. All I wanted was a free demo. A friend and I sat down in front of a printer and two commission-hungry sales sharks reenacted the Olympic scenes in "Chariots of Fire" trying to get to us first. As fate would have it, the faster of the two turned out to be the person who had-mouthed the 99/4A a year and a half ago.

"Could we get a demo of this printer?"

"What kind of system do we have?"

"A TI 99/4A."

(I hope this guy has double-stitching in his nose, 'cause when he turned it up it scraped the ceiling)

"I don't think it will work on your 'system.'"

"Oh . . . we think it will!"

"Let me show you another printer", said the spider to what he must of thought to be two flies. "It must be more expensive", said my friend. And of course, it was.

We got the demo we wanted and the salesman was beginning to get tedious. Now was the time to strike a return blow for the 99/4.

Give a man a fish and he'll eat for a day-Teach a man to fish and he'll eat for a lifetime. Tuna for lunch was sounding better and better, so I decided to reel 'em in.

Now even the greenest fisherman knows you got to have bait, so I dumped out the following chum: "How come this Apple doesn't fill up the screen instantly with text . . . my 99/4 does?". All this brought was a suspicious look. The hook was showing, so I added more bait: "The 99/4 sure has a fantastic assembly language." The line grew taut. "They don't even put the registers on the chip, instead they put them in software", said the salesman sarcastically. "got ya", thought I. The gills were showing above his clip-on tie. Leave it to a salesman to try and say an advantage is really a disadvantage. If he was going to be this big a fish, I would give 'em the gaff.

"But that isn't a drawback, it's just one of the many advanced features of the 990 family of minicomputers. It allows you to have a different set of registers for every subroutine. You don't have to waste time 'pushing' and 'popping' the register values."

(At this, the shark became a carp. He tried to twist away, so I gaffed 'em again.)

"Another innovation is its 'Memory to Memory' architecture. Eight bit chips only dream of such things."

(He mumbled something about one of the popular 8 bit processors having

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the same capability, but he must have seen it demonstrated in a dream 'cause it doesn't.)

When he realized it was fruitless to attack the obviously superior hardware system of the 99/4, he dug deep into his gunnysack of misrepresentation and resurrected the no software myth:

"But there's almost no third-party software . . ."

"Au contraire, mon ami. There's a place in town (the U.G.) that has more than 900 programs in their user's library. Third-party programmers abound. Many companies are manufacturing products for the 99/4.

By this time, my friend was becoming very embarrassed, so he pulled me out of the place before I had a chance to yell out. "How about single instruction, 32 bit multiply and divides . . . let's see your Z-80s and 6502As do that." I could go on and on.

## THE BOTTOM LINE: PUTTING YOUR HARDWARE WHERE YOUR MOUTH IS.

In my encounter with the salesman, I defended the 99/4 with words. Could I back up my claims with action? I receive many letters from readers who say that friends who own VICs and Atari's berate them for their lack of judgement in buying a 99/4. I hope this column will give you some ammunition with which to fight back.

Other computer makers talk a good game — but talk is cheap and it takes money to ride the bus. Demos speak louder than words. Benchmarks are the recognized standards for comparing different computer systems.

A benchmark is a point of reference for measuring or judging quality. For computers, the standard benchmark is to have the computer do a task that is common to many programming applications. The usual unit of measurement is the second, or a subdivision thereof.

Typical benchmarks are sorts (which are notoriously slow), prime number generation (which is fairly abstract), or various other mathematical computations. If I had my choice of weapons in a computer duel, I'd pick the latter category because 16 bit processors are prized as number crunchers.

We all want to say we own the best; such is human nature. Believe me, we have the best computer. When comparing our computer to the rest of the pack, we have one nagging point-speed.

Never mind that the VIC 20's BASIC can't do half of what our's does, their owners will tell you, it's faster so it's better. They do have a point, as speed is a recognized standard. Why is our BASIC slower??

Imagine a race between yourself and the world's record holder for the mile. For the majority of us, it wouldn't be much of a contest. Now imagine that Mr. Speedy is forced to carry a sofa during the race and have fifteen feet of the NFL's anchor chain wrapped around his neck. Darn right we'll beat him to the finish line — he'll be lucky to finish at all. Does winning that race mean we are the better runner? It's a similar situation with your computer.

## WHY TI BASIC IS SLOWER

Your BASIC programs must be translated into instructions that your central processing unit can handle. While your CPU is very fast, it is also very dumb. All you assembly language programmers know first hand, probably to your dismay, just how elementary the machine language instruction set is. With BASIC, the instructions must be retranslated over and over as your program runs. That is a considerable amount of processing "overhead". Now add to that the fact that a large part of your BASIC isn't written in machine language! It is written in another high level language called Graphics Programming Language (GPL). Because of this, a double interpretation must be done. Add to these burdens the way the system memory is handled and you'll see that my sofa-carrying sprinter analogy isn't too exaggerated.

There are only 256 bytes of RAM memory in the console that are directly readable by the CPU. Your 16K is owned and operated by your video display processor (VDP). When the CPU needs to access this memory it must ask for it a byte at a time. It is also necessary to slow the CPU down so that it won't ask for memory faster than it can be delivered. Your CPU is placed in a position of a thoroughbred chomping at its bit. It's a testimony to the CPU's ability that it can operate as fast as it does under the circumstances. Bear all this in mind as we discuss the "Idiot" benchmark.

## THE "IDIOT" BENCHMARK: VARIATIONS ON A THEME.

This last weekend I attended a meeting of the Houston User's Group as a guest. Three of TI's top hotdogs were

there to give a dog and pony show of some upcoming products. "Dog" is the operative word here, as TI has a marked ability to make their own products look bad.

TI has coined the word "Idiot" for a simple benchmark where the numbers from one to one thousand are scrolled up the screen. In BASIC the program looks like this:

```
100 FOR X=1 TO 1000
200 PRINT X
300 NEXT X
```

Readers of one of my previous columns (November, 1982) will note that I used a similar program to demonstrate the speed of assembly language, but minus the print statement. I purposely left out that statement for a very good reason — the Video Display Processor is the fifteen feet of anchor chain I mentioned earlier. The TMS 9918A VDP is a Cadillac among video processors, but Cadillac's take a lot of gas. This one takes a lot of time and it is the one shackle that binds the Herculean assembly language.

The video processor is entirely "memory mapped", which means its contents are not directly available to CPU. If I were to choose the benchmark battle field on which to fight, I would pick one that entailed a minimum amount of screen reading/writing; perhaps multiply two four-digit numbers together 1,000,000 times.

However, the weapons of honor were already loaded, so I sat back and watched TI shoot themselves in the foot.

TI used the idiot benchmark to demonstrate their soon to be released computer language, Forth, and their new 99/2 computer. As a reference point, they ran the benchmark in 99/4 BASIC and I logged in a little sack time until it was finished.

Next they ran a Forth program that performed the same feat in about fifty seconds — I yawned. Then the TI rep made a statement that brought me six inches off the seat of my chair; "This is just about the same speed that the benchmark would run in assembly language". NO WAY!!!, I rudely blurted out. This evoked a surprised look from the rep, but not a rebuttal. The day after I returned home, I set out to prove that TI has a vastly different definition of the word "nearly" than I do.

## HERE WE GO WITH COUNTERS AGAIN

I set myself the lofty goal that I would get the idiot benchmark to run in under a second in assembly language. I failed.

However, I did accomplish my primary objective. I duplicated their Forth demo with a program that runs in less than three seconds. I leave it to the

reader to best me by writing the under-one-second idiot benchmark where the incrementing numbers scroll up the screen.

I'm sure many of you are groaning, "Oh no, not more of those useless counter programs. Why doesn't he give us something more useful, like the secret of bit map mode." Well, the counter program logic is a good teaching tool. These programs will show you that in spite of assembly's sterling abilities inefficient coding can really cost you in speed.

My first attempt at the idiot benchmark was to see how bad I could do. This would give me a rough idea on how hard it would be to meet my one second goal. Program #1 is a no-frills, little effort, unimaginative piece that is almost as bad as TI's Forth demo. It executes in about 45 seconds. I must say, I didn't anticipate it would be that slow — I could see I had my work cut out for me. The reason it is so slow is because it uses the built-in video subroutines. The moral is plain to see — if you really need the high speed, don't take the easy way out.

In all fairness to TI, This program is probably a fair comparison to what they did with their Forth program. However, when it comes to benchmarks the object is to write the best program possible by whatever method it takes to do the job. From this point on I had but one guideline; write a program whose output would look identical to the benchmark requirement, no holds barred.

Not being unfamiliar with the territory of counters, I knew in which direction the promised land lay. My second attempt included the improvement of scrolling the counter buffer in CPU ram rather than reading it from the screen. This showed me how little effort it took to cut the speed nearly in half; execute time was about 25 seconds.

The third attempt made a significant dent in the running time. By only printing the counter digits to the screen and not printing the remaining blank spaces, the time was cut to nine seconds. I was getting closer, but it seemed like I still had the marathon left to run. I pulled out my ace in the hole.

My VDP ace is to write directly to VDPWD — the VDP Ram Write Data register (page 268 in the editor/assembler manual). What this amounts to is eliminating the middleman (the VMRW subroutine) who collects his commission in microseconds. Believe me, those microseconds can add up quickly. I suggest you become familiar with this method, as it takes very little extra program space and is fairly simple to do. It is of special value when using bit map mode because of the large volume of

data that has to be written to VDP ram. This improvement cut the run time to five seconds — five times my desired goal. I began to sense that I wasn't going to make it.

It was time to go for broke and make one last push for the finish line. Mini-memory owners will have to drop out of the race at this point, because I resorted to the luxury of a 4000+ byte buffer. Instead of scrolling the data in the buffer, it is merely discarded. You very likely have noted this technique in BASIC, where RAM space is discarded until none is left and then the interpreter pauses to do a "garbage collection" and reprocesses the memory that was used for temporary storage. The execute time was cut to three seconds and at this point I ran out of steam. There might be a little more time to be saved, but the one-second idiot benchmark looks to be improbable. I hope one of you out there will prove me wrong, but I don't think it can be done in under two seconds.

If you want to use counters for benchmarks, use the non-scrolling type that spin madly in mid-screen. This keeps the time consuming VDP writes to a minimum.

# 10,000 COUNT SCREEN COUNTER IS BESTED!

Those of you who read my first column will remember my challenge to program a counter that could count up to 10,000 in less than three seconds. Two readers sent in correct solutions.

F. Gary Army wrote a counter that did the 10,000 in 2.8 seconds. This was bested by Jim Faust, whose counter executes in 2.3 seconds. It would seem that two seconds might be the limit to this benchmark.

Fearing my job as assembly language guru could be at stake, I rolled up my sleeves and sharpened up a pencil — these infidels had to be driven off!

My first fling at the 10,000 counter was made when I was quite green at this business — I've learned a lot since then.

I give you in program #4 a counter with 97% of the fat squeezed out of it. Its execution time for the 10,000 count is

a blinding .8 seconds — that's no typo folks, decimal eight.

Jim and Gary, the ball's back in your court and it's loaded with top spin. Now don't nickle and dime me, come up with a counter that can do the 10,000 in .5 seconds. I must share the credit with John Staron of Montoursville, Pa. John turned me on to the trick of loading programs into the 256 bytes of high speed "scratch pad RAM" (which starts at address >8300). These special bytes are hooked to a 16 bit data bus while all the other system RAM has to funnel its way through an 8 bit bus.

John is quite an expert on the 99/4 hardware. He has actually gone into his console and replaced the memory chips with an improved variety.

## PROGRAM NOTES

Programs 1-3 all use the same counter logic (the "increment counter" segments). The length could be reduced by using a loop, but the object here is speed, not aesthetics. The time savings is minimal, but every little bit helps.

Note the use of the add byte (AB) instruction. This differs from the add word (A) instruction in one important way, the least significant (right) byte does not "carry" over into its partner. E.G.: add words >01FF + >0001 =>0200; add bytes (least significant bytes) with the same two numbers and the result is >0100.

While there are many ways this counter routine could be written, I chose the direct route by doing it at character code level, using the byte values needed to print the numbers 0-9 to the screen. It would be very inefficient to merely increment a register, convert its hexadecimal contents into good old decimal and then convert that value to a character code string.

When the counter buffer (label "C1") contains ">3132, >3334", "1234" will be displayed on your screen.

The "Enable Interrupts" segment in programs 1-3 lets you exit these programs gracefully; you don't have to turn off the console power switch. After the CPU executes the "LIMI 2" (Load Interrupt Mask Immediate" instruction, it will no longer ignore the (function) "QUIT" key. Interrupts are automatically turned off when you load and run your assembly programs or when you branch to an assembly subroutine from BASIC. You must always disable interrupts when accessing VDP RAM, e.g. writing or reading the screen. If you are from the "Show me" state, replace blank line #26 in program #1 with "LIMI 2" and rerun the program. The instruction "JMP \$" is equivalent to "100 GOTO 100" in BASIC.

Are any of you puzzled over why in most statements symbolic addresses

must be preceded with an at sign (@) and in others (Load immediates [LI], Jumps, etc.) they aren't? The "at" symbol tells the assembler that the operand of the instruction is in symbolic addressing form. Perhaps an example will make this clear: "C 0, 1" compares the contents of registers 0 and 1, "C @0, 1" compares the contents of memory address >0000 with register 1, "C @0, @1" compares the contents of two memory addresses. Instructions that don't use different addressing modes don't need this indicator.

## PROGRAM #1

While a poor example of the lightning fast speed of assembly language (the program runs only four times faster than TI BASIC and only twice as fast as Extended BASIC), this program does illustrate two important points.

Compare the coding of this program with the three line BASIC idiot benchmark given earlier. It's plain to see the extra effort needed to write assembly code. If you were to buy an assembly program for \$20 as compared to the equivalent one in BASIC for the same price, you would get a far superior value — the programmer worked ten times harder writing the assembly program.

The second point to make concerns the Minimemory modifications. While you can't directly use the entire 4K of memory space for assembly programming if you are using the Line by Line assembler, you can easily use it for buffer space or data storage once your program is running. Also, you can run 4K assembly programs that have been written using the Editor/Assembler. You say you don't have an Editor/Assembler, disk drive and memory expansion? Well, you can still buy such programs and, believe me, you will get real value for your money! The "BF EQU >7100" directive will place your screen buffer into the memory area used by the Line Assembler. Of course, once your program runs it will over write the coding and you will have to reload the Line Assembler again.

## PROGRAM #2

A vast improvement over program #1. Since we have eliminated that time devouring screen read, the speed improvement is significant. Added bonus: though the program takes more instructions, it actually uses far less space than #1, since we can now cut the buffer size from 736 to 92 bytes. It will easily fit into the Minimemory without bothering the Line Assembler.

Well worth the extra programming time and the few extra bytes of memory is the technique of writing directly to

VDP memory rather than using the @VSBW or @VMBW utilities. This method is used in the "PRINT BUFFER" segment.

Line #55, "LI 0, >0E40", specifies the first screen position we wish to write: row 1, column 15. This will center the counter on the screen. "Wait a second", you sav. "How do you get that from >0E40, which equals decimal 3774? O.K., I'll explain it for those of you whose Editor/Assembler manual is still on backorder.

Since we wish to start at screen position 15, our first VDP address to write is 14 or >000E. We use 14 rather than 15 because the first VDP address is >0000, not >0001.

To tell the TMS 9918(A) chip we want to write to this address, we must set the second most significant bit to 1 >4000 equals binary 0100000000000000, and this has the proper bit set to 1. Now we add this to our desired starting address and we get >400E. To set the VDP access address, we must transfer the least significant byte (right) first. Since line #57 "MOVB 0, @8C02", is going to transfer the left byte, we may as well save a step and load register 0 with >0E40. Does this make sense?

The only matter that remains to explain is where I got >8C02 as the address that will set the VDP access address: page 266 of the Ed/Assembler manual section "VDP Access".

## 99% of the questions I get asked about assembly programming are answered in the E/A manual . . . you have to read the book.

Fortunately, the VDP memory is auto-incrementing, just like the GROM memory chips, so you only have to set the VDP access address once to write successive bytes. But since program #2 only writes four characters per screen row, a new access address must be set for each line.

The coding from lines #60-64 may seem to be out of its logical order — it is and there's a good reason. You must allow a delay between writing or reading bytes of VDP memory or you will "outrun" your video display processor. Rather than waste time with a "NOP" instruction, I chose to have the CPU do something useful, executing between writes instructions that normally would be done a bit later.

Since the "PRINT 4 DIGIT COUNTER" segment uses the @VMBW utility, a little time could be saved by rewriting it for direct VDP access. I leave this task to the reader who wants to test his understanding of this process.

## PROGRAM #3

Sorry, Minimem owners, but this program is slightly out of your reach unless you also have the memory expansion.

In the previous program, we limited our buffer space to a 92 byte recycler that had to be completely restacked for each counter print. Program #3 uses a "bulk fill" buffer that retains all 1000 counter values while only printing the largest 24 values for each successive increment of the counter. 4000 bytes may seem a bit extravagant, but in this program waste makes haste and the execution time is only about half of program #2.

Though over 60 times faster than TI BASIC, I don't feel program #3 adequately depicts the speed advantage of assembly language. Program #4, however, is a real screamer.

## PROGRAM #4

I am fond of telling people that assembly language is a thousand times faster than BASIC. I'm sure many think my claim is slightly/grossly exaggerated — mere poetic hyperbole. No one has ever asked me to back this statement up. In this program, I offer the evidence.

We now depart the arena of screen-scrolling counters and choose a dueling weapon more suited to our system's temperament — the "in-place" counter. I would love to see TI's Forth version of this program, for I seriously doubt they could make the claim that it's "Almost as fast as assembly language" with a clear conscience.

The Extended BASIC version of the in-place counter would be:

```
100 FOR X=1 TO 1000
110 DISPLAY AT(11,14):X
120 NEXT X
```

It executes in two minutes, +/- 1 sec (I can't seem to find my stopwatch). Even with a stopwatch, I would be unable to time program #4 accurately for a one thousand count — the time it took my brain to realize that the program was running and send a "start watch" signal to my hand would be too great. Even a 10,000 count would be unduly biased by my button-pushing ability.

Using a 100,000 count, program #4 times out at 1000 beats in .08 seconds, 1500 times faster than Extended BASIC!!! Perhaps I have been understating my case.

I would appreciate it if anyone could send me the time and program lists for an equivalent program on any of the other personal computers, or even for main frame systems. And I double-dare any VIC 20/G4 owners to match the 99/4. The speech synthesizer has to use this memory for it's proper functioning. Any program will show a time improvement



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by simply including the instruction "LWPI >8300" at the program's start. If only the memory expansion were filled with this "higher priced spread" and connected to the CPU with a 16 bit data bus.

I avoided using the "AORG >8300" directive to put the program into this area of memory because your computer's monitor program makes heavy use of this area. Because of the many versions of the console ROMS, even among 99/4A's, you can never be sure of what will happen to this area before your program begins running. If you need to "shoot the works" and commandeer large sections of the scratch pad RAM for use within your programs, it would be best to forgo the use of the VDP interrupt (relinquishing automatic sprite motion, auto timing of the sound generator, automatic screen blanking). In other words, don't use "LIMI 2" in your program. Because of this, you will have to turn off your console when you tire of watching program #4.

You will note two other differences between #4 and the other three programs.

Since nine times out of ten the counter needs to print one new digit, I split the increment routine into a carry and a non-carry portion. Lines #70-107 are begging to be put into loop form, but we have lots of memory and we'll do almost anything to save time.

Likewise, the print routine is split in two to avoid an unnecessary loop check when only one digit needs to be printed.

The scrolling idiot benchmark could be improved with the methods of program #4, But I'm already on an

extension of my submission deadline for this article.

I leave it to the reader to write the single-second scrolling counter.

If you happen to witness TI giving their Forth demo and they still make the claim that it is almost as fast as assembly, please be sure to correct them. Still, I will buy the Forth system when it is released (price about \$100), but all you addicts without a disk drive are SOL (Simply Out of Luck), because its disk-based.

I can't wait to get my hands on the new 99/2. With its 10.7 megahertz clock (vice the 99/4's 3 meg ticker) and it's ultra-fast screen printing, it will very likely run the scrolling idiot counter at least ten times faster than the 99/4.

Note: the TI 99/2 will be assembly language compatible with the 99/4 as their CPUs (TMS9995 and TMS9900 respectively) are both "990" family. The recently released CC40 (TMS 7000 CPU) and TI Professional Computer (8086 CPU) are non-compatible.

## ABOUT ALL THE MAIL YOU HAVE BEEN SENDING ME

I'm sorry that it's taking me so long to answer all of you, but I'm really snowed under. It is impossible to give everyone a lengthy reply, but if you enclose a stamped, self-addressed envelope, I'll try to get back to you. My mailing address is:

Bill Gronos  
9505 1/2 SE 15 #B  
Midwest City, OK 73130

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\*requires extended basic

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0001 *****
0002 * PROGRAM #1 *
0003 *****
0004
0005 * IDIOT BENCHMARK 1.0 *
0006
0007 * COUNTS FROM 1-1000
0008 * NUMBERS SCROLL UP SCREEN
0009 * EXECUTES IN 45 SEC
0010
0011 *****
0012 * MINIMEM MODIFICATION: *
0013 * REMOVE LINES 22-23 *
0014 * REPLACE "@VMBW" WITH ">6028" *
0015 * REPLACE "@VMBR" WITH ">6030" *
0016 * REPLACE LINE 24 WITH *
0017 *BF EQU >7100 *
0018 * REPLACE LINE 25 WITH *
0019 *CT EQU BF+736 *
0020 *****

0021
0022 DEF RN
0023 REF VMBW,VMBR
0024 BF BSS 736
0025 CT BSS 4
0026
0027 * INITIALIZE COUNTER CONSTANTS
0028 RN LI 4,>3A00 "10"
0029 LI 5,>3030 "0"
0030 LI 6,>3100 "1"
0031 LI 7,>0100
0032
0033 * INITIALIZE COUNTER

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```

0034     MOV 5,@CT INIT COUNTER
0035     MOV 5,@CT+2
0036
0037 * PRINT COUNTER
0038     LI 0,736
0039     LI 1,CT
0040     LI 2,4
0041     BLWP @VMBW
0042     JMP IN
0043
0044 * SCROLL SCREEN
0045 PT LI 0,32
0046     LI 1,BF
0047     LI 2,736
0048     BLWP @VMBR
0049     CLR 0
0050     LI 2,740
0051     BLWP @VMBW
0052
0053 * TEST FOR END
0054     CB @CT,6
0055     JNE IN
0056
0057 * ENABLE INTERUPTS
0058 *AND WAIT FOR "QUIT"
0059     LIM 2
0060     JMP $
0061
0062 * INCREMENT COUNTER
0063 IN AB 7,@CT+3
0064     CB @CT+3,4
0065     JNE PT
0066     MOV 5,@CT+3
0067     AB 7,@CT+2
0068     CB @CT+2,4
0069     JNE PT
0070     MOV 5,@CT+2
0071     AB 7,@CT+1
0072     CB @CT+1,4
0073     JNE PT
0074     MOV 5,@CT+1
0075     AB 7,@CT
0076     JMP PT
0077     END

```

```

0001 *****
0002 * PROGRAM #2 *
0003 *****
0004
0005 * IDIOT BENCHMARK 2.0 *
0006 * IMPROVEMENTS:
0007 *NUMBERS ARE SCROLLED
0008 *IN CPU RAM.
0009 *SCREEN IS PRINTED
0010 *DIRECT TO VDP.
0011 *LEADING ZEROS ARE REMOVED
0012 * EXECUTES IN 5 SEC
0013

```

30

```

0014 *****
0015 * MINIMEM MODIFICATION: *
0016 * REMOVE LINES 23-24 *
0017 * REPLACE "@VMBW" WITH *
0018 *"@>6028". *
0019 * REPLACE "@VMBR" WITH *
0020 *"@>6030" *
0021 *****
0022
0023     DEF RN
0024     REF VMBW,VMBR
0025     JMP RN
0026 BF BSS 92
0027 CT BSS 4
0028
0029 * INITIALIZE SCREEN CONSTANTS
0030 RN LI 4,>3A00 "10"
0031     LI 5,>3030 "0"
0032     LI 6,>3100 "1"
0033     LI 7,>0100
0034
0035 * FILL BUFFER WITH SPACES
0036     CLR 0
0037     LI 1,BF
0038     LI 2,92
0039     BLWP @VMBR
0040
0041 * INITIALIZE COUNTER
0042     MOV 5,@CT
0043     MOV 5,@CT+2
0044     JMP AD
0045
0046 * SCROLL BUFFER
0047 PT LI 8,46
0048     LI 9,BF
0049 MV MOV @4(9),*9+
0050     DEC 8
0051     JNE MV
0052
0053 * PRINT BUFFER
0054     LI 8,24
0055     LI 0,>0E40
0056     LI 1,BF
0057 PR MOV 0,@>8C02
0058     SWPB 0
0059     MOV 0,@>8C02
0060     INC 1
0061     MOV *1+,@>8C00
0062     AI 0,32
0063     MOV *1+,@>8C00
0064     SWPB 0
0065     MOV *1+,@>8C00
0066     DEC 8
0067     JNE PR
0068
0069 * TEST FOR END
0070     CB @CT,6
0071     JNE AD
0072

```



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0073 * PRINT 4 DIGIT COUNTER
0074   LI 0,717
0075   LI 1,CT
0076   LI 2,4
0077   BLWP @VMBW
0078
0079 * PRINT "DONE"
0080   LI 0,748
0081   LI 1,TX
0082   LI 2,6
0083   BLWP @VMBW
0084
0085 * ENABLE INTERRUPTS AND
0086 *WAIT FOR "QUIT"
0087   LIM1 2
0088   JMP $
0089 TX TEXT '*DONE*'
0090
0091 * INCREMENT COUNTER
0092 AD AB 7,@CT+3
0093   CB @CT+3,4
0094   JNE PT
0095   MOV B 5,@CT+3
0096   AB 7,@CT+2
0097   CB @CT+2,4
0098   JNE PT
0099   MOV B 5,@CT+2
0100   AB 7,@CT+1
0101   CB @CT+1,4
0102   JNE PT
0103   MOV B 5,@CT+1
0104   AB 7,@CT
0105   JMP PT
0106   END

0001 *****
0002 * PROGRAM #3 *
0003 *****
0004
0005 * IDIOT BENCH MARK 3.0 *
0006 * IMPROVEMENT: BUFFER IS
0007 * DISCARDED RATHER THAN SCROLLED
0008 * EXECUTES IN UNDER 3 SEC
0009
0010 * BUFFER LENGTH EXCEEDS MIMIMEM
0011 * CAPACITY
0012
0013   DEF RN
0014   REF VMBW,VMBR
0015
0016 CT BSS 4
0017 RF BSS 4010
0018
0019 * INITIALIZE COUNTER CONSTANTS
0020 RN LI 4,>3A00 "10"
0021   LI 5,>3030 "0"
0022   LI 6,>3100 "1"
0023   LI 7,>0100

0024
0025 * FILL 23 BUFFER LINES
0026 * WITH SPACES
0027   CLR 0
0028   LI 1,BF
0029   LI 2,92
0030   BLWP @VMBR FILL BF WITH SPACES
0031   LI 10,BF+92
0032   LI 11,BF
0033
0034 * INITIALIZE COUNTER
0035   MOV 5,@CT INIT COUNTER
0036   MOV 5,@CT+2
0037   JMP AD
0038
0039 * MOVE COUNTER TO BUFFER
0040 PR MOV @CT,*10+
0041   MOV @CT+2,*10+
0042
0043 * PRINT BUFFER
0044   LI 8,24
0045   LI 0,>0E40
0046   MOV 11,1
0047 PR MOV B 0,@>8C02
0048   SWPB 0
0049   MOV B 0,@>8C02
0050   INC 1
0051   MOV B *1+,@>8C00
0052   AI 0,32
0053   MOV B *1+,@>8C00
0054   SWPB 0
0055   MOV B *1+,@>8C00
0056   DEC 8
0057   JNE PR
0058   AI 11,4
0059
0060 * TEST FOR END
0061   CB @CT,6
0062   JNE AD
0063
0064 * PRINT 4 DIGIT COUNTER
0065   LI 0,749
0066   LI 1,CT
0067   LI 2,4
0068   BLWP @VMBW
0069
0070 * ENABLE INTERRUPTS
0071 *AND WAIT FOR QUIT
0072   LIM1 2
0073   JMP $
0074
0075 * INCREMENT COUNTER
0076 AD AB 7,@CT+3
0077   CB @CT+3,4
0078   JNE PT
0079   MOV B 5,@CT+3
0080   AB 7,@CT+2
0081   CB @CT+2,4
0082   JNE PT

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0083     MOVB 5,@CT+2
0084     AB 7,@CT+1
0085     CB @CT+1,4
0086     JNE PT
0087     MOVB 5,@CT+1
0088     AB 7,@CT
0089     JMP PT
0090     END

0001     *****
0002     *   PROGRAM #4   *
0003     *****
0004
0005     * THE ULTIMATE COUNTER(?) *
0006
0007     * COUNTS TO 10,000 IN .8 SECONDS
0008
0009     *****
0010     * MINIMEM MODIFICATION *
0011     * REMOVE LINES 18-19 *
0012     * REPLACE "@VMBW" *
0013     *WITH ">6028" *
0014     * REPLACE "@VMBR" *
0015     *WITH ">6030" *
0016     *****
0017
0018     DEF RN
0019     REF VMBW,VMBR
0020     JMP RN
0021     CT BSS 6
0022
0023     * MOVE PROGRAM INTO HI-SPEED RAM
0024     RN LWPI >83F0
0025     LI 1,LD
0026     LI 2,>8300
0027     LI 3,234
0028     TP MOV *1+,*2+
0029     DEC 3
0030     JNE TP
0031     B @>8300
0032
0033     * INITIALIZE COUNTER CONSTANTS
0034     LD LI 4,>3A00 "10"
0035     LI 5,>3030 "0"
0036     LI 6,>3100 "1"
0037     LI 7,>0100
0038
0039     * INITIALIZE COUNTER
0040     MOV 5,@CT
0041     MOV 5,@CT+2
0042     MOV 5,@CT+4
0043     JMP AD
0044
0045     * PRINT COUNTER DIGITS ON CARRY
0046     RS SWPB 0
0047     MOVB 0,@>8C02
0048     SWPB 0
0049     MOVB 0,@>8C02

0050     NOP
0051     RL MOVB *1+,@>8C00
0052     DEC 2
0053     JNE RL
0054
0055     * INCREMENT COUNTER
0056     AD LI 0,>1000+370
0057     INC @CT+5
0058     CB @CT+5,4
0059     JEQ ND
0060
0061     * PRINT COUNTER WITHOUT CARRY
0062     SWPB 0
0063     MOVB 0,@>8C02
0064     SWPB 0
0065     MOVB 0,@>8C02
0066     NOP
0067     MOVB @CT+5,@>8C00
0068     JMP AD
0069
0070     * PERFORM DIGIT CARRY
0071     ND MOVB 5,@CT+5
0072     AB 7,@CT+4
0073     DEC 0
0074     LI 1,CT+4
0075     LI 2,2
0076     CB @CT+4,4
0077     JNE RS
0078     MOVB 5,@CT+4
0079     AB 7,@CT+3
0080     DEC 0
0081     DEC 1
0082     INC 2
0083     CB @CT+3,4
0084     JNE RS
0085     MOVB 5,@CT+3
0086     AB 7,@CT+2
0087     DEC 0
0088     DEC 1
0089     INC 2
0090     CB @CT+2,4
0091     JNE RS
0092     MOVB 5,@CT+2
0093     AB 7,@CT+1
0094     DEC 0
0095     DEC 1
0096     INC 2
0097     CB @CT+1,4
0098     JNE RS
0099     MOVB 5,@CT+1
0100     AB 7,@CT
0101     DEC 0
0102     DEC 1
0103     INC 2
0104     CB @CT,4
0105     JNE RS
0106     MOVB 5,@CT
0107     JMP RS
0108     END

```

# USERS-GROUP SPOTLIGHT

## WASHINGTON, D.C.

The Washington, D.C. Area 99/4 Users-Group began its existence in 1980 under the sponsorship of Chafitz, an electronic specialty store, and local TI dealer. In 1980 and early 1981, a few small and informal meetings were held at Chafitz and other locations, including the headquarters of Source Telecomputing, where we were treated to a pre-release discussion (but, unfortunately, no demonstration) of Tex-Ner. Chafitz provided substantial support to our fledgling group, but early in 1981 we decided that we would prefer to have an organization independent of the store, and sent for TI's informative users group start-up kit. The kit contained useful advice concerning the administration of a local users group, and a proposed constitution and by-laws. In our first organizational meeting in April of 1981, we adopted the constitution and elected officers. In addition to our administrative actions at the meeting, we saw a demonstration of one of the first Extended BASIC modules, received (from the International 99/4 Users-Group) earlier the same day by a club member.

That first meeting, held in an elementary school near the home of our Vice-President, was attended by only nine people—primarily residents of suburban Virginia. In the next few months, however, our membership rolls grew steadily and began to include increasing numbers of 99/4 owners from the District of Columbia, Maryland, and all of northern Virginia. During this period of time, we changed our meeting place from month to month, assembling at several schools and, in one case, a Chinese restaurant. In order to accommodate our increasingly dispersed members and make it easier for prospective members to locate and attend our meetings, we appointed a committee to identify a centrally located meeting place that we could secure (inexpensively) every month. The committee was successful, and we met, with a few exceptions, at the Alexandria School Administration Building/Howard Middle School on the second Thursday of every month for nearly a year.

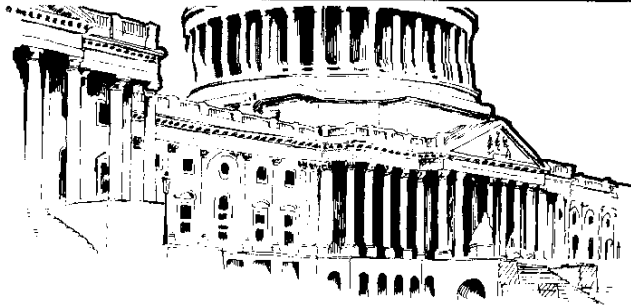
One of the first exceptions to our regular meetings in Alexandria was one of the most exciting meetings held by our users group. Speakers for the evening included Charles LaFara, President of the International 99/4 Users-Group; Brian Gratz, editor of TI's Users Newsletter; and representatives of Source Telecomputing,

who showed us how he uses a 99/4 to manage his newsletter and a mailing list of several thousand names; local TI Product Service Representatives who ran the new Peripheral Expansion System through its paces for us; and Jim Hollander, a local software developer who demonstrated his character/graphic programs. In one of our more recent meetings we featured a well-received introduction to Assembly Language lecture and demonstration presented by several of our members. Following the speakers' presentations, a typical meeting breaks into small groups where members can discuss special interests, buy and sell equipment, and copy programs from the group library.

Our dues are \$12.00/year, and benefits include a monthly newsletter and access (by mail or at meetings) to the programs in our library. The library now consists of several hundred programs contributed by members and by the International 99/4 Users-Group. Currently, we have approximately 600 dues-paying members.

We've had a lot of fun in our first two years, but we have even more excitement planned for the future. In late October we sponsored a booth at the Mid-Atlantic Computer Show at the DC Armory where we demonstrated the 99/4(A)'s capabilities and solicited new members. We are also talking with the International 99/4 Users-Group and Texas Instruments about the possibility of co-sponsoring a TI Fair and Symposium sometime during the summer of 1984.

If you happen to be planning a trip to the Washington, D.C. area during June or July 1983, the DC Area Users-Group will be holding its meetings on June 9, 1983 and July 14, 1983 and we would like to invite you to attend. If you live near DC, we hope you will take this opportunity to get acquainted with us and join the Washington, D.C. Area 99/4 Users-Group. For additional information, please call or write: Bill Whitmore, President, Washington, D.C. Area 99/4 Users-Group, P.O. Box 267, Leesburg, Virginia 22075, telephone (703)-777-2017.





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at either 10, 12 or 17 characters per inch enabling up to 136 columns to be printed on standard letter width paper. Double wide characters are software selectable and can be intermixed on a line for message highlighting. Crisp printing is assured with a long life cartridge ribbon which can be changed in seconds.

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# RETAILERS SHOWCASE

## ENTRE COMPUTER CENTER OFFERS SERVICE AND SUPPORT FOR NON-STANDARD PRODUCTS



The competition for a piece of the TI Home Computer market has become so fierce lately, that an independent retailer must either cut his margins to meet the prices that stores like K-Mart and Best Products offer, or find a niche in the market. Entre Computer Center of Lubbock, Texas has found such a niche.

"We felt there were areas in the support of the product that were not being addressed by the typical retailer" said William Games, General Manager at Entre. "We offer a wider selection of peripherals and software for the consumer than the typical retailer is willing to stock," said Games.

**Editor's note:** Entre Computer Centers is a nationwide chain of franchised computer stores. The Entre Computer Center of Lubbock is somewhat special in that the franchises are both ex Texas Instrument employees. William Games and Brian Gratz, co-owners of Entre Computer Center of Lubbock, are both well versed on the TI Family of Personal Computers and were awarded special consideration by Entre's corporate headquarters to handle the TI line.

**"We felt there were areas in the support of the product that were not being addressed by the typical retailer"**

One of Entre's services is to assemble and test all peripheral products before they are delivered. This minimizes the frustration and anxiety of assembling the product. Entre also is able to offer its clients non-TI products that give the user more flexible systems. For example, Entre can supply 99/4A users with a variety of modems and appropriate cables, ranging from simple direct connect to sophisticated programmable and high baud modems (TI is not shipping any modems at this time). In the area of disk drives, Entre can install double sided disk drives, doubling the disk capacity of the current system. Entre also offers its clients a wider choice of printers for those customers needing letter quality or faster dot-matrix printers. Entre also offers less expensive printers that use the parallel I/O interface on the Peripheral Expansion Box's RS232 Card.

With the introduction of wider printers to facilitate wider spreadsheet printouts, Entre is able to provide all of these products and the appropriate cables necessary for their operation.

Because of the heavy discounting done by mass merchandisers on the console itself, Entre focuses on bundling home computer applications into combined hardware and software "packages". Three of their most popular "packages" are:

- \*99/4A Word Processing Package
- \*99/4A Microsoft Multiplan Package
- \*TI Logo Package

These packages include all the hardware and software necessary to use the 99/4A in that particular application. When a client gets one of these "packages" the only thing necessary for operation is to plug the machine in and turn it on. Entre performs all necessary assembly and system checks.

The goal of Entre Computer Center is to get their clients up and running on their system in the least amount of time. By taking care of the hardware configuration and assembly, their clients can immediately concentrate on learning how to use the software, rather than spending the majority of their time trying to piece all the necessary peripherals together correctly.

**The goal of Entre Computer center is to get their clients up and running on their system in the least amount of time.**

Entre also offers classes on subjects such as word processing, financial planning using computerized spreadsheets (such as Micro Soft's Multiplan), and BASIC programming. These clients give both current and potential clients an opportunity to work with specific software products.

Entre Computer Center is an authorized dealer for IBM, DEC, Osborne, Televideo, and TI Home Computers. Entre is located at 4620 50th Street in Lubbock, Texas, 79414. Or call (806) 799-5400.

# CHARLIE'S PAGE



## Editorial Comment by Charles LaFara President, International 99/4 Users-Group

We hope that you have enjoyed this first edition of *Enthusiast '99*. It has been a real labor of love for us in putting it together for you. As you noticed, we have not necessarily stuck to standard magazine publishing procedures with this publication. What we have tried to do is offer our members an informative publication with a minimum of literary license. We have tried to keep our copy to advertising ratio inline and yet allow chosen advertisers to present their products in a professional manner.

*Enthusiast '99* is meant to truly be a publication for our membership. We sincerely urge that if you have any comments regarding the format, text, or editorial comment of this publication that you please let us know. We are also actively seeking programs, articles, and reports from our members for future editions of *Enthusiast '99*.

It has taken a considerable amount of help from many different people to put together the International 99/4 Users-Group and the first edition of *Enthusiast '99*. To try to thank all of them at this time would be virtually impossible and their names would certainly fill the pages of this publication. There is, however, one individual whom we would like to single out and offer our sincere best wishes to. His name, Don Bynum.

In October of 1980, Don Bynum was brought from Texas Instruments Corporate Engineering Center in Dallas, Texas to TI's production facility in Lubbock, Texas to take over the faltering 99/4 project. Sales of the 99/4 had been extremely slow and TI's corporate management was faced with either discontinuing the project or making

drastic changes in production and marketing strategies. Along with the expert help of a newly acquired marketing manager named William Turner, Don rolled up his sleeves and began to work. The first step included a re-organization of key personnel within the Lubbock facility which included bringing in several managers who Don had worked with during his 12 year career with TI.

Although Texas Instruments as a corporation has always been reluctant to change a product once it is in mass scale production, Don convinced them to scrap the 99/4 and redesign it as the 99/4A. Once this project was finished and turned over to Mr. Turner's marketing staff, sales of the 99/4A began a rapid improvement over it's older brother. As an engineer, Don quickly found ways to reduce production costs and lower the retail price of the computer to the consumer. Once this was done, TI's marketing staff had only to secure distribution to assure success.

Don's second "Baby" was the Peripheral Expansion System.

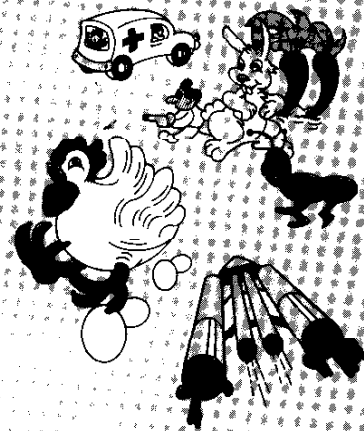
Realizing the need to create a more viable and compact system for what seemed a never ending train of peripherals for the 99/4A, he set out to give consumers a better product for less money. This project culminated in January of last year with the introduction of the Peripheral Expansion Box.

Over the past two and one half years, Mr. Bynum and his lovely wife, Peggy, have become close personal friends and supporters of the International 99/4 Users-Group and its members. It is for this reason we were saddened to hear that Texas Instruments has once again decided to promote Don to their Corporate Research and Development Division in Dallas. The leadership which Mr. Bynum showed throughout his tenure with the Consumer Product Division was not only an inspiration to his fellow employees but to all of us who he touched.

We wish Don and his family all the best in his new venture and would like to thank him for his help and support of the International 99/4 Users-Group and its membership. We have been advised that there is a possibility that Don will be involved with future personal computer products and we look forward to a continuing relationship with him.



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