
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 7 Number 6

July 1990

\$2.50

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Borders

INSIDE

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software for special purposes

Roots of polynomials in c99

Speeding up operations with
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Chaining floppy disk drives
(part 1 of a 2-part series)

Creating a line font for Page Pro

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A schedule manager for the
Geneve that runs out of Myarc
BASIC

REVIEWS

Spell-It
Interface Standard & Design
Guide for TI99/4A Peripherals

RLE+
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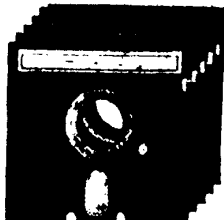


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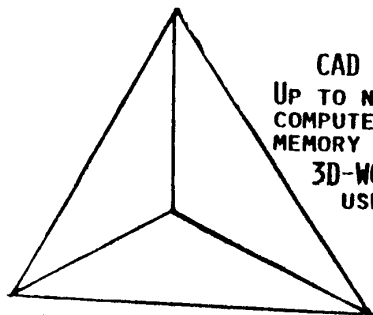
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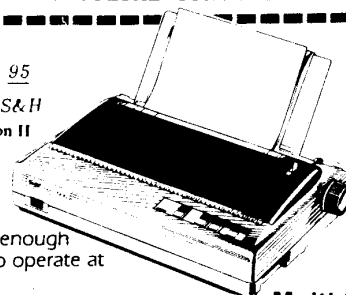
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MICROpendium

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*READ THIS

Here are some tips to help you when entering programs from MICROpendium:

1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation points at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October 1987 edition.
2. Long XBASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

THE GENEVE 9640 HAS LANDED

You will recognize it by its trade mark, a graceful gray swan swimming on blue water, an apt symbol. The ugly duckling TI no longer wanted, is no ugly duckling anymore. The GENEVE has surpassed everyones expectations, even our own; with power, speed, graphics, and adaptability not found in other microcomputers. In fact, the GENEVE does so much, this ad can only begin to tell you about it.

- **Near 100% Compatible:**

- If you have a program written in Basic, Extended Basic, XBIL, Assembly Language, Fortran, Pascal, you name it, if it runs on the 99/4A then it is near certain to run on the GENEVE.

- **32K No Wait State High Speed RAM:**

- Programs like MultiPlan, which are painfully slow on the 99/4A, run many times faster, thanks in part to the High Speed RAM.

- **V9938 Video Processor with 7 Graphics Modes:**

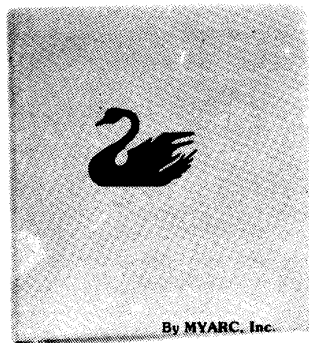
- Compatible with the 99/4A so you can use the GENEVE with the TV or monitor you are currently using. Same resolution as the Mac but with color. Faster than the Amiga, as fast as the Atari and does it with the aspect ratio something the Amiga and IBM AT can not do. As a bonus renders higher resolution, better color, and appearance, through the use of square pixels. In the high resolution mode, 256 colors may be displayed on the screen at one time by the GENEVE, eight times as many as the Amiga can display in its high resolution mode.

- **Mouse Interface:**

- The mouse interface is built in and ready to use with the MYARC mouse. But, we don't stop there, it is also ready to support the newest hardware like video digitizers, and that's just for starters.

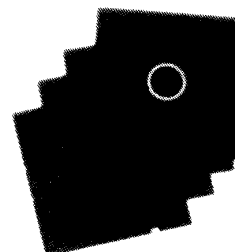
- **6 Complete Pieces Of Software Are Included With The GENEVE. But, three you will not be able to see how you ever did without are:**

- My-Word Processor; 80 columns, help screens for all modes of operation including control-U, initialize a disk without leaving the program, print formatted text to the screen for viewing before sending it to the printer and that's still not all My-Word will do.
 - Advanced Basic; the best and most powerful basic on the market today.
 - Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.



If you have heard enough, contact your MYARC dealer, they have one in stock for you. If you do not know who your stocking MYARC dealers are, or, if you want to know more about the GENEVE, telephone the number listed below, or mail your name and complete address with zip code to the address shown below. We will be happy to mail you a brochure covering the GENEVE in detail and a list of our stocking dealers. Supplies of the brochure are limited, so please hurry.

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Comments

Thanks to TI vendors

I don't know if you noticed, but Triton Products didn't put out a spring catalog. The most recent catalog mailed out by the company was last fall. It appears that Triton will now be mailing only one catalog per year, aimed at Christmas buyers.

What does this mean for Tiers?

Not a whole lot. The company is simply a marketing business. It does not develop new products nor does it go out of its way to locate new products. It is strictly run on the basis of the bottom line. I've seen mentioned in newsletters that Triton had cut back on its product support because the woman who performed those duties was going to have a baby and wasn't able to work. Baloney. Triton is a big company and big companies don't set policies on the basis of whether a certain employee is pregnant. It is simply that the TI business isn't up to snuff. Period.

Which is why I have great respect for those who have made a continuing commitment to the TI market, among them TexComp, Myarc Inc., Bud Mills Services, Texaments, Asgard Software, Rave 99, JP Software, Tigercub Software, Genial Com-

puterware, Harrison Software, CorComp (which has been taken over by International Diversified Technologies Inc.) Dijit Systems, and a handful of others. Keep up the good work.

PRESS OFFICIALLY DEAD

It should come as no surprise to anyone, but Asgard Software has listed its much ballyhooed Press word processor as Missing In Action. (Asgard shies away from declaring it dead, but it is apparent that baring some miracle it will never see the light of day.) The ambitious project never really got to a beta test stage. Too bad. It showed a lot of promise, but software development is a tricky business. Anyone who prepaid for a copy of it should have received a credit from Asgard.

FAIR 'SEASON' COMING UP

Something for all Tiers to think about are the slate of upcoming TI fairs. From September into November fairs are being held in Seattle, Portland, Chicago and Milwaukee. Fairs are a great place to meet other Tiers and buy software and hardware.

—JK

1990 TI FAIRS

FEBRUARY

TI-Fest West '90, Feb. 17-18, Day's Inn, 88 E. Broadway, Tucson, Arizona. Sponsored by Southwest 99ers. For information, call (602) 747-5046 or the Cactus Patch BBS, (602) 795-1953, check GENie or write P.O. Box 17831, Tucson, AZ 85730. For room reservations, call (602) 622-4000 by Jan. 16 and mention Fest-West.

MARCH

West Coast Computer Fair, 10 a.m.-6 p.m. March 1-4, Brooks Hall/Civic Center, San Francisco, California. San Francisco 99ers at Booth 1960. Fee \$10 per day, discounts for multiple days. Call Neil Wood, (707) 425-3854.

TICOFF (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire), 9:30 a.m.-4 p.m. March 17, Roselle Park, New Jersey. For information, call (201) 241-4550 or the TICOFF BBS (201) 241-8902.

APRIL

Canadian TI-FEST, April 28, Merivale High School, Nepean, Ontario, Canada. For information, contact Ruth O'Neill, 34 McLeod St., Ottawa, Ontario, Canada K2P 0Z5 or (613) 234-8050 or CompuServe 72117,3541 or Delphi REON.

MAY

Boston Computer Society Home Computer Fair, 10 a.m.-4 p.m. May 5, cafeteria, Waltham Central Middle School, 55 School St., Waltham, Massachusetts. Contact Justin Dowling, The Boston Computer Society, TI99 User Group, One Center Plaza, Boston, MA 02108.

Alberta TI Orphan Reunion, 10 a.m.-5 p.m. May 12, Innisfail Lions Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada T0M 1X0. Phone: (403) 638-3916.

TI Multi User Group Conference, 9 a.m.-6 p.m. May 26, Reed Hall/Student Activities Building, Ohio State University Lima Campus. For information write Lima Ohio User Group, P.O. Box 647, Venedocia, OH 45894, or call Dave Szippl evenings (419) 228-7109.

Annual Meet of TI99/4A Users Group UK, May 26, North Gate Arena, Chester, England. Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

SEPTEMBER

Seattle TI Convention, Sept. 22. Call Queen Anne Computer Shoppe

TIBBS, (206) 546-1865.

OCTOBER

Fourth Annual CPUG Computer/Electronics Exposition, 7 a.m.-3:30 p.m. Oct. 7, National Guard Armory, Palmdale, Pennsylvania. Preregistration through Aug. 3. Write Central PA 99/4A Users Group, P.O. Box 14126, Harrisburg, PA 17104-0126 or call Dave Ratcliffe (717) 238-5414 or The Data Factory BBS (717) 657-4992 or 4997 (24 hours 8-N-1 300/240).

Columbia Northwest TI Computer Fair, Oct. 27-28, Jantzen Beach Red Lion Inn, Portland, Oregon. Sponsored by NOVA (Ninety-Niners Of the Vancouver Area), Washington, and PUNN (Portland Users of Ninety-Nines), Oregon. Contact Dan Lisson, 100 E. 19th St., Ste. 300, Vancouver, WA 98663-3379, or (206) 693-7575 (voice) or (206) 687-4497 (NOVA BBS).

NOVEMBER

Eighth Annual Chicago TI International World Faire, 9 a.m.-6 p.m. Nov. 3, Holiday Inn, 3505 Algonquin Rd., Rolling Meadows, Illinois. Social mixer Nov. 2, dinner after faire. Contact Hal Shanafield, Faire Manager, Chicago TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657, or (708) 864-8644 (2-6 p.m.); hot line answering machine, (708) 869-4304; or BBS (708) 862-0182 (leave message to #162.)

Milwaukee TI-Faire, 9 a.m.-5 p.m. Nov. 4, Quality Inn, 5311 South Howell, Milwaukee, Wisconsin. Contact Gene Hitz, Milwaukee Area 99/4A Users Group, 4122, North Glenway, Wauwatosa, WI 53222.

1991 FAIRS

FEBRUARY

Fest West 91, Feb. 16-17, Ramada Main Gate, Anaheim, California. Contact Fest West 91 Committee, c/o Bill Nelson, 11692 Puryear Lane, Garden Grove, CA 92640, or call Users Group of Orange County BBS, (714) 751-4332.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Send information to: MICROpendium Fairs, P.O. Box 1343, Round Rock, TX 78680.

TI BASE

Version 3.0

More Features • More Power • More Flexibility

The best just got better... again. TI Base Version 3.0. With its massive file handling capabilities, extensive command programming language, and unmatched information processing facilities, TI Base is clearly the most powerful and flexible database system available for the TI-99/4a.

Overwhelming File Handling

TI Base supports up to five active databases. Each database can consist of 16129 records, with 17 fields per record, and 255 characters per field. Summed up, that's almost 70 megabytes of information! And using the generic conversion facility included, you can convert your present data files, from another database or TI Writer, to be used with TI Base. Now that's power... with almost no limitations!

Extensive Command Language

TI Base employs a database "engine" that is controlled by a procedural command language similar to the one used by Ashton-Tate In dBASE. The language consists of 50 different commands that allow you to access your databases on-the-fly, and create powerful program command files for automatic and complex data processing. You can even produce your own database applications!

Unsurpassed Features and Support

No other database system offers you more features, power, or flexibility, in one single package, than TI Base. In addition, TI Base is the most widely used and supported database system available. Here's a short list of some of the outstanding features found in TI Base:

- Databases can be created, deleted, restructured (without losing data), and appended to one another. Records can be added, edited, deleted, sorted, and searched for in a variety of ways.
- Free interchange of data; numerical, character, date, and local variables may be freely interchanged.
- Complete mathematical functions; arithmetic, logical, trigonometric, and Boolean functions. Numerical fields may be independently summed and averaged.
- Formatted display and printing capabilities; character manipulations, screen scrolling, color changing, and more.
- Structured command language; over 50 different commands, local variable creation, ability to nest cmd files.
- Eight level nested sort capability; sort records on multiple fields. (TI Base is also fully compatible with TI Sort.)
- Database-driven Report Generator permits reports to be created, saved and later recalled when needed. Report headers, footers and bodies may be defined. Local variables may be used from within a report.
- Disk management functions; catalog and format disks, copy and delete files from within TI Base.
- 40 column file editor to create and edit your own command (program) files from within TI Base.
- Global processing of records using simple commands or complex command (program) files.
- Command files may be executed from any device, or installed and run from high-speed VDP memory.
- System setup; allows the definition of disk locations, printer configuration, data stamping, and other misc. functions.

Not only is TI Base powerful, but it is affordable as well. For only \$24.95 (plus shipping) you get the TI Base system and tutor disks, keyboard overlay, quick reference card, and a comprehensive instruction guide. TI Base requires a disk system, 32K memory expansion, and either an Extended Basic, Editor/Assembler, or Mini Memory cartridge to operate. TI Base has been tested (but is not guaranteed) to be compatible with the Geneve 9640 (in GPL mode), all Myarc and CorComp peripheral expansion cards, and the New Horizon's RAMdisk.

Upgrade to Version 3.0

Previous owners of TI Base may upgrade to Version 3.0 for only \$14.95 (plus shipping). Anyone who purchased TI Base after March 31, 1990 is entitled to receive a free Version 3.0 upgrade. When ordering your upgrade, please include both of your original TI Base disks (the system and tutor disks) along with your upgrade fee. If you are entitled to receive a free upgrade, please include a copy of your dated sales receipt (free upgrades will not be shipped without a valid sales receipt). Please add the correct shipping charges to all upgrade orders (this includes "free" upgrades), otherwise they will be returned freight collect. All upgrade orders must be placed by mail.

TEXAMENTS

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Feedback

Discouraging words on Geneve irritate

In the May issue I read a letter from Harry Brashear which irritated me enough to put my thoughts onto paper. Brashear is another 9640-knocker who doesn't own one. He stated that anyone who moved from the TI99/4A to the IBM clone is a "fool," although he does his word processing on a Tandy (Help me, Lord!) and in his next breath he calls the Geneve "disaster-prone." Obviously Brashear wrote this letter with the same forethought he gives his reviews in MICROpendium: none. I can only shake my head in wonder at people who share Brashear's delusions. Not only does he attack a product he hasn't tested, he brags that he has just purchased the "last" of the Mechatronics cards and had "problems getting the 80-column card to work." Does this sound like a person who should be advising others what to purchase?

I can recall only one person who has purchased a Geneve and given it up to return to the TI, and this was so long ago that at the time there was no functioning operating system for the machine. *Everyone* else I have talked to would return to the TI only temporarily, if the 9640 needed repairs.

I suspect that there are hundreds of 99/4A users who would upgrade to Geneve but have read the nasty remarks made by the likes of Harry and have shied away. They may also fear having to learn all the new commands, graphic modes and procedures this entails.

They should not be afraid. We all learned to use our TIs and many of us would be glad to help them make the change. MDOS is not a complicated obstacle on the way to GPL mode. It is a handy set of utilities which, once learned, can make computing even more simple than on a 4A system, and as far as I am concerned is a better DOS than any written for the IBM or its clones. Batch files are not necessary, and you don't have to learn or write any, but once you try them you won't want to live without them.

In newsletter articles I have mentioned "bugs" in Advanced BASIC. I am not complaining, I'm reporting, and since these "bugs" are few and the power of MAB is

so great, they can be gotten around until such time as MAB is totally complete. I use the word "totally" because, as far as I am concerned, MAB is complete now! It's a wonderful BASIC, and I use it exclusively. Try it, and you will never return to the obsolete Extended BASIC.

As far as I am concerned, MDOS is also complete. It does everything I ask of it and *more* than Myarc promised to begin with. Yes, it does have a few minor and obscure problems but I rarely even think about them. The system I am typing on at this moment *never* makes me wish to return to a TI. I'm tired of people hearing only the disparaging remarks and stories about the Geneve, especially from people who have never tried one, when so much is good about it. If you buy one, you will not regret it.

Bob Sherburne
Las Vegas, Nevada

Reader defends MICROreview

I can't understand why Mr. Carmany (May 1990 Feedback) took exception to Harry Brashear's MICROreview of the Rave 99 Memory Enhancement Card.

I agree with his comment that the card is worthy of more than a MICROreview, but why take exception to Mr. Brashear's "half-a-loaf" approach? MICROpendium will undoubtedly have a full review in a later issue. Mr. Brashear was just trying to give his readers a bit of information on what appears to be a fine product that is a welcome addition to the hardware available to TI users. It is true that the MICROreviews column was originally intended to review software only, but why not have a MICROreview on hardware? Otherwise, users who may be committing themselves to the purchase of an item of hardware may find out too late that something suitable to their need is about to enter the market. A MICROreview can be used to announce new products and give users a "heads up." I would not make an investment in a piece of hardware based on a MICROreview, but I would possibly delay a purchase and wait on a full review. Much of the software discussed in MICROreviews deserves a full review, and some has had one. The

MICROreview column should continue to give these important capsules of information on new and important equipment that becomes available to the TI community.

Since I do not yet have RAG Software's Multiplan Upgrade V4.00 yet, I will not make any specific comments on your remarks except to say that you could have used the three paragraphs to *explain* how you used the RAGPATCH file rather than *complain* about the MICROreview. You may have helped a user in need of some help in using RAGPATCH.

Keep up the good work Harry!

Jim Reynolds
Martinez, Georgia

We're sure he wants to, but for this month he phoned and said he was unable to contribute a column because of a lack of materials to review — programmers and others, please change this. — Ed.

Epson-only programs decried by user

I own and use a Prowriter printer with my TI99/4A. I'm sad to find that virtually all programs are now written to make use of Epson or Epson compatible printers. Why can't these programs be written to accommodate other printers? As an example, I recently purchased Page Pro, only to find it required an Epson compatible printer. Now, if I want to print a program, I must take it to my friend who has an Epson compatible printer. What a drag. I must add that I am also loathe to spend another \$300 or more to buy another printer when my Prowriter works perfectly well.

I strongly suggest that future programs be written to accommodate other than Epson printers. If this is not possible, then how about a tutorial in one of your issues on how to change programs so they will run with various printers?

Jere Turner
Regina, Saskatchewan, Canada
For a start, check the article on printers by Jim Uzzell in the September 1989 issue. — Ed.

Feedback is a forum for TI99/4A and Geneve 9640 users. The editor will condense submissions when necessary. We ask readers to restrict themselves to one subject for the sake of simplicity. Mail Feedback items to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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BASIC

Using available software

By REGENA

I am going to deviate from my usual columns on how to program in BASIC. This month I'm going to discuss situations you may meet in which it is better not to do your own programming, and then I'll go into more detail on using a spreadsheet. Usually in business-type operations, purchasing available software would be much less expensive than developing your own — if you consider the amount of time it takes to develop custom software with all the features you want.

Even for home and educational use, or personal use, you don't want to "reinvent the wheel" for all your programs. For example, a "print shop" type of program has a reasonable cost and is much easier to use than developing your own greeting card or flyer using BASIC. Simple word processors have been written for the TI in the past, but if you really do a lot of work requiring a word processor, you are better off buying a professional package and getting all the features you need. I believe word processing is still the number one practical use for personal computers, so good word processors are available that follow industry standards (such as WordPerfect).

In the early years of home computers, many simple checkbook programs were written — programs to balance your checkbook. I never used them because I always felt personally that I could add and subtract numbers more quickly in my head than typing them into a computer. Now, however, more sophisticated programs do much more than the checkbook balance. A few months ago I purchased "Quicken" (for my IBM-compatible). Within a few evenings we had all our 1989 transactions entered (we are the unorganized types who don't balance our checkbooks until April 13 in preparation for getting our taxes in on time). Not only could we balance a year's worth of bank statements, but we could categorize our expenses so we could easily fill out our tax forms. We could actually see how much we spent on Burger King or all fast foods or even hair care for a teen-aged daughter.

In the May 1990 MICROpendium, Bill Gaskill compared four business graphing and charting programs. Here is another case where you would not want to do your own programming (reasonable cost of a program versus your own programming time). If you need to have a program to produce presentation graphics from business statistics, programs have already been written that can do the job for you.

If you have a good database program for your computer, you can keep track of all kinds of information. Sure, I've written simple name and address programs, birthday lists and even a video-cassette database, but a good database program can be customized for your own needs for any information you want to categorize. For example, when my oldest daughter got married, we used a database to set up a name and address file. We kept track of "his" list and "her" list and eliminated duplicates. We entered a checklist of when the invitations were sent, then if they were acknowledged or who attended the reception. We entered the gifts received, then the date the thank-you card was sent.

To use a database program, first the "fields" are defined. A title of the field is entered, then what type of field it is (such as numeric, integer, alphabetic) and how many characters are allowed in that field. Some databases do not allow you to change the number of fields or the type of fields, so you need to plan this carefully right from the beginning. After the fields are defined, you start entering "records." That is, you enter your actual information.

My son set up a database with baseball card dealers. The fields he defined were name, street address, city, state, Zip code, phone, type of service, quality of service, whether postage was included or not and whether a charge card was accepted. The next step was to enter a record for each dealer. Each field was filled in for each dealer. These records may be entered in any order, because the computer will do the work of sorting later.

Once the information is entered, you can *use* the database. You may display a record, modify (edit) a record, add a record or delete a record. You may search for a record. In my son's database he could ask the computer to find the record for a dealer called "Howard's." Or he could ask the computer to list alphabetically all the dealers located with a Zip code starting with "8" (western states closest to us), or Zip codes starting with "8" or "9." With a printer attached, you can then write reports. You can merge the database with a word processor, for example, to send a query letter to every dealer. You can get any kind of customized reports. For example, my son could print out a list of all the dealers, each record on a separate page, or he could print out a one-page list of all dealers who sell Topps baseball cards, accept Visa card, pay the postage and have excellent service.

Databases are not only for names and addresses. My husband set up a database of his music albums. He defined fields for type (CD, record, cassette), title of the album, artist, song (each song on the album) and owner (Dad, Mom, Rick, Cindy, etc.). Once all the information was entered, he could search for a particular song and find out which album it was on. He could print reports. For example, when birthday time comes along, he can print a list of all the CDs owned by Dad that are by Neil Diamond. Then he sends us to the store with that list so we know which ones he already has.

The spreadsheet is also one of the main applications for personal computers. I always thought a spreadsheet looked complicated, so I avoided using a spreadsheet for years. However, there are definitely times a spreadsheet is better than programming in BASIC. And, of course, spreadsheet software now is easier to use each year. A spreadsheet is similar to a database, but you can easily manipulate numbers — then print any type of report.

A couple of years ago, I published a program to calculate batting statistics (MICROpendium, May 1988). I kept separate files for each of my boys in their separate leagues. This year, my husband and I are coaching a Minor League team. I thought I would resurrect that program and make it into a team statistic program. However, I realized a spreadsheet program would be

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REGENA ON BASIC —

(Continued from Page 10)

be much more practical — and that's when I decided to share the information in this column to let you know how a spreadsheet can work if you haven't tried one before.

First the spreadsheet has to be defined. Think of a spreadsheet as a giant grid of rows and columns. Each box defined by a certain row and a certain column is called a "cell" and each cell can contain information. Some spreadsheets determine the column locations by letters, A, B, C, etc., starting from the left; and the row locations are numbered, 1, 2, 3, etc., from the top. The spreadsheet I used identified the cells by lines (rows) L1, L2, L3, etc., and columns C1, C2, C3, etc. Therefore, a cell in the third row and fourth column would be called L3C4. To define the spreadsheet, specify how many rows and how many columns will be needed.

I used 20 rows (each team member would be on one row) and 30 columns. Quite often you will use the first row for titles for the columns. The titles may be left-justified, centered or right-justified. I used the titles: Num (player uniform number), Name, G (games played), BAT (number of times at bat), RUN (runs scored), 1B, 2B, 3B, HR, RBI, KC, KS, BB, HBP, FC, E, FO, PO, OnB (number of times on base for any reason), OB A (on base percentage including by E error or FC fielder's choice), BA (batting average, which does not include bases on balls), SB (stolen bases) and fielding statistics PO, A and E.

Some of the columns of numbers are calculated from combinations of others. The HIT column is the number of hits, which is the total of 1B, 2B, 3B and HR. On Line 2, this would be the addition of Columns 6 through 9, which may be specified as L2C6+L2C7+L2C8+L2C9. On my spreadsheet, I could use the shorthand form of L2C6..C9.

The On Base column is the total of HITS plus BB (base on balls) plus HBP (hit by pitcher) plus FC (fielders choice) plus E (on base because of a fielder error). The On Base Average column is the On Base column divided by the BAT column, or L2C20/C4. The BA (batting average) column is the number of hits divided by the number of times at bat but not counting any walks. Therefore, the formula is L2C10/(C4-C14-C15).

Once the formula for each cell is listed in Line 2, you can use a REPEAT operation to repeat the calculations for each line representing a player. I repeated Line 2 down to Line 14 for all our players. I then skipped a line and formed a totals line on Line 16. The first three columns would not show a total, but then Column 4 would have a total number of times at bat. The formula for this is the sum of that column of numbers. I used the formula L2C4..L14 for the sum.

The next step is to enter the given information. From a scorebook, I entered information for each player. In the first column of cells, I entered the player's uniform number, and the second column contains the players' names. On columns that contain a calculation, I press a function key to have the spreadsheet calculate that cell value. After all the information is entered, a report may be printed. Usually a report generator allows you to choose a format and print any rows and columns you wish.

I set up another spreadsheet file to contain pitching information. I had a column for each of the standard pitching statistics and a line represents each game pitched. I had seven different boys try pitching, so I have a total line for each boy, then a grand total.

You can probably see I have had fun using a spreadsheet and a computer to help update statistics after each game. Now if only I had a lap-top . . . !

June 4, 1990 -- 9 games

Num	Name	G	BAT	RUN	1B	2B	3B	HR	HIT	RBI	KC	KS	BB	HBP	FC	E	FO	PO	OnB	OB A	BA	SB	PO	A	E
6	Kyle	7	16	3	0	0	0	0	0	2	3	2	9	1	0	0	0	1	10	.625	0.000	0	0	0	1
2	Nate	8	31	15	0	0	0	0	0	4	3	3	23	0	1	0	0	0	24	.774	0.000	2	2	2	1
10	Asa	6	12	4	0	0	0	0	0	3	1	2	9	0	0	0	0	0	9	.750	0.000	1	0	0	1
7	Bart	7	20	7	1	0	0	0	1	2	5	4	10	0	0	0	0	0	11	.550	.100	1	3	0	4
9	Dan	9	22	4	5	0	0	0	5	6	3	4	6	1	0	0	3	0	12	.545	.333	0	0	2	1
4	Stan	8	28	10	7	1	0	0	8	11	1	2	9	1	1	1	0	5	20	.714	.444	4	4	2	4
8	Joe	7	17	10	1	0	0	0	1	3	3	2	11	0	0	0	0	0	12	.706	.167	1	1	0	0
5	Randy	9	33	12	7	2	0	0	9	13	2	1	12	0	1	0	3	5	22	.667	.429	6	9	5	5
13	Jeremy	9	36	17	11	3	0	0	14	22	1	6	5	1	3	2	1	3	25	.694	.467	6	27	0	5
15	Spence	9	27	11	5	2	0	0	7	9	3	4	8	0	0	0	3	2	15	.556	.368	7	7	11	3
14	Travis	9	37	18	9	3	2	2	16	18	0	6	3	1	4	0	5	2	24	.649	.485	14	9	7	2
11	Heidi	8	28	11	4	0	0	0	4	8	4	4	12	1	2	0	0	1	19	.679	.267	0	1	0	4
12	Jared	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.000	0.000	0	0	0	0
T		9	308	122	50	11	2	2	65	101	29	41	117	6	12	3	15	19	203	.659	.351	42	63	29	31

EXTENDED BASIC

Collecting sound effects

By JERRY STERN

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Sometimes it's handy to have a doorbell within reach of the telephone. Then, when you have to discourage a caller politely, maybe the boss calling to chat about a work project, just ring that doorbell, and go answer the door. Yes, it's devious, and it also works on telephone salespeople. Rather than go run another set of wires to the front door, just tell your TI 99/4A to make a noise like a doorbell. That isn't difficult. A mechanical doorbell uses two metal plates, like those from an xylophone, and a striker, to make two resounding and fading tones. Those sounds can be duplicated with the CALL SOUND statement.

Sound effects also have other uses. The TI99/4A can send sound and video signals to a videotape recorder instead of a television set. (Just use a standard composite monitor cable, from most electronics parts stores.) Without sound, homemade titles are boring. Add background, maybe sirens, attack rifles, or a robot clanking and walking. Or maybe use sound in an adventure game, for sword fight noises, the sound of jumping off a cliff, or an exploding bomb.

Sound effects are easy to write, but time-consuming to test and fine-tune. Once an effect is finished, it will save time to place that sound effect in a subprogram, store it in MERGE format, and create a collection of sounds on disk. This month's program, SOUNDER, is a collection of sound effects subprograms to get your collection started. Besides sounds, SOUNDER also includes a menu for choosing which effect to play, and for choosing repetitions and length for those subprograms with those options built in. There is also the new subprogram REVERSE. It sets most of the screen color codes to display white characters on a blue background, but sets the colors for the small letters to blue on a white background. Small letters will then display in reverse video, and the menu routine will take advantage of that feature to display which sound is currently playing.

First, a review: CALL SOUND(duration, frequency 1, volume 1 [frequency 2,

volume 2, frequency 3, volume 3, noise #, volume]). Each sound statement can play up to three notes and one noise. The duration can range from 1 to 4,250 milliseconds, or four and one quarter seconds. If the duration is a positive number, the tone will start as soon as the TI sound chip has finished playing the previous sound, but if the duration is negative, then the previous sound will be interrupted, and the new tone will begin immediately. All the notes and the noise in each SOUND statement

lowest volumes. The sound is similar to a spinning wheel on a game show, clicking as each number passes a pointer. As the frequency of the third tone is lowered, the wheel slows down.

Other sounds can be created in simpler ways. DOORBELL (line 32295) simply plays two sets of musical chords: First, the notes E (659 cycles per second) and G (784 cycles per second) above High C are played together, and the volume is looped upward. Then, a second chord, High C (523 hertz) and E, are played and the volume looped downward to give the sound some reverberation as it fades. Notice that the duration is negative 100 hertz. That is one tenth of a second, and each tone will interrupt the previous tone as soon as the statement sends the instruction to the sound chip.

Any two musical notes that are two tones apart, like C and E, or E and G, will create a pleasant chord. (There are conversion tables for musical notes to frequencies in the Extended BASIC manual on page 197 and console BASIC manual on page III-7).

Alternatively, any two consecutive notes played together, like C and D, create a discord, or a screaming banshee. It's hard to tell them apart. The subprogram LOSER (line 28690) uses these discords to create a harsh buzzer sound for wrong answers in game programs. LOSER combines the lowest available notes A, B and C with the number three noise to create a much nastier buzzer than the usual noise three by itself.

Most computer sound effects are either tone combinations or tones in loops that change some part of the SOUND statement. WHEEL uses a loop to change the pitch of the third tone, but loops changing frequency, duration, or volume are also useful. A police siren can be created by using a frequency loop. SIREN (line 32275) blasts, at full volume zero, from 800 hertz down to 600, and back again KLAXON (line 28615) is another alarm

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The TI99/4A can send sound and video signals to a videotape recorder instead of a television set. Without sound, homemade titles are boring. Add background, maybe sirens, attack rifles, or a robot clanking and walking ... or an exploding bomb.

share the same duration.

The frequency of each tone can range from 110 cycles per second, or hertz, up to 44,733 hertz. The high end of the range is far above the scope of human hearing, but the low end is quite audible. That lowest note is the A slightly more than one octave below Middle C. Each sound has its own volume, ranging from zero (loudest) to 30 (inaudible).

A noise is indicated in the statement with a negative number, in the range from one to eight. Noises one through four sound like buzzers, and the other four sound like white noise. Noises four and eight are different from the rest. The six other noises always sound the same, but noises four and eight change their oscillation speed as the frequency of tone number three changes. The subprogram WHEEL (line 28640) demonstrates this adjustable noise. The variable periodic noise number four is matched with the three tones at their

EXTENDED BASIC—

(Continued from Page 12)

sound, and it also uses pitch changes to make noise, but KLAXON's pitch only goes up, and then restarts at a slightly higher pitch than the previous run. The effect is of a futuristic warning siren, maybe a detonation alert. The sound must play for at least thirteen seconds, and won't be truly alarming until thirty seconds have passed.

If the alarm bells send you to a cliff, JUMP (line 32345) can provide the falling sounds. It creates the sound of a running jump and a fading fall, by first increasing pitch, with volume steady, and then quickly reducing pitch and volume together.

DOORBELL uses a volume loop as a fader, and so does DOORCHIME (line 32410). This more expensive doorbell uses a chord combined with a volume loop to sound like a metallic chime. That is the difference between real musical instruments and our sound chip. When a metal chime is struck, it makes not just one tone, but several tones together, and those tones fade off evenly as the vibrations damp out. We must create each frequency separately, and fade them out manually in phases. The sounds we normally hear have distinctive patterns of decay, and it is a measure of our success in duplicating these sounds if the echo, or fade out, sounds realistic.

Sounds made by other electronic devices can be copied more easily than those from musical instruments. SONAR (line 32365) copies the sound of submarine sonar, which consists of a loud tone, and a short echo that damps out suddenly, a pause, and then a repetition of the effect.

Combinations and variations of these techniques of loops, chords, and discords can produce most sounds. GUN (line 32575) uses noise eight with different tones for an inaudible tone three, along with a loop reducing volume, to create a single gunshot sound. ATTACKGUN (line 28670) creates a multi-shot attack rifle sound in a much simpler way; it just uses noise number five. BOMB (line 32515) combines a falling pitch loop for the descent of a bomb with noise number six for the explosion. Many of these

sound effects are violent, but those are the most useful sounds for many games. And you wonder why kids love computer games?

HAMMER (line 32475) is a multi-purpose sound. Just by varying the step size in line 32485, you can change the hammer and anvil into a sword fight, using a step size of 15, or a gong with a size of one.

MOTOR (line 32330) is simply an idling motor sound. Its cyclic engine uses multiple noises, numbers five, six, and seven, to create the effect.

The ROBOT (line 28595) sounds like a pair of big, clanking, metal feet coming down a flight of stairs. This effect combines a loop reducing frequency, a loop reducing volume, a metallic second note in a chord, and a noise. The robot cannot take more than 18 steps because the pitches would go below the 110 hertz lower range of the SOUND statement.

ROBOTWAR (line 28705) simply plays all eight noises in random order, and for random durations. The effect could be an electronic battlefield, or a war between robots, or maybe this is a sound in search of a new game that will use it for something completely different.

BEE (line 32430) also uses random sounds, but this insect's flight is random by frequency and volume, not noise number.

The last three sound effects work together. DIALER (line 28410) was not always just for sounds. The subprogram creates

the touch-tone sounds of dialing a telephone. These tones are at the right pitch and length to actually be used for a phone dialer. If you have touch-tone service, then turn up the volume on the television, hold the phone up, and try it. Before I bought a modem, I occasionally used this technique when I had a lot of calls to make to long-distance companies with phone lines that were usually busy. Now, most fancy telephones have automatic redial, and more memory than most 1977-vintage computers, so DIALER has become mostly a sound effect. You can give dialer any phone number to dial, even with letters. The letters, numbers, asterisks, and number signs are all converted into touch-tones. Each touch-tone is two specific pitches played together. A standard telephone uses seven different frequencies in combined pairs, to create twelve signals.

Frequency:	1209	1336	1447
697	1	2	3
770	4	5	6
852	7	8	9
941	*	0	#

To dial one, just CALL SOUND(150,697,0,1209,0). Then the phone will ring, using the subprogram BELL (line 28390), or maybe you'd prefer a busy signal? Then just try BUSY (line 32230). Maybe you'd better call back later, when we teach the speech synthesizer to answer the phone.

SOUNDER

```

100 ! SOUNDER !195
110 ! SOUND EFFECTS COLLECTI
ON; JLS 7/90 !139
120 M$="ATTACKGUNBEE BE
LL BOMB BUSY DIA
LER DOORBELL DOORCHIMEGUN
HAMMER JUMP KLAXO
N LOSER " !235
130 M$=M$&"MOTOR ROBOT
ROBOTWAR SIREN SONAR
WHEEL QUIT" !060
140 CALL CLEAR :: ON WARNING
NEXT :: CALL REVERSE !052
150 CALL CHAR(37,"00FFFF00FF
"):: DISPLAY AT(1,3):"SOUND

```

```

EFFECTS COLLECTION" !131
160 CALL HCHAR(2,5,37,24)::
DISPLAY AT(3,6):"J. L. STERN
1990" !031
170 CALL MENU2(M$,X)!186
180 ON X GOSUB 200,220,250,2
70,290,320,360,390,410,430,4
60,480,520,540,570,610,640,6
70,700,720 !234
190 GOTO 170 !249
200 ! ATTACKGUN !069
210 CALL ATTACKGUN :: RETURN
!026
220 ! BEE !111

```

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```

230 GOSUB 740 :: GOSUB 760 !
002
240 CALL BEE(N):: RETURN !24
9
250 ! BELL !194
260 CALL BELL :: RETURN !146
270 ! BOMB !195
280 CALL BOMB :: RETURN !147
290 ! BUSY !230
300 GOSUB 740 :: GOSUB 760 !
002
310 CALL BUSY(N):: RETURN !1
13
320 ! DIALER !084
330 DISPLAY AT(12,17):"NUMBE
R TO" :: DISPLAY AT(13,17):"
DIAL?" !144
340 ACCEPT AT(14,17)SIZE(11)
:D$ !182
350 CALL DIALER(D$):: RETURN
!251
360 ! DOORBELL !246
370 GOSUB 770 :: GOSUB 760 !
033
380 CALL DOORBELL(N):: RETUR
N !133
390 ! DOORCHIME !061
400 CALL DOORCHIME :: RETURN
!018
410 ! GUN !141
420 CALL GUN :: RETURN !092
430 ! HAMMER !093
440 GOSUB 770 :: GOSUB 760 !
033
450 CALL HAMMER(N):: RETURN
!234
460 ! JUMP !223
470 CALL JUMP :: RETURN !175
480 ! KLAXON !112
490 GOSUB 740 :: DISPLAY AT(
15,17):"(OVER 12)" :: GOSUB
760 !045
500 IF N<13 THEN 490 !035
510 CALL KLAXON(N):: RETURN
!253
520 ! LOSER !040
530 CALL LOSER :: RETURN !24
9
540 ! MOTOR !052
550 GOSUB 740 :: GOSUB 760 !
002
560 CALL MOTOR(N):: RETURN !
192
570 ! ROBOT !041
580 GOSUB 740 :: DISPLAY AT(
15,17):"(UNDER 19)" :: GOSUB
760 !119
590 IF N>19 THEN 580 !133
600 CALL ROBOT(N):: RETURN !
181
610 ! ROBOTWAR !019
620 GOSUB 740 :: GOSUB 760 !
002
630 CALL ROBOTWAR(N):: RETUR
N !162
640 ! SIREN !036
650 GOSUB 770 :: GOSUB 760 !
033
660 CALL SIREN(N):: RETURN !
176
670 ! SONAR !038
680 GOSUB 770 :: GOSUB 760 !
033
690 CALL SONAR(N):: RETURN !
178
700 ! WHEEL !024
710 CALL WHEEL :: RETURN !23
3
720 ! QUIT !230
730 STOP !152
740 DISPLAY AT(12,17):"HOW M
ANY" :: DISPLAY AT(13,17):"S
ECONDS?" !062
750 RETURN !136
760 ACCEPT AT(14,17)VALIDATE
(DIGIT)SIZE(4):N :: RETURN !
203
770 DISPLAY AT(12,17):"HOW M
ANY" :: DISPLAY AT(13,17):"R
EPEATS?" :: RETURN !077
28280 SUB MENU2(A$,X)!178
28285 ! A$ IS LIST OF OPTION
S, EACH N CHARACTERS LONG; J
LS 5/90 !109
28290 ! X : RETURN VARIABLE;
DISPLAYS CHOICE ON MENU IN S
MALL LETTERS, USE WITH SUB R
EVERSE !170
28295 N=9 :: FOR L=1 TO LEN(
A$)/N+.9 !124
28300 DISPLAY AT(4+L,1-(L<10
)):L;SEG$(A$, (L-1)*N+1,N)!11
1
28310 NEXT L !226
28320 DISPLAY AT(5,17):"CHOI
CE?" !079
28330 ACCEPT AT(6,17)VALIDAT
E(DIGIT)SIZE(2):X :: IF X=0
OR X>20 THEN 28330 !061
28335 S$="" :: FOR L=(X-1)*N
+1 TO MIN(LEN(A$),(X*N)):: C
=ASC(SEG$(A$,L,1))!177
28340 IF C>64 AND C<91 THEN
C=C+32 !144
28345 IF C=32 THEN C=127 !20
2
28350 S$=S$&CHR$(C):: NEXT L
!078
28355 DISPLAY AT(4+X,1-(X<10
)):X;S$ !107
28360 SUBEND !168
28365 SUB REVERSE !140
28370 ! SWITCHES DISPLAY TO
WHITE ON BLUE FOR CAPS, BLUE
ON WHITE FOR SMALL LETTERS;
JLS 5/90 !224
28375 CALL SCREEN(5):: FOR L
=0 TO 8 :: CALL COLOR(L,16,1
):: NEXT L !114
28380 FOR L=9 TO 12 :: CALL
COLOR(L,1,16):: NEXT L !143
28385 FOR L=13 TO 14 :: CALL
COLOR(L,16,1):: NEXT L :: S
UBEND !231
28390 SUB BELL !140
28395 ! TELEPHONE BELL SOUND
EFFECT JLS 7/90 !244
28400 FOR L=1 TO 8 :: CALL S
OUND(-10,659,0,784,2):: CALL
SOUND(50,659,6,784,8):: NE
XT L :: CALL SOUND(50,659,8,1
84,10)!178
28405 SUBEND !168
28410 SUB DIALER(A$)!242
28415 REM AUTO DIALER-JLS 7/
90 !201
28420 ! FOR NUMBERS, LETTER
*,#; ENTER NULL STRING TO I
EDIAL LAST ENTRY !159
28425 DIM N(35)!119
28430 IF A$="" THEN 28500 !
70
28435 L=LEN(A$)!177
28440 FOR C=1 TO L :: P$=SE
$(A$,C,1):: AP=ASC(P$)!019
28445 IF (AP<48)+(AP>57)THE
28455 !059
28450 N(C)=VAL(P$):: GOTO 2
495 !006
28455 IF AP=35 THEN N(C)=10
:: GOTO 28495 !043
28460 IF AP=42 THEN N(C)=11
:: GOTO 28495 !042

```

(See Page 15)

EXTENDED BASIC—

(Continued from Page 14)

```

28465 IF AP>90 THEN AP=AP-32
!137
28470 IF (AP=81)+(AP<65)+(AP
>89)THEN 28490 !018
28475 IF AP<81 THEN 28485 !0
52
28480 AP=AP-1 !156
28485 N(C)=INT((AP-65)/3)+2
:: GOTO 28495 !248
28490 N(C)=12 !233
28495 NEXT C !217
28500 FOR C=1 TO L !132
28505 IF N(C)=12 THEN 28520
!189
28510 ON N(C)+1 GOSUB 28530,
28535,28540,28545,28550,2855
5,28560,28565,28570,28575,28
580,28585 !206
28515 FOR D=1 TO 40 :: NEXT
D !195
28520 NEXT C !217
28525 SUBEXIT !167
28530 CALL SOUND(150,941,0,1
336,0):: RETURN !139
28535 CALL SOUND(150,697,0,1
209,0):: RETURN !146
28540 CALL SOUND(150,697,0,1
336,0):: RETURN !147
28545 CALL SOUND(150,697,0,1
447,0):: RETURN !150
28550 CALL SOUND(150,770,0,1
209,0):: RETURN !138
28555 CALL SOUND(150,770,0,1
336,0):: RETURN !139
28560 CALL SOUND(150,770,0,1
447,0):: RETURN !142
28565 CALL SOUND(150,852,0,1
209,0):: RETURN !139
28570 CALL SOUND(150,852,0,1
336,0):: RETURN !140
28575 CALL SOUND(150,852,0,1
447,0):: RETURN !143
28580 CALL SOUND(150,941,0,1
447,0):: RETURN !142
28585 CALL SOUND(150,941,0,1
209,0):: RETURN !138
28590 SUBEND !168
28595 SUB ROBOT(N)!175
28600 ! ROBOT COMING DOWN N
STEPS, NOT MORE THAN 18 STEP
S, JLS 7/90 !178
28602 IF N>18 THEN SUBEXIT !
028
28605 FOR L=1000 TO 1050-N*5
0 STEP -50 :: FOR LL=1 TO 30
STEP 2 :: CALL SOUND(-99,L,
LL,L+110,LL,-5,LL):: NEXT LL
:: NEXT L !088
28610 SUBEND !168
28615 SUB KLAXON(N)!247
28620 ! FUTURISTIC ALARM KLA
XON, SOUNDS FOR N SECONDS, N
OT LESS THAN 13 SECONDS JLS
7/90 !133
28622 IF N<13 THEN SUBEXIT !
022
28625 FOR L=0 TO N*4 STEP 50
:: FOR P=3 TO 25 STEP 1 ::
FOR M=110 TO L+110 STEP P !1
04
28630 CALL SOUND(-99,L+M,2):
: NEXT M :: NEXT P :: NEXT L
!074
28635 SUBEND !168
28640 SUB WHEEL !227
28645 ! WHEEL OF FORTUNE, SL
OWING DOWN, JLS 7/90 !251
28650 CALL SOUND(2000,440,30
,330,30,610,30,-4,0)!235
28655 FOR L=610 TO 150 STEP
-40 :: CALL SOUND(99,440,30,
330,30,L,30,-4,0):: NEXT L !
021
28660 CALL SOUND(2000,440,30
,330,30,150,30,-4,0)!234
28665 SUBEND !168
28670 SUB ATTACKGUN !020
28675 ! ATTACKGUN: MULTISHOT
AUTOMATIC WEAPON FIRE SOUND
EFFECT, JLS 7/90 !249
28680 FOR L=1 TO 5 :: CALL S
OUND(-200,-5,3):: CALL SOUND
(100,-5,10):: NEXT L !085
28685 SUBEND !168
28690 SUB LOSER !243
28695 ! LOSER: 'You Lose!' s
ound effect, 1.5 seconds, JL
S 7/90 !202
28700 CALL SOUND(1500,110,1,
117,1,123,1,-3,1):: SUBEND !
124
28705 SUB ROBOTWAR(N)!156
28710 ! SOUNDS OF ROBOTS BAT
TLING FOR N SECONDS, JLS 7/9
0 !106
28715 FOR L=1 TO N*2 :: CALL
SOUND(RND*1000,-INT(RND*8)-
1,3):: NEXT L !113
28720 SUBEND !168
32230 SUB BUSY(N)!107
32235 ! BUSY SIGNAL SOUND EF
FECT FOR N SECONDS:JLS 9/198
5 !096
32240 FOR L=1 TO N :: FOR T=
1 TO 2 !085
32245 CALL SOUND(400,233,2,2
62,2):: CALL SOUND(99,9999,3
0):: NEXT T :: NEXT L !122
32250 SUBEND !168
32275 SUB SIREN(L)!168
32280 ! SIREN SOUND EFFECT F
OR L*2 SECONDS JLS 9/85 !150
32285 FOR T=1 TO L :: FOR N=
600 TO 800 STEP 10 :: CALL S
OUND(-200,N,0):: NEXT N !021
32290 FOR N=800 TO 600 STEP
-10 :: CALL SOUND(-200,N,0):
: NEXT N :: NEXT T :: SUBEND
!086
32295 SUB DOORBELL(N)!127
32300 ! DOORBELL SOUND EFFEC
T RUNG N TIMES JLS 9/85 !214
32305 FOR L=1 TO N :: FOR V=
0 TO 16 STEP 2 :: CALL SOUND
(-100,659,V,784,V+5):: NEXT
V !187
32310 FOR V=0 TO 16 STEP 2 :
: CALL SOUND(-100,523,V,659,
V+5):: NEXT V :: NEXT L :: S
UBEND !047
32315 SUB BOMB !141
32320 ! BOMB DESCENT AND EXP
LOSION SOUND EFFECT JLS 9/85
!049
32325 FOR S=659 TO 220 STEP
-15 :: CALL SOUND(-200,S,3):
: NEXT S :: CALL SOUND(-1000
,-6,0):: SUBEND !092
32330 SUB MOTOR(N)!186
32335 ! MOTOR NOISE SOUND EF
FECT FOR N SECONDS JLS 9/85
!234
32340 FOR L=1 TO N*8 :: FOR
F=-5 TO -7 STEP -1 :: CALL S
OUND(-99,F,0):: NEXT F :: NE
XT L :: SUBEND !119
32345 SUB JUMP !169
32350 ! SOUND EFFECT OF A RU
NNING JUMP JLS 9/95 !171
32355 FOR F=210 TO 510 STEP
50 :: CALL SOUND(20,F,0):: N
EXT F !242
32360 FOR F=510 TO 210 STEP

```

(See Page 16)

EXTENDED BASIC—

(Continued from Page 15)

```
-8 :: CALL SOUND(-5,F,(510-F
)/10):: NEXT F :: SUBEND !01
6
32365 SUB SONAR(N)!172
32370 ! SONAR SOUND EFFECT F
OR N*1.5 SECONDS JLS 9/85 !2
52
32375 FOR L=1 TO N*2 :: CALL
SOUND(100,440,0):: FOR Y=1
TO 3 :: CALL SOUND(1,440,14)
:: NEXT Y :: CALL SOUND(500,
330,30):: NEXT L :: SUBEND !
034
32410 SUB DOORCHIME !012
32415 ! DOORCHIME SOUND EFFE
CT JLS 11/85 !218
32420 FOR A=0 TO 30 STEP 5 :
: CALL SOUND(-99,698,A,1924,
```

```
A,3772,A):: NEXT A !237
32425 FOR A=0 TO 30 STEP 5 :
: CALL SOUND(-99,554,A,1527,
A,2994,A):: NEXT A :: SUBEND
!018
32430 SUB BEE(N)!243
32433 !PLAYS BEE OR PLANE SO
UND EFFECT FOR N SECONDS !09
9
32436 RANDOMIZE :: I=INT(RND
*10+1)!218
32439 FOR L=1 TO N :: J=INT(
RND*10+1):: FOR V=I TO J STE
P -1*(J>I)+1*(I>=J)!040
32442 F=INT(RND*2)+115 :: SN
=SGN(RND-.5):: CALL SOUND(-5
00,-3,10,F+SN,V):: NEXT V ::
I=J :: NEXT L :: SUBEND !09
9
```

```
32475 SUB HAMMER(N)!228
32480 ! HAMMER(STEP=5), GONG
(1) OR SWORDFIGHT(15) SOUND
EFFECT, REPEATED N TIMES, JLS
11/85 !061
32485 FOR L=1 TO N :: FOR A=
0 TO 30 STEP 5 :: CALL SOUND
(-99,400,A,1300,A,3000,A)::
NEXT A :: CALL SOUND(300,330
,30):: NEXT L :: SUBEND !145
32575 SUB GUN !086
32580 ! GUN SOUND EFFECT SIN
GLE SHOT JLS- 12/85 !152
32585 CALL SOUND(100,110,0,1
30,5,34000,30,-8,0):: FOR L=
0 TO 30 STEP 15 :: CALL SOUN
D(-100,110,30,110,30,3400,30
,-8,L):: NEXT L :: SUBEND !1
42
```

TRIALS OF A c99 BEGINNER

Roots of polynomials

By CHARLES E. KIRKWOOD JR

I remember when Clemson University bought its first digital computer in the very early 1960s. It used typewriter and/or paper tape for input and output. It had a large impressive console with blinking lights. It was fast! Fast? By what standards? Faster than my calculations on the desk calculator, but still not as fast as my TI 99/4A computer is today. It had a lot of memory, 8000 words of 32 bits each (a total of 32K bytes), but no disk or magnetic tape drives. Again, this is not as much as my TI 99/4A. The algebraic language compiler was on paper tape and was fed into the computer prior to a program. The program could either be typed in or fed in on a punched tape. The process was multi-pass in which the intermediate storage was paper tape which had to be fed back in.

One day the computer was on, but no program was running. When the attractive young secretary started rewinding the paper tape the typewriter started printing. She stopped and the typewriter stopped. She started again and the typewriter started again. When she stopped, the typewriter stopped. 'Tis remarkable what the static electricity of a "highly-charged" young lady can do to a computer! (She never again rewound the tape near the computer.)

Elmer Clausen, who wrote mathematical subroutines for LGMA Products FORTRAN Compiler sent me a new version of Tom Bentley's 'C' Floating-Point Library. This new version takes care of some of the problems that I had, not having enough digits in a floating-point number. Time can be saved when you are working on a program by compiling and assembling this

library separately into an object file and giving it a file name such as **FLOAT** which can be linked to your program at the proper time.

The two programs this month make use of some of the functions in previous articles. The complex functions are grouped together into one library file called **CMPLX**, which includes the functions **fgetc0**, **fsepc0**, **fputc0**, **fcnc0**, and **fcmpl0**. A description of these functions was in the April 1989 issue. The square root function, **sqrt0**, is discussed in previous issues. Generally, we will not use all of the mathematical functions in a program. To conserve memory, most of my mathematical functions are stored in individual source files. The function **sqrt0** is stored in file **SQRT**. In both programs the input and output is in **main0** and the calculations are in functions so that the functions can be stored in your Mathematical Library for future problems.

The first program is a familiar one that all of us had in high school algebra, the quadratic formula: x equals minus b plus or minus the square root of b squared minus 4 times a times c , all divided by 2 times a , where a , b , and c are the coefficients of a quadratic equation. The value under the radical is called the *discriminant*. When it is zero, the roots are real and equal; when it is positive, the roots are real and unequal; and when it is negative, the roots are complex. The function **fputc0** prints out the complex roots if they exist. The variable **kis** is an integer code to determine the type of printout — 0 for real roots and 1 for complex roots. Since integers cannot be returned by way of arguments and parameters, write the function statement in the program

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TRIALS OF A c99 BEGINNER—

(Continued from Page 16)

```
k=quadeq(a,b,c,x);
```

The second program to find a real root of a polynomial uses part of the program to evaluate a polynomial and its derivative which was in the April issue. An approximation to the root is input and Newton's formula, $x1 = x - f(x)/f'(x)$, is used, where x is the approximation, $f(x)$ is the value of the polynomial at x , $f'(x)$ is the derivative of the polynomial at x , and $x1$ is a better approximation. This first approximation can be obtained by running one of the previous polynomial programs. As you may remember from your calculus, the first derivative of a curve is the slope. The absolute value of the relative difference between $x1$ and x is calculated. Substitute $x1 = x$ and continue this operation as long as the absolute value of the relative difference is greater than some predecided value, in this case **0.000001** is chosen. The absolute value of the relative difference is $abs((x1-x)/x1)$. If $x1$ is zero, do not divide by $x1$. In the program, r (for result) is used instead of $x1$.

Newton's formula is developed from the algebraic formula for the slope of a straight line between two points (x,y) and $(x1,y1)$. The slope equals the difference of the y s divided by the difference of the x s. A tangent line to the polynomial is drawn at the point (x,y) and crossing the x -axis at point $(x1,y1)$ ($y1$ will be zero here). The derivative at point (x,y) is the slope of the polynomial at that point, which is also the slope of the tangent line. This is called yp (for y' or $f'(x)$).

```
yp = (y1-y)/(x1-x)
let y1 = 0
yp = -y/(x1-x)
yp(x1-x) = -y
x1-x = -y/yp
x1 = x-y/yp
```

Hopefully, the root will converge to a point near the initial input. But sometimes it won't, this depends upon the shape of the curve. When the roots are very close together there may be a problem. Another problem can arise if yp is zero. Dividing by

zero results in an overflow. The tangent line is horizontal here and will not intersect the x -axis. You might run this program many, many times for different curves and may never encounter this, but it can happen. I have never had it happen until I was testing out a polynomial for this program. What do you do about it? Well, I just made y/yp equal to 1 (one) and went on — it worked! Hope it will always work. The problem repeats itself so that additional roots might be obtained.

When there are no real roots the function `newton()` will get into an infinite loop. A counter is installed and when the number of iterations is greater than 50 a number **99999** is given to r and we return to the main program. We do not want to print out that number as a root, so if $r=99999$ print "**Does @not @converge**", otherwise print the value of r . So often in programming we do not always take into consideration all that can happen.

Link CSUP and FLOAT to both of your compiled and assembled programs.

Please change the function name `poly` (line 33 in April c99 program) to `fpoly`.

Typing a program into the computer can help in learning a programming language. However, after a person has learned the language, this typing can be more of a chore and mistakes are likely to be made. These mistakes can sometimes be hard to find since we read what we meant to type and not what actually was typed. When space permitted, MICROpendium has included both the source c99 program and the ready-to-run program using E/A 5 on their monthly disks.

You may obtain my Mathematical Functions Library and at least 10 ready-to-run c99 programs that have appeared in MICROpendium by sending to me two disks (SSSD) or one disk (DSSD or SSDD), a self-addressed label and return postage. Some of the functions and programs have been revised since they appeared in the magazine. My address is Box 1241, Clemson, SC 29633-1241. I appreciate hearing from readers and welcome suggestions and corrections.

POLYNOMIALS

```
/*Program No. 1*/
/*Solution of a Quadratic Equation*/
#include DSK1.FLOAT1
#include DSK1.SQRT
#include DSK1.CMPLX
main()
{
    float a[8],b[8],c[8],x[2][8],mo[8];
    int k;
    char s[30];
    itof(-1,mo);
    puts("Input quadratic equations coefficients\n");
    fpget(s,a);
    fpget(s,b);
    fpget(s,c);
    k=quadeq(a,b,c,x);
```

```
puts("\nRoots:\n");
if(k==0)
{
    fpput(&x[0][0],s);
    putchar(10);
    fpput(&x[1][0],s);
}
else
{
    fputc(x,s);
    fexp(mo,"+",&x[1][0],&x[1][0]);
    putchar(10);
    fputc(x,s);
}
```

```
quadeq(a,b,c,x)
float a[],b[],c[],x[2][8];
{
    float disc[8],den[8],f[8],t[8],ac[8];
    float bb[8],sd[8],mo[8],mb[8];
    float y[8],z[8],mdisc[8];
    int k;
    itof(4,f);
    itof(0,z);
    itof(-1,mo);
    fexp(mo,"+",b,mb);
    fexp(f,"+",a,ac);
    fexp(c,"+",ac,ac);
    fexp(b,"+",b,bb);
    fexp(bb,"-",ac,disc);
```

(See Page 18)

TRIALS OF A c99 BEGINNER—

(Continued from Page 17)

```

fexp(a,"+",a,den);
if(fcom(disc,">=",z))
{
    k=0;
    sqrt(disc,sd);
    fexp(mb,"+",sd,&x[0][0]);
    fexp(&x[0][0],"/",den,&x[0][0]);
    fexp(mb,"-",sd,&x[1][0]);
    fexp(&x[1][0],"/",den,&x[1][0]);
}
else
{
    k=1;
    fexp(mb,"/",den,&x[0][0]);
    fexp(mo,"*",disc,mdisc),
    sqrt(mdisc,y);
    fexp(y,"/",den,&x[1][0]);
}
return(k);
}

/*Program No. 2*/
/*Real roots of a polynomial*/
#include DSK1.FLOAT1
#include DSK1.CONV
main()
{
    int i,n;
    char s[15];
    float a[10][8],p[8];
    float x[8],r[8];
    stof("99999",p);
    puts("Input degree of polynomial ");
    n=atoi(gets(s));
    puts("Input coefficients\n");
    for(i=0;i<n;++i)
        fpgget(s,&a[i][0]);

```

```

for(i=1;i<n;++i)
{
    puts("\n\nInput approximation to root ");
    fpgget(s,x);
    newton(n,a,x,r);
    if(fcom(r,"==",p))
        puts("\nDoes not converge\n");
    else
    {
        puts("\nRoot = ");
        fpput(r,s);
    }
}

/*Polynomial evaluation*/
fpoly(n,a,x,y)
int n;
float a[][8],x[],y[];
{
    int i;
    fcpy(&a[0][0],y);
    for(i=1;i<n;++i)
    {
        fexp(x,"*",y,y);
        fexp(y,"+",&a[i][0],y);
        fcpy(y,&a[i][0]);
    }
    return;
}

/*Newton's Method for Root of Polynomial*/
newton(n,a,x,r)
int n;
float a[][8],x[],r[];
{
    int i,j,m;
    float b[10][8],t[8],er[8],rel[8];

```

```

float y[8],yp[8],z[8],mo[8],p[8];
itof(0,z);
stof(".0000001",er);
stof("99999",p);
itof(1,rel);
itof(-1,mo);
m=n-1;
j=1;
while(fcom(rel,">=",er))
{
    for(i=0;i<n;++i)
        fcpy(&a[i][0],&b[i][0]);
    fpoly(n,b,x,y);
    if(fcom(y,"==",z))
    {
        fcpy(x,r);
        return;
    }
    fpoly(m,b,x,yp);
    if(fcom(yp,"!=",z))
        fexp(y,"/",yp,t);
    else
        itof(1,t);
    fexp(x,"-",t,r);
    fexp(x,"-",r,rel);
    if(fcom(r,"!=",z))
        fexp(rel,"/",r,rel);
    if(fcom(rel,"<",z))
        fexp(rel,"*",mo,rel);
    ++j;
    if(j>50)
    {
        fcpy(p,r);
        return;
    }
    fcpy(r,x);
}
return;
}

```

MY-BASIC

Schedule manager keeps track of events, appointments

By JIM UZZELL
©DDI Software

By special arrangement with DDI Software, MICROpendium is publishing MY-Schedule, an appointment calendar for use with MYBASIC V2.99A. (Use of the program requires a double-sided disk.) MY-Schedule is comprised of two programs: A setup program, which is listed this month, and the schedule pro-

Programs included in this column require MY-BASIC Version 2.99A and MDOS 1.14F or 0.97h. They will not work with MY-BASIC 2.99. For a copy of 2.99A, 1.14F and 0.97h, send \$5 to MICROpendium MBASIC, P.O. Box 1343, Round Rock, TX 78680. (Specify disk format.)

(See Page 19)

MY-SCHEDULE—

(Continued from Page 18)

gram, which will be published next month.

Here is the documentation for both programs:

To get started: Type the programs in using MY-Word and "SAVE C PF DSKx.FILENAME," then check total and verify the checksum. Then load into MY-BSAIC by entering "OLD DSK1.FILENAME." This is a new operation for MY-BASIC; no more "exlating" a program, then save as a program. If you have made a mistake that MY-BASIC recognizes, it will tell you.

Now, initialize a disk as double-sided, single-density or double-sided, double-density using SCH-DATA as the volume name.

Load the setup program and place SCH-DATA in drive A, and follow screen instructions.

After that is finished, you will have created the SCH-DATA data disk. The

Opening Screen																																					
C A L E N D A R																																					
Change Day -UP/DN	Change Month -LT/RT	Appointments -Enter		APP/Event -P)rint Month		-Quit																															
A P P O I N T M E N T S																																					
Month <__>SAVE	Events -CTRL E	Delete Line -CTRL L	Notes -CTRL N	Print Day -CTRL P	Line -UP/DN	Day -LT/RT	-ESC																														
<table><tr><th>Keystroke</th><th>Result</th></tr><tr><td>- <__></td><td>Appointments</td></tr><tr><td>-CTRL D</td><td>Delete Char</td></tr><tr><td>-CTRL</td><td>DeleteLine</td></tr><tr><td>-UP/DN</td><td>ChangeLine</td></tr><tr><td>-LT/TR</td><td>Change Page</td></tr><tr><td>-ESC</td><td>Calendar</td></tr></table>			Keystroke	Result	- <__>	Appointments	-CTRL D	Delete Char	-CTRL	DeleteLine	-UP/DN	ChangeLine	-LT/TR	Change Page	-ESC	Calendar	<table><tr><th>Keystroke</th><th>Result</th></tr><tr><td>- <__></td><td>Save Month</td></tr><tr><td>-CTRL A</td><td>Appointments</td></tr><tr><td>-CTRL P</td><td>Print Day</td></tr><tr><td>-CTRL E</td><td>Events</td></tr><tr><td>-UP/DN</td><td>Change Line</td></tr><tr><td>-CTRL D</td><td>-CTRL L</td></tr><tr><td></td><td>-ESC</td></tr></table>					Keystroke	Result	- <__>	Save Month	-CTRL A	Appointments	-CTRL P	Print Day	-CTRL E	Events	-UP/DN	Change Line	-CTRL D	-CTRL L		-ESC
Keystroke	Result																																				
- <__>	Appointments																																				
-CTRL D	Delete Char																																				
-CTRL	DeleteLine																																				
-UP/DN	ChangeLine																																				
-LT/TR	Change Page																																				
-ESC	Calendar																																				
Keystroke	Result																																				
- <__>	Save Month																																				
-CTRL A	Appointments																																				
-CTRL P	Print Day																																				
-CTRL E	Events																																				
-UP/DN	Change Line																																				
-CTRL D	-CTRL L																																				
	-ESC																																				

Commands available in MY-Schedule.

schedule program looks for this disk by volume name.

For commands available in the schedule program refer to the chart that accompanies this article. The program also has a

command menu on screen.

Since the schedule program is in GRAPHICS MODE 3,3 some colors may not be displayed properly if you are using a composite monitor.

MY-Schedule Setup Program

```

100 CALL GRAPHICS(2,1)
110 DIM ML(12),WP(12),FT$(12)
120 DIM TMS$(14) :: CS$=CHR$(147)
130 ES$="<"&CHR$(95)&">" :: Q$=CHR$(34) :: SP$=CHR$(32)
140 DA$=CHR$(96) :: FOR L=2 TO 37 :: DA$=DA$&CHR$(96) :: NEXT L
150 UL$=CHR$(95) :: FOR L=2 TO 28 :: UL$=UL$&CHR$(95) :: NEXT L
160 FOR L=1 TO 12 :: READ MO$(L),ML(L) :: NEXT L
170 FOR L=1 TO 31 :: TS$="" :: IF L<10 THEN TS$="0"
180 NMS$(L)=Q$&T$&SEG$(STR$(L),1,2)&SP$&Q$ :: NEXT L
190 C=7 :: FOR L=1 TO 14
200 Z$=SEG$(STR$(C),1,2) :: IF C<10 THEN Z$=SP$&Z$
210 TMS$(L)=Q$&Z$&"00" :: C=C+1 :: IF C>12 THEN C=1
220 NEXT L :: TS$="A"&SP$ :: FOR L=1 TO 14
230 TMS$(L)=TMS$(L)&T$&Q$ :: I

```

```

F L=5 THEN TS$="P"&SP$
240 NEXT L
250 CALL CLEAR
260 INPUT "WHAT YEAR IS THIS SCHEDULE FOR i.e. 1990 ":Y
270 IF Y<1802 OR Y>2398 THEN 260
280 ML(2)=28-((Y/4=INT(Y/4) AND Y/100<>INT(Y/100)) OR Y=2000)
290 FOR M=1 TO 12 :: SY=Y :: SM=M
300 IF SM<3 THEN SM=SM+12 :: SY=SY-1
310 T=INT(SY*1.25)-(SY<1900)-(SY>2000)*INT((SY-2000)/100)+INT((SM-2)*2.59)
320 WP(M)=T*1-INT(T/7)*7
330 FT$(M)=SEG$(MO$(M),1,3)&SEG$(STR$(Y),3,4)&"SP"
340 NEXT M :: CALL CLEAR
350 L=1 :: GOSUB 490 :: F$="S" :: GOSUB 540
360 DISPLAY AT(10,7):"CREATING ";SEG$(F$,1,1)&" C H E D U L E D A T A"
370 OPEN #2:"DSK1."&FL$ :: F

```

```

OR L=1 TO 31 :: PRINT #2:NMS$(L)
380 NEXT L :: FOR L=1 TO 12 :: PRINT #2:FT$(L)
390 PRINT #2:MO$(L) :: PRINT #2:ML(L) :: PRINT #2:WP(L) :: NEXT L
400 FOR L=1 TO 14 :: PRINT #2:TMS$(L) :: NEXT L :: TS=Q$&Q$
410 PRINT #2:DA$ :: PRINT #2:UL$ :: PRINT #2:CHR$(124)
420 PRINT #2:Y :: CLOSE #2
430 FOR L=1 TO 3 :: CALL CLEAR
440 FOR M=L*4-3 TO L*4 :: F$=FT$(M)
450 DISPLAY AT(10,9):"CREATING ";SEG$(F$,1,5)&" APPOINTMENT DATA"
460 GOSUB 540 :: OPEN #2:"DSK1."&FL$
470 FOR N=1 TO (ML(M)*19)+60 :: PRINT #2:T$ :: NEXT N
480 CLOSE #2 :: NEXT M :: NEXT L :: CALL CLEAR :: END
(See Page 25)

```



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A TI FIRST! THE BIOGRAPHIES OF EVERY U.S. PRESIDENT ON TWO DISK SIDES. GREAT FOR SCHOOL, TRIVIA AND HISTORY BUFFS.
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The TEX-COMP Freeware program is a disk distribution service which is operated to support the TI-99/4A user and programmer and to keep the TI-99/4A the best value in the computer world. The nominal charge (\$4.95) that is charged for each title is for distribution services only and includes the cost of duplication, premium grade disks, labels, advertising and packaging including plastic disk cases that we include at no extra cost with orders of four or more disks. When a program requires more than one disk side, we supply a floppy or even a second disk at no extra cost. The programs we distribute come from all over the world and are either public domain or the author has expressly agreed to freeware distribution or has placed the program into freeware distribution by providing it to a commercial bulletin board service.

#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK

This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoloader.

#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER

Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it!

#3. DUMPT

This disk helps you transfer many TI modules to disk. Recommended for users with some programming ability. Ed/Assembler and "widget" recommended.

#4. PRINTART

Two disk sides filled with files that print out great quality pictures on most printers. Many famous TV and comic characters on this disk. "Beam me up Scotty."

#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME

This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-II module.

#5A. TI MUSIC/GRAPHICS

A great collection of music and matching graphics. Great examples of music & sprite programming.

#6. EXBASIC MUSIC

A two disk side collection of music & graphics that we consider some of the best.

#7. SPACE SHUTTLE MUSIC/GRAPHICS

One of the real outstanding examples of programming. This disk has it all. Great graphics, music, and continuity. A real salute to the space program. It is almost like watching a movie!

#8. LOTTO PICKER

This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 6 etc games. A great learning and fun disk.

#9. MONA LISA PRINT OUT

This disk prints out a near photo quality picture of that lady with the classic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

#10. GOTHIC PRINT

This disk lets you type out a phrase on the screen and then print it out in gothic (Old English) style. Looks like hand-lettered calligraphy. Use for invitations, announcements and business cards.

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"

This disk was actually originally sent to TEX-COMP as a greeting from master programmer Ray Kazner. It was just too good not to share! One of the best examples of computer animation and graphics you will see on any computer!

#12. TI-99 OLOPY

This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

#13. STRIP POKER (PG RATED)

Play Poker against your TI-99/4A. When you win a hand she loses--a piece of her clothes that is. Don't worry about being a lousy poker player. Another file is included where you don't even have to know an ace from a king.

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#14. FIGURE STUDY (PG RATED)

A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

#15. STAR/EPSON PRINTER DEMO

This 2 sided disk contains a large collection of demo programs to put your Star/Epson compatible printer through its paces. Learn what control codes can do! Lots of text and graphics examples. Second side has a great tutorial on printer graphics with examples!

#16. SIDEWAYS PRINTOUT

This program allows you to print out the material from your printer sideways. Great for spreadsheets, banners and large graphics. Second side contains some new enhancements for Multiplan not available on the TI upgrade.

#17. TI FORTH DEMO

This demo disk was released by TI to show the power of Forth. Fantastic music and graphics. Ed/Assem and 32K required!

#18. TI DIAGNOSTIC

This program loads into the Mini-Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

#19. TI WRITER/MULTIPLAN UPGRADE

This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other enhancements. Easy to use, just substitute new files for old! Instructions included.

#20. ACCOUNTS RECEIVABLE

This self contained prize winning program loads and runs in Exbasic and has all the features found in a professional accounting system. Complete with documentation and a second disk side with report generating programs.

#21. DATA BASE DEMO DISK

A professional data base program that was originally written to store various magazine articles from computer magazines and then find them by name, subject, key word, or publication. Fast, easy to use and easy to adapt for other applications. Come complete with sample data to make learning data base processing easy. Completely menu driven and unprotected.

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#22. ASTROLOGY

This one is as good as anything you will see in an arcade. Great color graphics and displays of the Zodiac. Enter your birthdate and learn about your sign, your lucky days and famous events in history on your birthday. Even prints out a report. Can be used as a great money-maker at a charity event. Help guide your spouse's career.

#23. WILL WRITER

Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but better check that out!

#24. ENGINEERING CALCULATIONS

A two sided computer handbook of dozens of the most often used engineering and technical formulas. A real time saver. Does conversions, calculations and even designs electrical circuits. A must for anyone whose profession or hobby involves scientific calculations. Even has medical and communications applications.

#25. MEDICAL ALERT

This disk contains many menu accessible files covering most everyday medical emergencies. A good "what to do until the doctor or paramedic comes" guide. Well written and organized. Could very easily save a life!

#26. R RATED GAME

It was bound to happen. A talented (but demented) programmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 13 to order this one!!

#27. KIDS LEARNING

An educator in Georgia put this two sided disk collection of educational programs together. Contains great material. Math, geography, reading improvement, and even IQ testing. All high quality programs for kids of all ages.

#28. LOADERS AND CATALOGERS

We put together a collection of the best programs that catalog and load a group of programs on a disk. Just try them, pick the one you like and transfer it to another disk with the file name LOAD and you are in business.

#29. LABEL MAKER I

Two great programs for making custom labels for disks, addresses, video tapes or any other application. Even contains a graphic display of the TI-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels.

#30. HOUSEHOLD BUDGET PRINTOUT

With this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming job.

#31. MORSE CODE TRAINER DISK

This disk has everything you need to learn and practice Morse Code for the various FCC license exams. It also is great for scout groups and school "ham" clubs for group training and merit badge qualification. Professional quality.

#32. EXBASIC XMAS MUSIC

Two disk sides full of high quality xmas music that can be played throughout the holiday season and then used as a learning tool since it contains wonderful arrangements and graphics. Autoloading and menu driven.

#33. CHECKERS & BACKGAMMON

A collection of great checkers and backgammon games for the TI-99/4A. These are professional in quality and will keep you busy for hours.

#34. SOLITAIRE & SCRABBLE

Another collection of classic games for the TI-99/4A. Exbasic & 32K req.

#35. PROGRAMMING AIDS & UTILITIES I

A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

#36. STRICTLY BUSINESS

A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk sides filled with financial and business related programs.

#37. LAPD COOKBOOK

This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great recipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen.

#38. GREAT 99/4A GAMES VOL. I

A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II

Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

#40. ARTIFICIAL INTELLIGENCE

This disk contains the famous computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm programs so you can analyze all your emotional problems at one sitting.

#41. VIDEO GRAPHS MODULE BACKUP DISK

This disk is a backup of the discontinued Video Graphs Module from TI. For legal reasons, it can only be purchased for backup use by owners of the original module. Do not order UNLESS you have the original module and intend to use this disk only for backup purposes. Exbasic autoloading.

#42. FUNNELWEB FARM UTILITY

You heard about this one, now direct from Australia is the latest version of this fantastic utility that puts everything at your command. From one program you can access word processing, editor assembler, telecommunications and just about everything else. A freeware program complete with documentation on a second disk side.

#43. BEST OF BRITAIN, VOL I

Now for the first time, a collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

#44. LABEL MAKER I GRAPHICS

A disk filled with graphics for the Label Maker I disk (#29). Dozens of great graphics for custom labels!

#45. BEST OF BRITAIN, VOL II

This disk contains an outstanding 3-D graphics adventure game for the TI-99/4A. Carfax Abbey lets you actually move through a four story mansion complete with bats and vampires. You actually are placed in each room and go up and down stairs and through secret panels. Legend of Zelda...look out!

#46. SUPER TRIVIA 99

A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

#47. INFOCOM RAPID LOADER

If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.

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#48. GHOSTMAN (from England)
This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

#49. DEMON DESTROYER (from France)
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

#50. OH MUMMY (from Germany)
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

#51. BERLIN WALL (from Canada)
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.

#52. ANIMATION 99 (from Germany)
THIS IS THE ONE!!! A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism than on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

#53. HACKER/CRACKER
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.

#54. ASTRONOMY
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!

#55. SCREEN DUMP
This program allows you to dump disk and even module programs to a Star/Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.

#56. SPREAD SHEET
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59. GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.

#60. FREDDY
A fantastic game where you guide this hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOC
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way...graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoloader.

#69. COMPUTER PLAYER PIANO/KEYBOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections.

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.

#73. CRYPTO (gram)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.

#77. MICROdex 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.

#78. ARTCON+ BY RAY KAZMER
ATTENTION GRAPHX AND TI ARTIST USERS!!! This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.

#79. DM1000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80. BIRDWELL DISK UTILITY
A must if you are into programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

#83. HOME APPLICATION PROGRAMS
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone.

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Ray Kazmer has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY

Written by 99/4 programming great Charles Ehninger, this prize winner originally sold for \$59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE 1990 KBGB GIRLIE CALENDAR

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This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN

Two bible games (non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV

This disk features the works of J. Peter Hoddie. All of these games are of commercial quality and well worth the donation requested!

#100. ASSULT THE CITY (T. of DOOM)

An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE

This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

#102. COLOSSAL CAVES ADVENTURE

This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

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This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY

This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+

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Ken Gilliland's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

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Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbelievable collection of fantastic aids to make the best even better!

#109. TI-WRITER MINI MANUAL

This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

#110. DISK + AID

A powerful disk sector editor formerly sold for \$20. Menu Driven and easy to use.

#111. POP MUSIC & GRAPHICS

This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

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#117. UNIVERSAL DISASSEMBLER

This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

#118. FAST TERM

One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASC11, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A.

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The original BITMAC is now available at \$4.95 with all original documentation. A powerful graphics program for the 4A which lets you print where you want, even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A must for anyone into 99/4A graphics. Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

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THE TI-BASE USER'S GUIDE — 2

Speeding up TI-Base operations

By BILL GASKILL

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Last month we talked about speeding up the loading process for the TI-Base program, which I defined as the time that it takes to get from initial start up to the prompt for Today's Date. After you have entered the date the SETUP file is read by TI-Base as a default function and then the dot prompt appears. But in between the date and the appearance of the dot prompt, which is where you want to be in order to use the program, there is also some time to be saved.

As I stated, the SETUP file is always the first file read by TI-Base, as a default function. However, you don't really have to have it. Although a "file does not exist" error message will appear at the dot prompt, you can completely eliminate the SETUP file by renaming it or leaving it off of your working copy of the program disk. Any parameter or function performed in SETUP can be recreated from the dot prompt. As delivered, SETUP contains eight lines of code that don't do anything more than set the cursor speed and display messages. Virtually all of the parameters that one normally uses in TI-Base SETUP operations already have default values that can be used as is. SETUP is really only a professional convenience, put there to meet user-specific needs.

If you don't care to eliminate SETUP you can edit it down to a single line or make each of the default lines in the file comments. Either of these options will save you time in getting the program to the dot prompt. If you wish to save SETUP

with your own values and parameters, you can also edit it to eliminate some of the more time consuming operations that it performs.

In all versions beginning with V2.0 and above, a PRINTER driver data base is accessed through SETUP that takes as much as 10 seconds to read on a floppy

...the SETUP file is always the first file read by TI-Base, as a default function. However, you don't really have to have it. ... you can eliminate the SETUP file by renaming it or leaving it off of your working copy of the program disk.

disk. Reading of the PRINTER data base, which contains the escape codes for any special modes or fonts required by your particular printer, can easily be by-passed if you don't intend to do any special printing during the current session.

To do so, simply call the SETUP file into the command file editor with a MODIFY COMMAND DSK#.SETUP, where the pound sign is the number of the drive that the TI-Base program is booted from. Once the SETUP file is on screen press Fctn 2 to insert and then type in an asterisk in front of the line that reads; PRINTER (your printer name). This will make the command that activates the PRINTER data base into a comments line so that it is by-passed by the command file interpreter. Press Fctn 8 to save the changes to the PRGDISK and you are done. You will still

be able to print from within TI-Base. You just can't use any of the special print modes or fonts found in the PRINTER data base. When you want to activate the special printer features, simply select an empty slot and then type in PRINTER (your printer name) and the PRINTER data base will be opened, read and then closed all with that one command from the dot prompt.

After you get to the dot prompt there are several things that you can do to speed up operations. If you operate the program directly from the dot prompt, rather than through the command file mode, you will find that anything you do works faster. Use of the command file mode invokes the command

file interpreter, which is among the biggest offenders in slowing down the TI-Base program. But the command file mode does have some advantages from the dot prompt too. Aside from its ability to support the creation of complex code for user-specific programming needs, it can also be used to automate recurring functions that you perform, thus saving you typing time. I discovered early on in my TI-Base experience that it was easier to create short-named, one-line command files out of things like the CATALOG, DISPLAY, FORMAT and LIST functions, than it was to have to type the function in each each time I wanted to use one. Once created a simple DO CAT for the CATALOG function or DO DIS for the DISPLAY function got things rolling in no time. Try it, you'll like it.

MY-SCHEDULE—

(Continued from Page 19)

```
490 PRINT "INSERT DATA DISK
IN DISK DRIVE #1"
500 PRINT :: PRINT "PRESS <S
PAGE BAR> TO CONTINUE."
510 CALL KEY(0,K,S) :: IF S=
0 THEN 510
520 CALL CLEAR :: RETURN
530 OPEN #2:"DSK1."&FL$ :: C
LOSE #2 :: RETURN
```

```
540 FL$=F$
550 RETURN
560 END
570 DATA JANUARY,31,FEBRUARY
,28,MARCH,31,APRIL,30
580 DATA MAY,31,JUNE,30,JULY
,31,AUGUST,31,SEPTEMBER
590 DATA 30,OCTOBER,31,NOVEM
BER,30,DECEMBER,31
0 1310 2398 1729 2806 3496 3
```

```
579 2764 2641 2875 1326 2821
2729 2295 2741 609 858
3497 1821 3441 1943 2194 415
2 1386 2762 1466 2370 3957 3
332 2668 3854 3303 3112
1514 1765 1943 4016 2025 303
1 3176 2840 3301 2170 1550 2
637 534 698 434 3100
3267 2865 TOTAL 123101
```

Chaining Disk Drives

Tips on adding external floppy drives to your system

By MERLE VOGT

This is the first of a two-part series on connecting external floppy disk drives to the TI.—Ed.

The TI99/4A Peripheral Expansion Box usually came with only one disk drive unit installed in it. That unit was configured to operate in the standalone mode. The TI disk control system controller board, PHP1240, was capable of managing three disk drive units. TI had anticipated expansion to include more drives and had started producing external hardware to carry the added drives, but not much had come onto the market at the collapse.

There are two key factors about disk drive control that must be set up to use a drive as standalone or as a unit in a chain connection, with drive No. 2 or drive No. 3.

For introduction, I recommend that you review an article about chaining drives that appeared in the December 1988 MICROpendium (Pages 27-30, by Larry Thompson). He introduces the types of problems on connecting extra drives. He covers very well material on Shugart and Teac units. However, note that he overlooked one item about the Shugart resistor pack, which I only discovered when I got a factory manual on this drive. (This will be considered in next month's installment in a discussion about the Side 0 Select signal.)

SHUNT PACK DISCUSSION

Most drives have a *DIP socket* (dual in-line package) wherein is plugged a jumper header called the *shunt pack*. On many drive boards there is printed, near this socket, some data about the function of each jumper. However, the data differs widely, in a manner to confuse you, between the various drive makers. Also, the socket may have 14 or 16 pins.

A disk drive could not easily be built so that it could be plugged into the system in turnkey fashion. There are a number of operating options that must be programmed on a drive to make it fit electrically, and the shunt pack is the programming device.

I will run down the most common labeling schemes and try to clarify some of the

mess that you will find. Note that the various drive builders have not conformed too well to a neat system of naming and locating the control signals on the DIP socket pins.

Pin 1: May be called HL, or HS, or H. This circuit programs for the *head load* by control of the drive select signal. (See pins 2, 3, 4 and 6 below.) Jumper connects Pin 1 to Pin 14, or Pin 16.

WARNING: The confusion goes all the way on the labels, as you will see. Watch out for the differences between 14- and 16-pin models.

Pin 2: May be called DS0 or DS1. This is drive select for the first drive unit in the system. The jumper connects Pin 2 to Pin

reversed. Pin 5 becomes select No. 4 and Pin 6 becomes MX. This flipping is not important if you use one to three drives. The Shugart 450, Tandon TM100-2A, and Tandon TM100-4 are all so connected. I believe that the rest of the drives I tested are standard. (See Fig. 1.)

Pin 7: Labeled MH, or HM or M. This is for *head load by the motor on signal*. This is an option to use instead of head load by drive select, per Pin 1, above. Jumper is Pin 7 to Pin 8.

WARNING: Do not use both Pin 1 and Pin 7, only one should be connected. (On drives with a 16-pin DIP socket this MH signal is usually placed at Pin 8, and Pin 7 is not connected, so the jumper will be on Pin 8 to Pin 9. Further, all those numbers for pins 1-6 will connect to pins 16, 15, 14, 13, 12, 11, etc., as noted above. Watch out!)

I have no idea about the best choice for using the Pin 1 jumper, HL; or the Pin 7 jumper, HM; for the head load. I have observed that almost every used drive coming in my hands has been jumpered for Pin 1, HS. This has seemed to work okay on every drive I have run.

The Pertec FD200 drive does not have a shunt pack socket; rather it is Switch S-1, called unit select which must be set to enable drive No. 1, or whatever.

On many of the newer, double-sided drives, the manufacturers may scatter these control signals all around the circuit boards instead of locating them in one convenient spot. Beware of Panasonic and Mitsubishi, for example. I have been able to get a Mitsubishi to run. I have never been able to decode the mess presented by Panasonic.

The OKI GM-3315 seems to have normal labels but it is all placed on DIP switches to configure the options.

VARIATIONS

Here I must warn you that all this nicestuff about the shunt only applies to some drives. Note that Mitsubishi, Panasonic, Pertec, QumeTrak, Remex, Tandon TM 65 and Teac do not use a DIP socket

(See Page 27)

Drives tested for this article

Drive Name	Model
Magnetic Peripherals	BR8B1A
Mitsubishi	M4851-362U
MPI	51 & 52
Pertec	FD200
Qumetrak	142
Remex	RFD480
Shugart	400L, per rA1
Shugart	450, per 5A2
Siemens	82
Siemens	FDD 100-5
Tandon	TM65-2
Tandon	TM100-2A
Wangco	82, per 5B

13, or Pin 15. Do not put a jumper on pins 3, 4 or 6 of that drive.

Pin 3: May be DS1 or DS2. This is drive select for the second unit in the chain. Jumper is Pin 3 to Pin 12, or Pin 14. No jumper on pins 2, 4 or 6.

Pin 4: May be DS2 or DS3. Drive select for the third drive unit in the system chain. Jumper Pin 4 to Pin 11, or Pin 13. No jumper to pins 2, 3 or 6.

Pin 5: Labeled MX or X. Meaning multiplex, but usage is not known to me. Do not jumper it.

Pin 6: May be DS3 or DS4. Drive select for fourth unit in chain. Jumper is Pin 6 to Pin 9, or Pin 11. No jumpers to pins 2, 3 or 4.

WARNING: Watch out on pins 5 and 6. On some drives these functions are

Tokens and programs that write programs

By **BOB CARMANY**

Late in 1988 Jerry Stern came up with an interesting little program called LINE-SAVER that extracted and saved chunks of Extended BASIC code to be used as sub-routines. One of the areas that was briefly covered in the article and program as the idea of CHR\$ token values saved in "crunch" format in a D/V 163 MERGE file. Of course, there have been partial lists of the CHR\$ tokens published from time to time and they have been used to create programs that write other programs. The idea of creating a program to write code as a D/V163 file that can be MERGED into memory or with existing programs leads to almost endless possibilities. If only there was a list of what the CHR\$ values above CHR\$(127) represented in "crunch" form. With that idea in mind, I set out to see what I could do about providing a usable list.

To be of any real value, the final list almost had to be in a D/V 80 format that could be manipulated by TI-Writer or Funnelweb so it could be easily printed. I quickly discovered that characters above CHR\$(127) aren't printable as token values in a D/V 80 file. So, we had to trick to computer into thinking that it was writing a bona fide MERGE program and go from there. The final result wasn't the best programming effort, but here it is anyway. PROGRAM DESCRIPTION

The first four program lines are simple. Basically, they clear the screen and present the program title, and display the author's attribution. Next, a prompt appears for the output filename and the

appropriate disk file is opened. No problem, so far.

The next line sets A\$ equal to "=" with a space on either side and then blanks out the line used to enter the disk file name. Line 150 sets the loop parameters from CHR\$(32) to CHR\$(255). By changing these values, one could print out any range of character or token values. Line 160 checks to see what the current value of TOK (the character value and line number) and displays the appropriate message on the screen. If the value is less than 127 (a printable character), the "CHARACTER" message is displayed. Otherwise, the "TOKEN" message appears. The current character value is also displayed.

Line 170 is the algorithm for printing the information to the disk file (see Jerry Stern's article in the January 1989 MICROpendium). In this case, the line number and the CHR\$ value are the same because we are using the same value. The line number is followed by A\$ and then the actual value of the character string. The computer has been tricked into creating a "program" starting at line number 32 and extending to line 255 with the corresponding character strings for each. Line 180 increments the loop to the next character and line number.

The next line sends the end of file marker when the loop limit is reached and line 200 physically closes the file and begins the display of the final instructions. If you follow these instructions, you will have a D/V 80 file that can be manipulated and printed with TI-Writer and Funnelweb. You will find, however, that some of the lines have

"garbage" immediately following the "=". You can delete it and print the CHR\$ value and "=".

If you wish, you may look at the intermediate D/V 163 file before you LIST it to disk and get some idea of what your D/V 80 file will look like. Here is the entire program with checksums

```

100 CALL CLEAR :: ON WARNING
NEXT !042
110 DISPLAY AT(2,2):"CHARACT
ER AND TOKEN LISTER" :: DISP
LAY AT(4,7):"By R.M. Carmany
" !207
120 DISPLAY AT(14,1):"FILENA
ME: DSK1." :: ACCEPT AT(14,1
4)BEEP VALIDATE(UALPHA,DIGIT
,".")SIZE(-12):FNS !018
130 OPEN #1:"DSK"&FNS,VARIAB
LE 163 !114
140 A$=" " :: DISPLAY AT(1
4,1):RPT$(" ",28)!153
150 FOR TOK=32 TO 255 STEP 1
!043
160 DISPLAY AT(16,12):TOK ::
IF TOK<127 THEN DISPLAY AT(
11,6):"LISTING CHARACTER" EL
SE DISPLAY AT(11,5):"LISTING
TOKEN VALUE" !240
170 PRINT #1:CHR$(INT(TOK/25
6))&CHR$(TOK-256*INT(TOK/256
))&A$&CHR$(TOK)&CHR$(0)!007
180 NEXT TOK !132
190 PRINT #1:CHR$(255)&CHR$(
255)!084
200 CLOSE #1 :: DISPLAY AT(1
7,1):"Type 'NEW' to clear me
mory " :: DISPLAY AT(19,1):
(See Page 28)

```

CHAINING DISK DRIVES—

(Continued from Page 26)

shunt. Rather, the signals are scattered around on the drive's PC board as groups of little pins sticking up and are patched with tiny individual jumpers that each fit over just two pins.

RESISTOR PACKS

The disk control board in the PEB is constructed in such way that the disk drives

must energize several signal control lines to enable them for the control board. The earliest, and best, scheme was to feed each with +5 volts through a 150-ohm series resistor. The specific circuits involved were: *Write Gate*, *Write Data*, *Step*, *Direction*, *Motor On*, plus *Side Select* on double-sided drives. Some drives also had door detect.

But in this area, also, there is what I call total disorganization. There are at least three different internal configurations of resistor packs, which also be found in 14- and 16-pin versions. Next month I will examine this mess, and note which drives used each, and try to untangle it; at least as far as I can from the drives I have been able to get my hands on.

TOKENS—

(Continued from Page 27)

```
"and MERGE DSK"&FN$&" and" !
162
210 DISPLAY AT(21,1):"then L
IST 'DSKx.filename'" :: DISP
LAY AT(23,1):"to create a D/
V 80 file" :: FOR DELAY=1 TO
1000 :: NEXT DELAY :: END !
208
```

Here is one more program that might be of interest. It may be true that an Extended BASIC program can't read another Extended BASIC program, but there is more than one way to extract lines from a program. I believe that the author of this little beauty is Craig Miller, who marked Explorer, DISKASSEMBLER, etc. The program uses CALL PEEK to look into the line number table in memory expansion (line 1), calculates the range of lines to be extracted based on user input, and

finally extracts the lines by effectively deleting everything else (line 6). If you examine the calculations, you will see that the algorithm for calculating line numbers in this program is similar to the previous program, and Jerry Stern's program as well.

The advantage of this extraction program is that the result is an Extended BASIC program that can be immediately added to, resequenced, or otherwise used without merging from disk. However, you may output the extracted lines to a disk file for later use, if you wish. It doesn't have the "creature comforts" of Stern's program.

```
1 CALL CLEAR :: CALL INIT ::
INPUT "LINE NUMBERS OF ROUT
INE TO BE SAVED: FIRST, LAST?
":L,M :: G=256 :: CALL PEEK(
-31952,H,I,J,K)!202
```

```
2 C=INT(M/G):: D=M-C*G :: F=
(J-G)*G+K :: FOR E=(H-G)*G+I
TO F STEP 4 :: CALL PEEK(E,
A,B):: IF A=C AND B=D THEN 4
!201
3 NEXT E :: PRINT "LINE";0;
"NOT FOUND!" :: STOP !@P- !2
19
4 H=INT(E/G):: I=E-(G*H):: H
=H+G :: C=INT(L/G):: D=L-C*G
:: FOR E=E+4 TO F STEP 4 ::
CALL PEEK(E,A,B):: IF A=C A
ND B=D THEN 6 !@P- !025
5 NEXT E :: PRINT "LINE";N;
"NOT FOUND!" :: STOP !@P- !0
48
6 E=E+3 :: J=INT(E/G):: K=E-
(G*J):: J=J+G :: CALL LOAD(-
31952,H,I,J,K):: STOP !@P- !
161
```

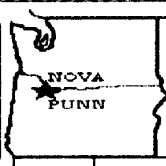

To use this program, SAVE it in MERGE format on disk. Then, when you want to extract a chunk of lines, load your target program and MERGE this program into it and type RUN and follow the prompts. If you plan to extract more than one group of program lines, SAVE your target/extractor program after they are merged, since it will have to be rerun. Also, you will have to SAVE each group of lines before you can process the next group, since nothing will remain in memory except the extracted lines. Enjoy both of the programs!

Online tutoring available on GENIE network

The GENIE online consumer information service has added the online tutoring and continuing education services of the Computer-Assisted Learning Center to its menu of online service offerings. CALC, based in East Rochester, New York, offers educational services provided by an experienced staff from across the nation who teach and work in their local schools.

The CALC Tutoring Center is a national tutoring and homework help center for students of all ages. The CALC Course Center offers structured continuing education, self-enrichment and college-level courses for credit run in four quarters throughout the year. Students may study toward associate's and bachelor's degrees from Edison State College, New Jersey.

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Creating a new line font for Page Pro

By ROGER PRICE

The instructions listed here will help anyone who uses Page Pro to create a line font, specifically the line font illustrated in Fig. 1.

First, take the Page Pro program disk and copy the file LNCHARS_LN onto a work disk, preferably a newly formatted work disk. Change the name to BORDER1_LN.

Now, load a sector editor program and use it to locate your work file sectors. With Advanced Diagnostics, use the command FF BORDER1_LN. (FF means to Find File, and the disk should be in drive 1.) If you used a newly formatted SS/SD disk, it should show the file to be at sectors 34 and 35. If you use Funnelweb, select No. 5 Disk Patch. Search for BORDER1_LN on drive 1, and it should show the file at sectors 22 and 23. I have not been able to figure out why the two programs return different sector numbers, but if you stick with one program it does not matter. Write down the sector numbers where the file is located. If you used a newly formatted disk and have only the BORDER1_LN file on it, you will find that the sectors immediately preceding and following the file are

filled with E5. As you can see, BORDER1_LN is only two sectors long.

Because of copyright restrictions, I cannot describe the contents of the original LNCHARS_LN sectors. But no matter — we are going to change them anyway. I can show you my modified sectors (see Figs. 2 and 3).

Be sure that the first sector of BORDER1_LN is on the screen and type the new sector code in exactly as it appears in Fig. 2. If you make a mistake, it will show up as a slight graphic error but should still load.

After typing the sector in, rewrite the sector to disk. With Advanced Diagnostics, press FCTN 9 to go back to the command screen. Being sure that the sector number you are changing is shown correctly, change ES 34 to WR 34 (means write buffer to sector 34). Press enter and the new sector you typed in will replace the old sector 34. You have now finished half of the new border font.

Now load the second sector of the BORDER1_LN into your sector editor and type in the data as shown in Fig. 3.

You will notice that most of the numbers are in groups, separated by groups of zeroes. The character codes are in groups of 24 characters. At the start or end of every character is a group of zeroes. This is because the rectangles are 12 dots high and 8 dots wide. The border designs used are mostly 8x8, leaving a small section of unused space which shows up in the code as zeroes. The last group in the second sector is not changed, as this is the code for the "P" that shows the spaces reserved for the picture. A line is drawn through these so you can

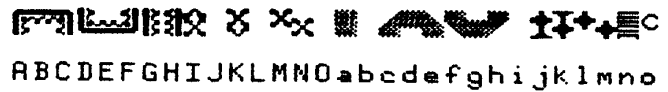


Fig. 1

easily see where they are located. You can put your own design in place of the "P" by changing this code, if you know what you are doing.

If you now have all of Fig. 3 typed in down to line 8 and fourth byte (fourth column from the left), save the sector to disk in the same way as you saved the first sector.

Now that you have changed the two sectors, the only thing left to do is to check your work. Do this by loading the Page Pro program, hit CTRL A to select load alternate character set, press No. 1 to select line font, and enter DSK1.BORDER1_LN. The file should load quickly, assuming you do not get an error code because of a mistake made while typing. Press CTRL 8 to see what you have. You should now have several new borders to use with Page Pro.

These new borders may take a little experimenting to use since they are based

(See Page 38)

Drive : 1 Track : 3
Side : 1 Sector : 34
Byte : 0 Display: Hex

```
003F7F606D6E646B68666668B00FF
FF00976666000000000000FCFE06
B67626161666666166B666668B664
6E6D607F3F000000000000666699
00FFFF0016666616162676B606FE
FC006B66666868666668B66666B8
1666661616666616166666161824
E7C3C3E724181824E7C300000000
0000000000000000C3E724181824
E7C3C3E724180000000000000000
00000000C3E724181824E7C30000
000000000000C3E724181824E7C3
000000000000000000000000AA55
AA55AA55AA55AA55AA5500000000
000000000000000000000102050A15
2A55AA55AA55AA55AA55AA55AA55
00000000B040A050AB54AA55AA55
AA55AA55AA55AA552A150A050201
00000000
```

Fig. 2

Drive : 1 Track : 3
Side : 1 Sector : 35
Byte : 0 Display: Hex

```
AA55AA55AA55AA55AA55AA55AA54
A850A04080000000000000000000
0000000018183CFFFF3C18181818
3CFFFF3C181818183CFFFF3C1818
18183CFFFF3C1818000000000000
000018183CFFFF3C1818FF00FF00
FF00FF00FF00FF81001C22404040
221C000000000000000000000000
00000000FFB7B7B7AFB7FFE3EBE3
EFFF000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
0000000000000000000000000000
00000000
```

Fig. 3

Spell-It

A faster, more flexible spelling checker for the TI

By JOHN KOLOEN

You have to wonder why it took so long for someone to come up with another spelling checker program for the TI. The first spelling checker for the TI, 99/4 Auto Spell-Check by Dragonslayer American Software Co., came out in the fall of 1984 (reviewed in the Sept. 1984 MICROpendium). That's more than five years until the second spelling checker made its debut, Spell-It by Jim Reiss.

The wait was worth it, but it would have been nice to have Spell-It several years ago.

As it is, Spell-It is a dramatic improvement over 99/4 Auto Spell-Check, in everything from speed of execution to ease of use. Anyone who has used both of these spelling checkers, I am certain, will opt to stay with Spell-It if the choice is offered.

In addition to being much faster in operation, Spell-It is designed to work with either a floppy or a hard disk system. Using 99/4 Auto Spell-Check with a hard disk often resulted in lockups. Spell-It also works with most RAMdisks, though, curiously, not with the Horizon RAMdisk, arguably the most popular RAMdisk for the TI. Spell-It can be purchased with a 25,000-word dictionary or a 250,000-word dictionary that requires a hard disk.

Briefly, the first version of Spell-It came out several months ago and is was numbered, appropriately, version 1.0. However, it wasn't long before Asgard began sending out revisions, numbered 1.05. The original version was a little buggy and wouldn't work with a hard disk despite claims to the contrary in the manual. Version 1.05, actually, consists of only four files used in configuring the program to the user's system. Asgard is confident that the V1.05 upgrade will work with virtually any floppy or hard disk systems.

I tested the program using both a Myarc floppy disk controller and a Myarc Hard & Floppy Disk Controller. I also ran it using CorComp and TI disk controllers and encountered no difficulties. I used it with a Geneve RAMdisk and it worked as

Review

Report Card

Performance.....	A
Ease of Use.....	A
Documentation.....	A
Value.....	A
Final Grade.....	A

Cost: \$24.95 for 3 SS/SD disks or \$19.95 for 1 DS/DD disk; HFDC version (11 disks with 250,000 word dictionary) \$34.95

Manufacturer: Asgard Software, P.O. Box 10306, Rockville, MD 20849; 703-255-3085.

Requirements: Memory expansion, floppy disk system, Extended BASIC, Editor/Assembler or TI-Writer. Hard disk, RAMdisk, Geneve 9640, optional.

advertised.

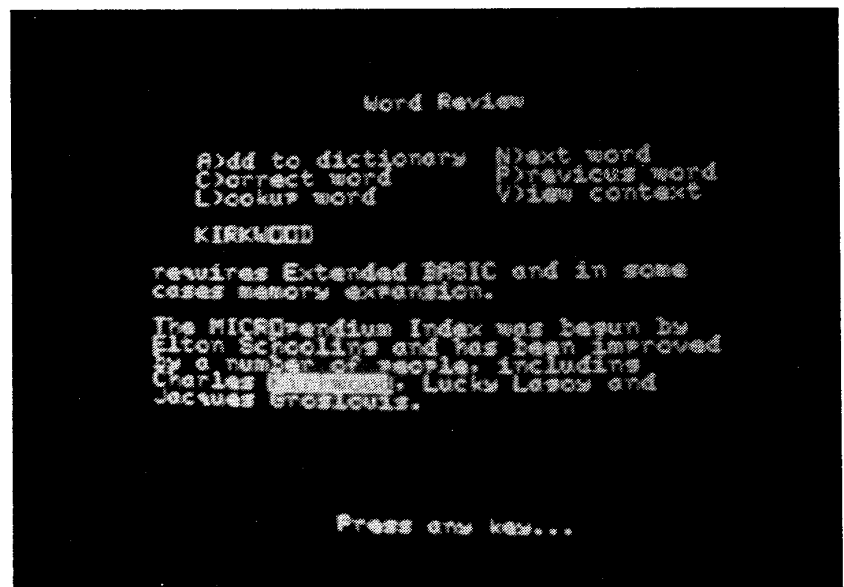
Performance: Spell-It is a spelling checker that is run on any D/V 80 file. It consists of some 25 files, most of them dictionaries. When you configure the pro-

gram, you tell it where the dictionary files are going to be located (using disk drive designations or subdirectory names) as well as designating a default for the location of text files to be checked. You also specify whether you want a 40- or 80-column screen. The configuration settings are then saved to disk and remain in effect until you decide to reset them.

Spell-It can be loaded through Extended BASIC, Editor/Assembler or through the Utility function of a word processor, such as TI-Writer or MY-Word. It can even be loaded from MDOS on the Geneve. Although I didn't try it, I'm sure it can be accessed through such shell programs as Funnelweb. To exit the program, you quit to the computer's title screen (in the case of the Geneve, you are returned to the GPL screen if you loaded it through GPL).

The recommended set up is to run the program from a hard disk if you have one, or a floppy. The text files you intend to check are best located in a RAMdisk to speed up I/O. After loading Spell-It, you entered the filename you want to check and Spell-It loads it into memory. It then

(See Page 31)



SPELL-IT—

(Continued from Page 30)

quickly scans the document and counts the number of unique words. It then compares these words to the those contained in its primary, common word dictionary. Subsequent to that, it compares the document to words in its other dictionaries — there are 18 of them in alphabetical order, though none is very large. When the document has been completely checked, the program reports the number of words it could not find in its dictionaries.

Then, an option screen appears that lets you perform the following functions:

- A)dd the word to the dictionaries
- C)orrect the word
- L)ookup the word in the dictionaries
- N)ext word
- P)revious word
- V)iew context

Each of these options is available as you go through the unique words. After acting on one, the next one appears until you've gone through all of them. This is similar in operation to 99/4 Auto Spell-Check, but the operation is much faster and practically seamless. The View context function is nicely done, pulling up four lines of text along with the word in question. The word is displayed in reverse video, which is easy on the eyes. This is an improvement from V1.0 which did not highlight the word in reverse video.

After finishing with the document, Spell-It writes the entire, corrected document back to disk using a different name than the original document. Spell-It appends the letter "S" to the end of the filename, so you'll need to restrict your filenames to nine or fewer characters. This is also a change between V1.0 and V1.05. In V1.0, Spell-It simply changed the existing text file and wrote it back to disk, which meant that you had to keep a copy of the original as a backup. Creating a second filename is a much better way of handling this chore. This way, if you have a power failure while the program is operating, you don't have to worry about losing the original file.

As with any spelling checker, this program won't help you if you don't know how to spell in the first place. Although it has a Lookup function that displays words

that come close to matching the word you are checking, there aren't many words in the dictionaries that come in the floppy disk version of Spell-It, and so very few words to be looked up. In fact, there are a lot of very common words that are not included in the dictionaries, though it is a simple matter to add them.

Adding words to the dictionaries can be done through the Add function of Spell-It or by loading the dictionaries into a word processor and inserting words, in alphabetical order, in the dictionaries them-

**Spell-It does its job very well,
and with none of the bugginess
that sometimes plagued
99/4 Auto Spell-Check.**

selves. Words included through the Add function are written to a dictionary called USER in the order that they were selected. For those who dream of huge dictionaries: The larger the dictionaries that Spell-It uses, the longer it takes to check a document. Even so, Asgard offers a 250,000-word dictionary for hard disk users.

Another drawback of spelling checkers is that you can't make corrections to words that are not spelling errors. Run-on words, for example, can't be corrected. So, if you typed "amoment," but mean "a moment," you'll have to wait until you load the document back into your word processor to correct it. Spell-It will display "amoment" as a word not in its dictionaries, but you can't enter a space as part of a word. Spaces are assumed to signal the end of a word. Other characters are also ignored by Spell-It. This is fairly common for spelling checkers on any computer. In fact, most spelling checkers ignore any character that does not belong in the alphabet, especially numbers. Spell-It does likewise.

How fast is it?

I checked a 58-sector long document, which was kept in a RAMdisk, while running Spell-It out of a hard disk with a 65-millisecond access time (rather slow for a hard disk) and it went through all its dictionaries in less than two minutes. (Spell-It checked this article in a little less than

75 seconds.) If you have the program running from a floppy, the speed would slow down a bit based on the slower access time of the floppy. Those who really want to speed things up can load Spell-It and its dictionaries into a RAMdisk.

The biggest limitation, in terms of document size, is the number of unique words in the document. The manual says Spell-It can handle upwards of 1,500 unique words in a single text file. I found the maximum to be about 1,200. The actual number may depend on such factors as the

lengths of the unique words. Even if you exceed the number of unique words Spell-It can handle, it won't crash. Rather, it will simply let you go through what it can handle and let you write the corrections back to disk. You can then load the document again

and finish the remaining unique words that didn't fit into memory.

Ease of Use: I found Spell-It to be very easy to use, both in terms of setting it up and actual execution. Most of its operations are very obvious. Asgard offers to provide support to those with special spell-checking needs, such as foreign languages, in creating large custom dictionaries using Asgard's proprietary utilities. Users would contact Asgard for the specifics and charges.

Documentation: The manual that comes with Spell-It is quite good. It outlines the various system configurations that are likely to be used and provides helpful hints about speeding up the operation of the program as well as how to get the most out of it, even if working out of a single-sided, single-density disk.

Final Grade: Spell-It does its job very well, and with none of the bugginess that sometimes plagued 99/4 Auto Spell-Check. I like the forthright way that Asgard came out with the upgrade, very quickly after the original was released. My only suggestions for improvement would be to allow some rudimentary editing function so that run-on words and similar typographical errors can be corrected through Spell-It. Since it already counts the unique words, why not a total for the total number of words? Otherwise, this is a fine program, at a fine price.

Interface Standard & Design Guide for TI99/4A Peripherals

A wealth of information for hardware hackers

By JAN JANOWSKI

When MICROpendium contacted me to review this manual, I thought, "Great, another hardware manual filled with hints and tips for hot rodding a TI Computer."

When I received it, I was a bit taken aback. I was so much expecting a manual full of modifications that, after reading a few pages, I couldn't help thinking "What, another Peripheral Expansion System Technical Manual?"

Folks, I now realize that my negative expectations were not to be fulfilled; however, I was not prepared for the wealth of information that is contained within this well-thought out and executed manual.

This manual — Interface Standard & Design Guide for TI99/4A Peripherals, by Tony Lewis — at first seems to be a repeat of the TI manual referred to in the previous paragraph, but delivers far more information than its predecessor. It contains far more information than the TI counterpart, going into far more detail to explain literally everything it covers. Some examples, you ask? Well for example:

Pages A2, B1, B3, and B4 go into great detail on every signal within the system, indicating whether the signal is input, out-

Review

Cost: \$21.95 w/1 DS disk; \$22.95 w/2 SS disks.

Manufacturer: Tony Lewis, 409 Drolmond Dr., Raleigh, NC 27615.

put, unique to the 4A or expansion system, and then describes the signal in detail.

Section E includes the types of memory mapping inside the TI, including (of all things) examples.

Sections on Hardware Design considerations, DSR (Device Service Routine) design considerations, suggestions, many pages of source code, DSR flowcharts, all with the idea of providing the technical know-how for the TI99/4A computer.

Being a hardware person, I was impressed with the clear, concise, manner that the hardware was explained, including examples detailing hardware interfacing.

As if that isn't good enough, the manual comes with a disk to assist in developing software and DSRs, and there are suggestions on other programs that would also be beneficial to the developer.

This manual is, without a doubt, becoming available at the wrong time. It should have come out 8-10 years ago! To this writer, this is the manual that Texas Instruments should have published to make hardware and DSR information available to third-party manufacturers. I can only imagine how this manual would have affected our community had its DSR information been made available when there were many more hardware developers making products for the 4A computer.

It is my sincere feeling that new hardware will keep our computer growing, and this manual will make the creation of new hardware easier to interface with the TI computer. This manual makes information on our computer easier to understand. No doubt the DSR assistance in print and on disk will assist software writers, too. If the software support is as good as the hardware support, we will see products because of this manual.

Janowski is a member of the Chicago TI Users Group and a hardware developer. One of his projects was the Portable TI, detailed in the June-August 1989 MICROpendium.—Ed.

UK fair goers see hardware demos

By STEPHEN SHAW

Held in one of the large sports halls of the Chester Northgate Arena, the annual meet of the TI99/4A Users Group (U.K.) again confirmed the strong support of this computer in the United Kingdom by a small handful of users. The May meet was visited by 50-odd members of the 140-170 who are scattered over the UK and abroad.

Unfortunately we were not able to see the Asgard mouse, nor the long-awaited extensions to Turbo Pasc 99, but on show were the Mechatronic mouse and 80-column peripheral, also a TI99/4A console connected to a Tatung Einstein Monitor. The now discontinued Tatung Einstein, like the European version of the TI, had a colour-difference signal output, and the monitor can be merely plugged into the TI console. The PAL TI99/4A does not have a colour composite video signal output nor an RGB output and cannot readily be connected to "normal" monitors!

The Geneva was represented and also on show was a demo of two TI consoles linked via RS232 to demo the various telecommunications packages, from Telco down to TE2.

The commercial support came from Martin Blythe, trading as DATABASE, from Bronfa, Llanbydder, Dyfed, SA40 9UB. Martin has taken over UK module stocks from Frances Parrish, and had a number of special offers for the show. Martin has a good stock of some modules,

and some of our U.S. friends (including TI commercial supporters and users groups) may be interested in purchasing some of his titles in bulk.

One display item was a photograph of young George Shaw (present with his favorite teddy bear Matthew) measuring 2x2 inches, and two printouts produced on a TI99/4A, based on the photo, one measuring 7/8x5/8 inches and the other 8x8 inches. These represented a beta test of a possible new service for TI owners which may be offered by a famous U.S.-based owner (who at present wishes anonymity). The photo was scanned on a PC compatible, and cleaned up using Paintbrush (in particular, the background was removed). Then the PC picture was translated to MacPaint format and transferred to the TI via RS232. From here, it could be printed with MacFlix or PixPro, and, in fact, was translated from MacPaint format to TI-Artist format using PixPro. The TI-Artist picture was then printed as the 8x8-inch picture using SmArtpic by Alexander Hulpke. The smaller picture was made by using Squeezer to reduce the TI-Artist picture to quarter size. Then the small TI-Artist pic was printed using Artist Photographic V.2, supplied with Harry Brashear's Home Publishing on the 99/4A, Supplement 3. While TI programs could reproduce the scanned photo in the correct aspect ratios, the PC could not — the two computers used together produced a result better than either could do on its own!

Newsbytes

Chicago Faire set for November

The Eighth Annual Chicago TI International World Faire is scheduled for Nov. 3 at the Holiday Inn, 3505 Algonquin Rd., Rolling Meadows, Illinois, sponsored by the Chicago Area TI99/4A Users Group.

Faire hours will be 9 a.m.-6 p.m., with a \$4 admission fee.

A social mixer will be held from 8 p.m. to midnight Nov. 3, at a \$5 fee, and a dinner will be held from 6 to 9 p.m. after the Faire, with a cost of \$15 each.

Exhibit space is available at \$75 per eight-foot table. Hotel rooms are \$54 each, for single, double or tower rooms and van service to the hotel is free to and from the O'Hare Airport.

For further information, contact Hal Shanafield, Faire Manager, c/o Chicago Area TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657, or call (708) 864-8644 (2-10 p.m.); hot line answering machine, (708) 869-4304; or BBS (708) 862-0182 (leave message to #162).

The Chicago Faire is held in conjunction with the Milwaukee TI-Faire, which is scheduled 9 a.m.-5 p.m. at the Quality Inn, 5311 South Howell Ave., Milwaukee, Wisconsin (across from Mitchell Field Airport).

For information on the Milwaukee Faire, contact the Milwaukee Area 99/4A Users Group, Gene Hitz, 4122 North Glenway, Wauwatosa, WI 53222, or (414) 535-0133.

TI-Base version number is 3.01

An item in the June 1990 Comments column referred to "the 3.1 upgrades to Inscobot's TI-Base."

According to Steve Lamberti of Texaments, the correct version number is 3.01.

VAST runs BBS

The Valley of the Sun TI Users Group runs the only TI BBS operating in the Phoenix, Arizona, area, according to Tom Pfeffer, publicity chairman for the group.

New phone number for the 24-hour board is (602) 433-2767. It supports 300, 1200 and 2400 baud and is using PC Board

for uploads, downloads and messages. Leo Baker is the sysop.

Fest West 91 slated

Fest West 91 is scheduled for Feb. 16-17 at the Ramada Main Gate in Anaheim, California, across the street from Disneyland.

Host for the fair is the Users Group of Orange County, in association with the Pomona Valley Users Group.

Toll free number for the Ramada Main Gate is 1-800-447-4048. The hotel has 50 rooms for fest goers at \$55 per night. Travel arrangements may be made through Ruth Dickey at Travel Concepts, (714) 778-5459.

For further information, write Fest West 91 Committee, c/o Bill Nelson, 11692 Puryear Lane, 92640, or call the UGOC BBS at (714) 778-5459.

Columbia Northwest Fair plans awards

Organizers of the Columbia Northwest TI99/4A Fair, scheduled for Oct. 27-28 in Portland, Oregon, plan to award prizes for "best new software" and "best new hardware" introduced to the TI community at the Saturday evening banquet held in conjunction with the fair.

Separate categories for "fairware" and commercial products will be recognized.

For further information, write Columbia Northwest TI99/4A Fair, 100 East 19th St., Ste. 300, Vancouver, WA 98663-3379; or call (206) 693-7575, or (503) 636-1839 (voice); or (206) 687-4497, or (503) 233-6804 (BBS).

Lima Fair tapes show presentations

Videotapes showing all the formal presentations at the May 26 TI Multi User Group Conference at Lima, Ohio, are available to any user group or to any individual who is a paid member of the Lima Ohio User Group, according to Charles Good, newsletter editor and librarian for the group.

The set of three VHS tapes includes approximately 16 hours of viewing, showing both the speakers and direct computer video and audio output of demonstrated

software. The videos may be obtained by sending three VHS tapes and \$3 postage; or by sending \$15 for tapes and postage to Lima Ohio User Group, P.O. Box 647, Venedocia, OH 45894.

Topics and speakers include:

Gary Bowser, Rambo, Review Module Library box; Jim Horn, giving spare computers to schools; Bruce Harrison, assembly language programming of music on the 99/4A; users group officers meeting; Bud Mills, Memex, P-Gram and Horizon RAMdisks; Gary Taylor, demonstration of TI's Compact Computer 40, TI's Hex Bus peripherals and a Mechatronics Hex Bus drive; Chris Bobbitt, Midi interface, Asgard mouse, Rock Runner game, Spell-It! and other Asgard software and comments on Press.

Also, Barry Traver, Genial TRAVELER and a beginner's tutorial on how to add assembly CALL LINKs to Extended BASIC programs; Jim Peterson, Don Shorock's Kana Filer that speaks and writes Japanese (with TEII) and drills vocabulary; Charles Good, Don Shorock's Airtaxi, an individually customized geography game, and the new features of Funnelweb V4.30; Paul Scheidemantle, graphic utilities for use with Page Pro VI.6 and creating a one-page ad; Beery Miller, future software for the Geneve to be published in 9640 News; and WLIO TV35 coverage of the conference on the evening news.

Also, Karl Romstedt, friendly general LOADER and label printing software in Extended BASIC with assembly subroutines; Harold Hoyt, applications of Steve Karasek's Super BASIC; Irwin Hott, using ALSAVE to imbed assembly code within an XB program; Bill Hudson, an assembly language prescan for XB; and a Multiplan tutorial by the Great Lakes Computer Group.

Newsbytes is a column of general information that reaches thousands of TI and Geneve users. Information from manufacturers, authors, distributors, user groups, etc. is welcome. Illustrations will be used when space permits. Products listed in this column are not necessarily endorsed by MICROpendium. Send items to MICROpendium Newsbytes, P.O. Box 1343, Round Rock, TX 78680.

User Notes

Three column output

The following program, by Michael Ritweger, of Kiel, West Germany, can be used for several purposes. What it does is output D/V80 files in three columns on a page in small type. Each column is 40 characters across. An Extended BASIC program saved as a DV/80 file will be printed in in three columns. Similarly, any DV/80 column can also be output in three columns. The printer codes are for use with Epson-compatible printers. The program requires a memory expansion, Extended BASIC and a printer.

The author wrote the program to print sourcecodes. It is called "LISTSMALL." The features of this program are:

- Takes the first 40 characters of each line and cut off the rest of it (if there is anything).
- Sets the linefeed to 1/8 inch to print a maximum of 88 lines per column.
- Sets the pitch to 17 cpi to allow printing in three columns with 40 characters each.
- Gives the option of printing a header and page numbers. If both options are chosen, there are 80 lines per column left.
- Gives the options to remove REMs (indicated by an asterisk) and blank lines.

The program should work on all printers. The codes used in it are explained in REMs at the beginning of the program.

```
10 ! CONTROL-CODES USED: !23
4
20 ! 27 - 28 :
    SET LINEFEED TO 1/8 INCH
    !098
30 ! 15 :
    SET PITCH TO 17 CPI !238
40 ! 10 :
    EXECUTE LINEFEED !141
50 ! 12 :
    EXECUTE FORMFEED !155
60 ! 13 :
    EXECUTE CARRIAGE RETURN !
146
100 CALL CLEAR !209
110 OPTION BASE 1 !137
120 DIM A$(264)!195
130 INPUT "FILE: DSK1.":DS !
060
140 ON ERROR 130 !139
150 OPEN #1:"DSK1."&DS,INPUT
```

```
,DISPLAY ,VARIABLE 80 !234
160 PRINT !156
170 INPUT "DELETE BLANK LINE
S? ":YNS !034
180 FL1=0 :: IF YNS="Y" THEN
    FL1=1 ELSE IF YNS<>"N" THEN
        170 !221
190 PRINT !156
200 INPUT "DELETE REMARKS? "
:YNS !048
210 FL2=0 :: IF YNS="Y" THEN
    FL2=1 ELSE IF YNS<>"N" THEN
        200 !253
220 PRINT !156
230 INPUT "HEADER? ":YNS !23
3
240 FL3=0 :: IF YNS="N" THEN
    260 ELSE IF YNS<>"Y" THEN 2
30 !110
250 FL3=1 :: LINPUT "":HEAD$
:: HEAD$=SEG$(HEAD$,1,126):
: HEAD$=RPT$(" ",INT((126-LE
N(HEAD$))/2))&HEAD$ !099
260 PRINT !156
270 INPUT "PAGE-NUMBERS? ":Y
NS !172
280 FL4=0 :: IF YNS="Y" THEN
    FL4=1 ELSE IF YNS<>"N" THEN
        270 !072
290 ON ERROR 660 !159
300 OPEN #2:"PIO.CR.LF",OUTP
UT,DISPLAY ,VARIABLE 132 !14
1
310 PRINT #2:CHR$(15);CHR$(2
7)&CHR$(48)!023
320 FOR A=1 TO 264+((FL3=1)*
12)+((FL4=1)*12)!174
330 IF EOF(1)THEN 400 !191
340 LINPUT #1:AS(A)!105
350 IF FL1=0 THEN 370 !234
360 IF AS(A)=" " THEN 330 !0
01
370 IF FL2=0 THEN 390 !255
380 IF SEG$(AS(A),1,1)="*" T
HEN 330 !170
390 GOTO 410 !234
400 AS(A)=" " !152
410 AS(A)=SEG$(AS(A),1,40)!1
83
420 NEXT A !215
430 IF FL3=0 THEN 480 !090
440 PRINT #2:" " &HEAD$;C
HR$(13);CHR$(10)!234
450 PRINT #2:CHR$(10)!183
460 PRINT #2:" " &RPT$("-
```

```
",126);CHR$(13);CHR$(10)!014
470 PRINT #2:CHR$(10)!183
480 A1=88+((FL3=1)*4)+((FL4=
1)*4)!027
490 FOR A=1 TO 87+((FL3=1)*4
)+((FL4=1)*4)!032
500 PS=AS(A)&RPT$(" ",40-LEN
(AS(A)))&" ! " &AS(A+A1)&RPT$
(" ",40-LEN(AS(A+A1)))&" ! "
&AS(A+A1*2)!196
510 PRINT #2:" " &PS;CHR$
(13);CHR$(10)!040
520 NEXT A !215
530 A1=88+((FL3=1)*4)+((FL4=
1)*4)!027
540 PS=AS(A1)&RPT$(" ",40-LE
N(AS(A1)))&" ! " &AS(A1*2)&RP
T$(" ",40-LEN(AS(A1*2)))&" !
" &AS(A1*3)!157
550 PRINT #2:" " &PS;CHR$
(13)!006
560 IF FL4=0 THEN 620 !232
570 PRINT #2:CHR$(10);CHR$(1
0)!217
580 PRINT #2:" " &RPT$("-
",126);CHR$(13);CHR$(10)!014
590 PRINT #2:CHR$(10)!183
600 PAGE=PAGE+1 !179
610 PRINT #2:" " &RPT$("
",60)&"- " &RPT$("0",2-LEN(ST
R$(PAGE)))&STR$(PAGE)&" -";C
HR$(13)!121
620 PRINT #2:CHR$(12)!185
630 IF EOF(1)THEN 640 ELSE 3
20 !059
640 CLOSE #1 !151
650 CLOSE #2 !152
660 END !139
```

SCCG correction

Lutz Winkler of the Southern California Computer Group writes to correct the entry for the group in Gerald MacDonnell's BBS listings (May 1990). The SCCG 99BBS is (619) 278-8155, 300-2400 baud (8N1), running on a TI99/4A 24 hours a day.

Card catalog for disk users

This program, originally by Ed York, has appeared in a number of user group

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User Notes

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newsletters. The program prints out listings of disks in a 3 x 5 format. Those with pin-feed card forms can simply print out the disk listings and store the cards for reference. Others may print out the listings to paper, cut them out and paste or tape them to standard 3 x 5 cards.

The program is designed for use with Epson-compatible printers. Users with other brands may need to modify the printer codes.

```

100 ! *****
!063
110 ! * 3 X 5 CARD CATALOG *
!140
120 ! *****
!063
130 ! Original: Ed York
    Revamped: Rick Kellogg
    Revision: Ed York !211
140 !!131
150 DIM A$(12):: FOR A=1 TO
12 :: READ A$(A):: NEXT A ::
    CALL CLEAR !070
160 DATA JAN,FEB,MAR,APR,MAY
,JUN,JUL,AUG,SEP,OCT,NOV,DEC
!090
170 DISPLAY AT(9,9):"DISK LA
BELER": "      ENTER TODAY'S
DATE": :TAB(11);"MM/DD/YY":
: :TAB(11);"___/___/9 " !112
180 ACCEPT AT(16,11)BEEP:SIZE(-2)
VALIDATE(DIGIT):BS:: IF
F BS="_" THEN 180 ELSE IF (
VAL(BS)>12)+(VAL(BS)<1)THEN
170 !036
190 ACCEPT AT(16,14)SIZE(-2)
VALIDATE(DIGIT):BEEP:CS:: IF
CS=" " THEN 190 ELSE IF (V
AL(CS)>31)+(VAL(CS)<1)THEN 1
90 !204
200 ACCEPT AT(16,18)SIZE(-1)
VALIDATE(DIGIT):BEEP:DS:: DS
="B"&DS:: GOSUB 610 !147
210 ES=A$(VAL(BS))&" "&CS&"
19"&DS:: FS(1)="D/F":: FS
(2)="D/V":: FS(3)="I/F"::
FS(4)="I/V":: FS(5)="PROGRM
" !247
220 IMAGE "DISKNAME: #####
### FREE:#### USED:####"
!024
230 IMAGE "##### SIDED/####
## DENSITY #####" !

```

```

*****
DISKNAME: TEST          FREE: 240    USED: 118
SINGLE SIDED/SINGLE DENSITY *****
*****

```

Filename	Size	Type	P	Filename	Size	Type	P	Filename	Size	Type	P
CARDCAT	15	PROGRM		CARDCAT2	12	PROGRM		MCKECHNIE	41	D/V	80
TANK	50	I/V254									

```

049
240 IMAGE "##### #### #
##### #          #####
# ##### #          #####
#### ##### #" !061
250 IMAGE "##### #### #
##### #          #####
# ##### #" !255
260 IMAGE "##### #### #
##### #" !193
270 OPEN #1:"PIO",VARIABLE 1
00 :: PRINT #1:CHR$(15);CHR$(
27);"S";CHR$(0);CHR$(27);"A
";CHR$(5)!001
280 OPEN #2:"DSK"&STR$(B)&"
",INPUT,RELATIVE,INTERNAL :
: INPUT #2:G$,C,C,D !139
290 PRINT #1:RPT$("=" ,86);CH
R$(27);"A";CHR$(3):: E=0 !22
2
300 PRINT #1:CHR$(27);"W";CH
R$(1):: PRINT #1,USING 220:G
$,D,C-D !239
310 IF C>720 AND C<1441 THEN
H$="DOUBLE" :: I$="DOUBLE"
!213
320 IF C>360 AND C<721 THEN
H$="SINGLE" :: I$="DOUBLE" !
171
330 IF C<361 THEN H$="SINGLE
" :: I$="SINGLE" !144
340 PRINT #1:CHR$(14):: PRIN
T #1,USING 230:H$,I$,E$ :: P
RINT #1:CHR$(27);"W";CHR$(0)
!126
350 PRINT #1:RPT$("=" ,86);CH
R$(27);"A";CHR$(5)!099
360 PRINT #1,USING 240:" Fil
ename ","Size"," Type ","P",
" Filename ","Size"," Type "
,"P"," Filename ","Size"," T
ype ","P" !111
370 PRINT #1,USING 240:"----
-----","-----","-----
","-----","-----","-----
","-----","-----","-----
","-----","-----","-----
","-----","-----","-----
" !248
380 IF E=126 THEN 620 !210
390 FOR F=1 TO 3 :: INPUT #2
:J$(F),G(F),H(F),I(F):: NEXT

```

```

F :: IF LEN(J$(1))=0 THEN 4
40 ELSE IF LEN(J$(2))=0 THEN
GOSUB 490 ELSE 410 !043
400 PRINT #1,USING 260:J$(1)
,H(1),K$(1),L$(1):: E=E+1 ::
GOTO 380 !211
410 IF LEN(J$(3))=0 THEN GOS
UB 490 :: GOSUB 520 :: PRINT
#1,USING 250:J$(1),H(1),K$(
1),L$(1),J$(2),H(2),K$(2),L$(
2):: E=E+2 :: GOTO 380 !103
420 GOSUB 490 :: GOSUB 530 :
: GOSUB 570 !047
430 PRINT #1,USING 240:J$(1)
,H(1),K$(1),L$(1),J$(2),H(2)
,K$(2),L$(2),J$(3),H(3),K$(3
),L$(3):: E=E+3 :: GOTO 380
!198
440 PRINT #1: : PRINT #1:CH
R$(18);CHR$(27);CHR$(50):: C
LOSE #2 :: CLOSE #1 :: DISPL
AY AT(20,1):"Want another Co
py or Disk? Y": :"" !248
450 ACCEPT AT(20,28)SIZE(-1)
VALIDATE("YN")BEEP:M$ :: IF
M$="Y" THEN GOSUB 610 :: GOT
O 470 ELSE CALL CLEAR !203
460 OPEN #1:"PIO" :: PRINT #
1:CHR$(27);"T" :: CLOSE #1 :
: STOP !064
470 DISPLAY AT(20,1)BEEP:"
INSERT DISK INTO DRIVE "&STR
$(B): : " PRESS ANY KEY TO
BEGIN " !004
480 CALL KEY(0,J,K):: IF K<1
THEN 480 ELSE 270 !111
490 IF G(1)>0 THEN L$(1)=" "
ELSE L$(1)="Y" !079
500 IF ABS(G(1))=5 THEN K$(1
)=F$(5):: RETURN ELSE A=LEN(
STR$(I(1)))!003
510 IF A=1 THEN K$(1)=F$(ABS
(G(1)))&" "&STR$(I(1)):: RE
TURN !249
520 IF A=2 THEN K$(1)=F$(ABS
(G(1)))&" "&STR$(I(1)):: RET
URN ELSE K$(1)=F$(ABS(G(1)))
&STR$(I(1)):: RETURN !101
530 IF G(2)>0 THEN L$(2)=" "

```

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User Notes

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```

ELSE L$(2)="Y" !082
540 IF ABS(G(2))=5 THEN K$(2)
=F$(5):: RETURN ELSE A=LEN(
STR$(I(2)))!006
550 IF A=1 THEN K$(2)=F$(ABS
(G(2)))&" "&STR$(I(2)):: RE
TURN !252
560 IF A=2 THEN K$(2)=F$(ABS
(G(2)))&" "&STR$(I(2)):: RET
URN ELSE IF A=3 THEN K$(2)=F
$(ABS(G(2)))&STR$(I(2)):: RE
TURN !154
570 IF G(3)>0 THEN L$(3)=" "
ELSE L$(3)="Y" !085
580 IF ABS(G(3))=5 THEN K$(3)
=F$(5):: RETURN ELSE A=LEN(
STR$(I(3)))!009
590 IF A=1 THEN K$(3)=F$(ABS
(G(3)))&" "&STR$(I(3)):: RE
TURN !255
600 IF A=2 THEN K$(3)=F$(ABS
(G(3)))&" "&STR$(I(3)):: RET
URN ELSE IF A=3 THEN K$(3)=F
$(ABS(G(3)))&STR$(I(3)):: RE
TURN !160
610 DISPLAY AT(24,7):"CATALO
G DRIVE: 1" :: ACCEPT AT(24
,23)BEEP SIZE(-1)VALIDATE("1
234"):B :: RETURN !071
620 INPUT #2:J$(1),G(1),H(1)
,I(1):: GOSUB 490 :: PRINT #
1,USING 250:J$(1),H(1),K$(1)
,L$(1):: GOTO 440 !248
630 END !139

```

TI-Base command file utility

This comes from Bill Gaskill, of Grand Junction, Colorado. Gaskill writes a monthly column on using TI-Base. He writes:

One of the neatest features found in TI-Base V3.0 is the ability to program inverse video into your command files. While you can "inverse" everything that is displayed on a screen with the SET INVERSE ON directive, there are many times when you would probably want to only have certain portions of the screen displayed as inverse video. An example might be to highlight the length of an input field. This can be done by adding the number 128 to the ASCII code for the character(s) to be

inversed, and then holding down the Ctrl key and typing in the resultant value. For example, you would type in Ctrl 160 to highlight a blank space (32+128=160). Since the ASCII value for a blank space is 32, you would add 128 to it to arrive at 160. If you had a 10 character input field, Ctrl 160 would be keyed in 10 times in the TI-Base command file editor, in the WRITE statement for the line that was to display the input prompt.

The purpose for the Extended Basic program below is to allow command files created in TI-Base to be joined so that features such as selective inverse video can be programmed into a larger file and then be saved. Currently, a command file created in TI-Base's resident command file editor can only be about 50 lines long, even though the TI-Base program itself can read and interpret command file of virtually any length. While 50 lines may be adequate for many purposes, it does not allow enough space for really sophisticated applications like custom input screens and menus. Since you MUST use the resident command file editor to create selective inverse video, larger command files with selective inverse video simply cannot be created.

When TI-Base began supporting D/V80 command files in V1.1 I began using TI-Writer to create them. This allowed me to create files as large as I wanted without fear of getting that dreaded "can't get dynamic memory" error message. But files using selective inverse video control characters can't be created nor loaded into TI-Writer (it locks the program up), so I decided that the solution was to create the files in segments in the TI-Base command file editor and then merge them into one large file.

The MERGETIB program listed below does just that, and it retains the selective inverse video control characters in the process. It is set up to merge two command files of any size into a single command file that is automatically saved in the /C format that TI-Base requires. When you start the program it prompts you for the path and name of the first half of your command file and then the path and name of the second half. Finally, you enter the path and name of the file that will be saved for use in TI-

Base. You DO NOT have to add a /C to any of the file names entered. The program does that for you.

You may specify any path, including WDS1 for hard drives and you may also build in directory names. The only limit is the 28 character limitation of the ACCEPT AT statement in Extended Basic. When you are done the resultant command file may be activated in TI-Base with the normal DO FILENAME command, and your inverse video will appear as planned.

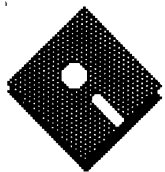
Although MERGETIB only accepts two files at a time, you can of course merge as many segments as desired. If you had a four segment command file you would simply merge segments 1 and 2 and save them as say segment A. Then you would merge segments 3 and 4, saving them as say segment B. Finally, you would merge segments A and B and save them as the final command file name that you wished to use in TI-Base.

```

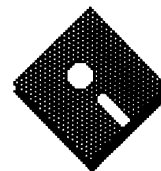
1 !TI-Base command file
merge utility
05/12/90 !058
2 !Bill Gaskill
Box 2642
Grand Junction, Colo.
81502 !193
100 CALL SCREEN(4):: FOR I=0
TO 14 :: CALL COLOR(I,2,3):
: NEXT I :: CALL CHAR(126,"0
OFF"):: ON ERROR 360 !154
110 DISPLAY AT(2,1)ERASE ALL
:" Command File Merge Utilit
y":RPT$(" ",28):: CALL KEY(3
,K,S)!044
120 DISPLAY AT(4,1):"Enter t
he name of the first command
file segment:": "DSK1.FILE
1" !237
130 DISPLAY AT(9,1):"Enter t
he name of the secondcommand
file segment:": "DSK1.FILE
2" !039
140 DISPLAY AT(14,1):"Enter
the name of the merge file t
o save them as:": "DSK1.FIL
E" !087
150 DISPLAY AT(19,1):"Correc
t? (Y/N):" :: DISPLAY AT(24,
1):"DO NOT ADD ""/C"" TO FIL
ENAME." !168

```

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User Notes

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```

160 ACCEPT AT(7,1)BEEP SIZE(
-28):IN1$ :: IN1$=IN1$&"/C"
!150
170 ACCEPT AT(12,1)BEEP SIZE
(-28):IN2$ :: IN2$=IN2$&"/C"
!198
180 ACCEPT AT(17,1)BEEP SIZE
(-28):ON$ :: ON$=ON$&"/C" !0
71
190 ACCEPT AT(19,16)BEEP SIZ
E(1)VALIDATE("YN"):YN$ :: IF
YN$<>"Y" THEN 120 !022
200 IF IN1$=ON$ THEN 350 !19
9
210 IF IN2$=ON$ THEN 350 !20
0
220 OPEN #1:ON$,UPDATE,DISPL
AY ,VARIABLE :: OPEN #2:IN1$
,INPUT ,DISPLAY ,VARIABLE ::
DISPLAY AT(21,1):"Reading f
rom:":IN1$ !249
230 LINPUT #2:AS :: DISPLAY
AT(19,1):AS :: PRINT #1:AS :
: Y=Y+1 :: DISPLAY AT(24,1):
"Lines saved:":Y !111
240 IF EOF(2)THEN CLOSE #2 E
LSE 230 !046
250 OPEN #3:IN2$,INPUT ,DISP
LAY ,VARIABLE :: DISPLAY AT(
21,1)BEEP:"Merging from:":IN
2$ !197
260 LINPUT #3:AS :: DISPLAY
AT(19,1):AS :: PRINT #1:AS :
: Y=Y+1 :: DISPLAY AT(24,1):
"Lines saved:":Y !112
270 IF EOF(3)THEN CLOSE #3 E
LSE 260 !079
280 CLOSE #1 :: CALL HCHAR(2
0,1,32,160)!038
290 DISPLAY AT(23,1):"Print
Merged Command File?" :: ACC
EPT AT(23,27)SIZE(1)VALIDATE
("YN"):YN$ !245
300 IF YN$<>"Y" THEN END ELS
E DISPLAY AT(23,1):"Printer:
" !040
310 ACCEPT AT(23,9):PR$ :: O
PEN #1:ON$,INPUT ,DISPLAY ,V
ARIABLE :: OPEN #2:PR$,OUTPU
T !108
320 LINPUT #1:B$ :: IF EOF(1
)THEN 340 !193
330 PRINT #2:B$ :: GOTO 320
!193

```

```

340 DISPLAY AT(23,1):"Printi
ng Completed..." :: CLOSE #1
:: CLOSE #2 :: END !062350
DISPLAY AT(21,1):"Output fil
e can't have same name and d
rive as input file" :: GOTO
120 !240
360 RUN !169

```

User Notes is a column of tips designed to help readers use their computers better. The information provided comes from many sources, including user group newsletters and MICROpendium readers. MICROpendium pays \$10 for items sent in by readers that appear here. Mail to P.O. Box 1343, Round Rock, TX 78680.

BORDER FONT—

(Continued from Page 29)

on an 8x8 design. Remember, the rectangle they fit into is 12 high x 8 wide. Some of the patterns for the sides have the design and then a restart of the design, since they have to match up on the sides. You must use the right ones to end up with a continuous pattern. The corners are uppercase keys A, C, D, F and lowercase c, e, f, h. Two of the borders do not use special codes for the corners.

I will mention here that the ASCII codes used are the same as those shown in the Extended BASIC manual (Chap. 4, Page 57, and Page 198) using codes 0-9 and A-F. The small font is set up just like the line font, except it is much longer. It starts

with the ASCII code 32 (space) and continues through all the displayable characters and with no special designations, as with TI-Artist D/V80 files. The larger font is also like the other two, except it uses four of the rectangles put together, with two on top and two on the bottom. The order that the code is entered is: Left top, right top, left bottom, right bottom. The codes are put in the same order as the other character codes, from top to bottom, alternating between left, then right code.

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