# MICAOpendium

Volume 6 Number 3

**April 1989** 

\$2.00

# HELP

An Extended BASIC program to create reminder screens

# **XDIR**

An extended utility for MDOS users

# TICK TOCK

An XBASIC program to keep track of elapsed time

#### REVIEWS

- ☐ Checkbook Manager III
- ☐ TI-Runner Level Editor
- ☐ TI-Writer V4.01, Artist Borders I-III, Multiplan Printer Codes

#### INSIDE

- ☐ Knitting patterns from your TI
- ☐ Part II of Modular Programming with the Editor/Assembler
- ☐ Complex arithmetic functions in c99

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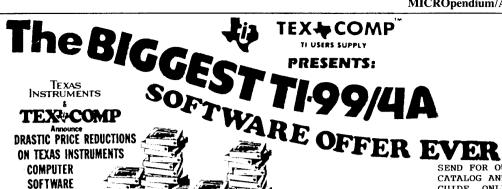
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#### Extended BASIC

#### c99

## Loaders, modular programs, linkages, overlays

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#### Geneve 9640

#### Reviews

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#### **Newsbytes**

#### **User Notes**

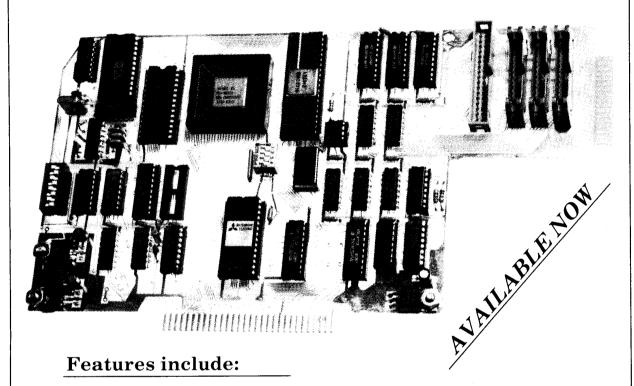
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#### **Programming conventions**

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 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.

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# Comments

# Lots of little things to catch up on

Let's see, what's going on:

I've seen mention of a new chess program for the TI based on the popular Sargon chess program in the PC and Apple worlds. As soon as I can get a copy, I'll report on it. First thing I'd like to do is to have it play against the TI Chess module. I encourage anyone who has seen this program to drop us a line.

#### PROGRAMS ON DISK

We are going to start providing disks of the programs that appear in MICROpendium. The cost will be \$4 per issue and include media, mailer and postage and will be on DSSD disks, unless the user specifies SSSD. This is something we've resisted in the past because of the time it takes to handle it and the difficulty in estimating costs. (Anyone want to buy a TI-Forth manual? We printed 400 of them several years ago, sold 300 and have been sitting on the last 100 since. They cost us \$14 apiece. I misjudged the demand for them.) But with the Myarc hard disk controller we think we can get well-enough organized to make this "disk thing" work.

There are a number of reasons to provide this service, one of which is to help those who have difficulty typing or have vision problems. At this point, we will make the disks available only for 1989 and later editions. If there is enough demand, we may be able to pull something together from previous years, and we may be able to reduce the cost.

I don't think this will create any problems as far as copyrights are concerned because the programs will be provided only to subscribers who already have access to the programs. All programs will be exactly as they appear in MICROpendium, which are exactly as we receive them from the authors.

Readers may pay \$40 in advance to receive 12 monthly disks. Annual subscriptions allow us to buy disks and mailers at greater volumes and at lower rates, hence the \$8 savings. (I've got my fingers crossed on this, not wanting to end up with a roomful of unused disks and mailers to go along with my box of Forth manuals.) Readers who want to order disks may send checks, money orders or credit card information (Visa or MasterCard, card number and expiration date), and the issue(s) you want to receive.

The price covers postage for the United States and Mexico. For Canada, add 9 cents per disk postage (\$1.08 per year); for other countries, add 35 cents per disk surface mail. Air mail additions are 78 cents per disk in Columbia, Venezuela, Central America and the Caribbean; \$1.16 per disk in the rest of South America and Europe; and \$1.53 per disk in Africa, Asia, Australia and New Zealand.

#### LISTINGS SHOULD BE MORE READABLE

Most of the programs in this issue were outputted using

a 24-pin dot matrix printer. They should be consistently legible, although we won't know for sure until we get them back from the press.

#### POSTAL PROBLEMS SHOULD BE OVER

I think we've solved the recent late delivery problems that we've had in some regions of the U.S. It's taken 18 months, but it turns out, apparently, that the people who put the magazines in the mail sacks have been placing labels meant for third-class mail on the second-class sacks. Thus, instead of going to the second-class center in Houston, these sacks were shipped to the third-class center in Dallas. It didn't come to anyone's attention until recently.

#### PROGRAM UPDATES

A hard-disk version of MDOS has appeared on bulletin boards in mid-April. It's not a finished product, so anyone who uses it is essentially doing beta testing. This version is incompatible with the Myarc Disk Manager V. Progess is also being made on Myarc Advanced BASIC. New CALLs include CALL MYART to load a MY-Art picture file, and INVERT and BLINK for use with DISPLAY AT. It's still not ready for distribution, however.

Barry Boone has produced another version of his Archiver III program. This version is number 3.03. Changes from Version 3.0 include screen color changes when functions are finished executing, the ability to quit the program using FCTN QUIT, the ability to list text files to a printer and the ability to designate any floppy or RAMdisk in the range of 1-Z. It also seems to load faster. He is working on a version that provides full support for a hard disk.

#### CREDIT WHERE IT IS DUE

Now we know who wrote last month's batch file for the Geneve. It was Charles A. Nicholas. He writes:

I wrote the file to "help" myself with the MDOS syntax which is similar but not exactly the same as MS-DOS on the PC. I am primarily a UNIX user and miss the on-line manual feature on the other non-UNIX systems I use at work (Macintosh and MS-DOS) and MDOS. The help file came about after wasting time looking up stuff like r/w protection and mode commands and volume labels, and so on. The batch file seemed like a good way to get around this. The successive IF statements were necessary since early versions of MDOS couldn't transfer control to other locations in the file. The "program" evaluates the string to test for the keyword string and performs the ECHO on a match. The IF tests following the successful ECHO are necessary since MDOS just transfers control to the line following it in the file. These tests prevent any additional ECHOes.

# MICROdex

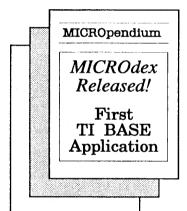
#### Your Window to Information

MICROdex is a fast, easy to use, publication indexing system that places an enormous amount of information at your fingertips. Frantically searching through all your magazines for a particular article, program, or review, is a thing of the past. MICROdex can even help you better understand the powers of TI Base.

With MICROdex, you can locate the source of various information printed about the TI-99/4a, and in some cases, the Geneve 9640. Any article, program, review, or editorial, that has appeared in many TI-related publications can be quickly located by subject, source, or type. Printed reports can also be prepared based on different search criteria, including a comprehensive listing of all references. On-line help is even available.

# Written in TI Base for TI Base

Although MICROdex is a complete database application, it can also be used to show how TI Base applications operate. The entire MICROdex indexing system was developed using TI Base, and its data files are stored in the standard TI Base format. The command (program) files included can be viewed using the TI Base editor, and altered to suit your own needs.



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Due to its large size, MICROdex is divided into two volumes. Thousands of references about the TI-99/4a and Geneve 9640 are recorded, categorized, and stored in those volumes.

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# Feedback

#### Turbo Copy available?

I wonder if you could poll your readers about a program, Turbo Copy by Know Ware. It is a track copier (TI Controller), that is very fast.

This copier is not marketed nor on any fairware list I have seen. I would like to know if it is now public domain or if someone is controlling distribution rights.

This is a fine program and it should be widely available.

Jim Swedlow Stanton, California

#### Keep dreaming

How many of you have TIs that are idle hours when you are at work, and under the same roof sits an elderly, handicapped or limited person?

Why not teach them to use the TI? It amazes me no end here how limited bodies hid eager, enthusiastic minds! The arthritic hands, the ones now shaky with Parkinson and other debilitating diseases can operate the TI easily if you are willing to prepare a few things.

Texas Instruments still modifies consoles for the handicapped so the Function, Control and Shift keys will lock for one-hand use, etc.

Here (Marian Hall), Sisters in their 70s and 80s are eagerly learning. I make letter templates for any who wish to write on the TI using Funnelweb files: AS, AT, CAT, CHARAI, DP, EA, ED, EE, FO, FP. LOAD, MG, MH, QD, UL and Plus! files 1, 2, 3, 4, 5, 6, 7, 8, 9, G1, G2, G3 and L2. For some Funplus disks, I leave out some of the 1-9 disks and add L1 and L3 instead. All that has to be learned then is loading Funnelweb to the editor part and the most commonly used corrections (Function + arrows), the use of Enter, paragraphing (Control 8), saving and using the formatter. Using Jiffy Flyer I have these directions in large print in a binder condensed to the barest essentials.

I am gradually getting other programs that do not have menus menued, with the help of TIers all over and a young volunteer, so every program will autoload into Extended BASIC with a key press of 2 twice so what is needed can be selected from a menu. That is the hardest part, be-

cause the character codes get changed in graphics, and end points in programs are not easily seen by non-programmers like me. No one menu/load to date solves all problems, but one of our computer companies offered to tackle some I have not succeeded in doing. The big problem is getting a program to go back to the menu when it is finished, as I try to avoid multiple keys whenever possible. So many other Tlers have helped with specific problems I could not begin to mention lest I miss any!

My point is, it can be done. None of the residents using the TI ever used a computer before, some like me were not typists either. Our median age here is probably still mid-80s although we have two who are 101, one who will be 101 and another who will be 100. My oldest computer novice is 87; of course with women and age, I may not know — some may be older! Labels are the most exciting starting place as results are so immediate.

I can see the same principles applying in many educational situations, young, elderly and handicapped. It is practical, too. It is interesting also to see how this one prefers one label program, another a different one. Perhaps, since we are primarily a teaching order covering every range of education and caring, my computer learners tend to be selective from habit, but it amazes me to see an 87-year-old willing to try a different program when she has learned one she likes, and use one for some labels and yet another for specific people. Many a younger person would be self-satisfied to know and use only one!

I would like to thank all who have made this dream a reality: the individuals, companies, media involved. Hardware, software and donations have made our Activity Room system complete with two SS/SD disk drives on ground floor, a mini system on third for one resident who is becoming especially proficient and my system on fourth. The two expanded systems now have transformers to stabilize power in our hot, humid Iowa summers. To date, perhaps a dozen Sisters have used the computers with guidance. Some have printed out more than a dozen letters, even with graphics on one side. At Christmas, TI labels abounded on outgoing mail (incoming, too)! Easter is seeing a surge in making labels again, and for newsy letters, computers can handle so much more than fragile bodies.

Thank you for everything, and I hope this inspires you to look at your situation and see if some unborn dreams can be generated and made possible! An impossible dream does not exist, only impossible people who believe and make it happen. Hats off and hearts on to a TI community of impossible people.

Sister Pat Taylor, BVM Dubuque, Iowa

#### More on joystick

Additional to review of Expyx 500 XJ joystick (December 1988) — look at the label and you will see it says "By Konix."

Konix is a small Welsh company which has specialized in making joysticks. Here in the UK the 500XJ is sold as the Konix Speedking and is a very popular joystick.

In 1989 Konix has released a new model of hand-held joystick, sold here as the Navigator. The Speedking has a red livery, the Navigator comes in blue. The Navigator is slightly more comfortable to hold, and has the fire button right at the front, making it suitable for left or right hand operation. It also seems more comfortable in a smaller hand.

Konix has not stopped there but has gone on to design the *ultimate* joystick — fully expanded, the new unit would be comprised of a shell chair, driven in three axes by electric motors, foot pedals and a hand control which can be changed from driving wheel to motorbike controls to airplane joystick to helicopter controls. There is a lever which can be a gear lever. The joystick can be made to judder on crashing. A light pistol with recoil action can be converted to an automatic.

Having designed all this, and targeted at a cost so low as to be unreasonable, Konix found a problem — how to connect all this to an existing computer? The answer has been to build a new computer into it, which will use 800K disks selling for 15 pounds or less, and operate so fast that a program can be effectively 800K long. Launch in the UK is targeted for June '89 with main release for Christmas '89. No U.S. launch

(See Page 9)

# Feedback

(Continued from Page 8)
is anticipated for at least 12 months.
Stephen Shaw
Stockport, Cheshire, England

#### Another monitor

I enjoyed Tom Spillane's article on color monitors in the March 1989 MICRO-pendium and I'm sure that it will help many individuals who want to upgrade their TI or 9640 systems.

While very high resolution is available (at very high prices!), at least one other reasonably priced analog RGB monitor will work well with the Geneve. I've been using a Tandy CM-8 monitor with my Geneve. Radio Shack lists its resolution as 640 x 192 pixels and it requires a separate horizontal and vertical synch. A built-in speaker and a nice set of controls are on the monitor front. It even matches the off-white color of my keyboard. Radio Shack lists this monitor for \$300 but I've seen it on sale occasionally for \$25-\$50 less.

The CM-8 doesn't represent the "top end" of the monitor line, but it is quite comparable to the low-priced Atari and Sony models listed in Tom's article. It is more than adequate for my purposes and MyArt sure looks nice in color.

Dave Lewis Norman, Oklahoma

#### Manual printed now

In reply to W.R. Corker (Feedback, March '89), Mr. H.T. Brashear's review was made using a Proto type card (so stated) and his feedback to us prompted us to print the User Manual (37 pages) which is advertised as such. Full documentation and source code are provided with each P-Gram.

The Editor functions are resident in the P-Gram DSR and do not have to be loaded from disk every time you want to use them, and the Editor also allows you to look at *any* of the other P-Box devices via the CRU addresses.

With all respect for GRAM 0, 1 and 2 which reside in the console and contain the title screen and BASIC, most users who would utilize any changes in the title screen or in BASIC are talented enough to find a better way without accessing those

GROMS.

Bud Mills Horizon Computer Toledo, Ohio

#### Slow pace disappoints

Since January '88 I have bought the Geneve 9640 Card and then Myarc Mouse, and HFDC-Myarc Card with HD-Seagate 251.1, and now I am waiting for the Myarc 512K card.

I have always shipped the warranty sheets to Myarc, but I have never received from Myarc any upgrade of DOS or any other programming language, as Myarc had promised.

I have many Italian friends, old TI99 owners, who come to my house to see how the Geneve works, but nobody decides to buy it, because of the holes of the operating system and above all for the policy of Myarc towards its customers.

Franco Ruffoni Brescia, Italy

#### Myarc meets human error

I have to admit I am "human error" personified, a certified computer klutz, and one of the original "black thumbs" of computerdom. Open files close, RAMS selfdestruct and hard drives get soft when I merely walk by a machine.

To give me customer support, computer companies must commit massive resources to my account. To be operational, I really need *support!* In my case, Myarc has met the challenge and exceeded my wildest expectations.

I purchased a HFDC Card and hard drive in October 1988. Shrinking at the anticipation of such a complex unit, I put it on my shelf until March 1989. At that point, inspired by my 11-year-old son's mastery of the 9640, I was forced to stop procrastinating and show him "what this thing does."

My first step was to call Myarc. How many companies will do more than ask you how your product is doing after six months? Not many. But Myarc treated the drive and controller as new, and Jack Riley worked extensively with me to get everything working.

More than two weeks of largely my er-

rors and failures in following directions, Jack worked tirelessly, including two Saturday afternoons and Sunday, to get the disk formatted and loaded with programs. He sent updated programs to me by modem, walked me through the physical assembly of my unit, mailed me new cables and supporting software, talked me through endless procedures on the computer and finally personally checked out my drive, cables and disk after my mailing them to Birmingham. Jack's analysis confirmed the position of the HAL 9000 computer in the movie 2001 A Space Odyssey: "It is HUMAN ERROR."

Being a walking example of the "if anything can go wrong it will" axiom, I stayed with it and continued to foil Jack's best efforts. Finally one late evening, having failed to follow Jack's directions by not backing up my hard disk to floppies, I wiped everything out with one magnificent gesture at the keyboard.

At this point of hopelessness, Myarc stuck with me. Jack Riley replaced the entire drive with a new one, formatted and loaded the drive for me, and mailed me two copies of the backed up hard disk along with the drive. I consider this to be "deep protection" for my destructive tendencies, and at this point, even I will have a hard time wrecking my system.

With everything running, having the hard drive is like having a new machine. The speed and response are phenomenal! If you don't have a hard drive with your 9640, you are really missing the full potential of the system!

So thanks, Myarc, may you live long and prosper. But stand warned, I am now learning to develop tree structures for my hard drive and will continue to lean on you heavily. Better staff up! I'm convinced that if you can give me good customer service, the rest of the universe should be a piece of cake.

Dick Hill Holland, Michigan

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

#### BASIC

# Your TI can keep you in stitches

By REGENA

First, a note about San Diego. I had a super trip to this year's FEST-WEST. It is great to go to a TI-specific convention and learn what is going on with our computer and see all the new hardware and software — and see how much is still being done with our TI. What I really enjoyed, though, was meeting the people behind the names I've heard before plus renewing friendships with those I've met previously.

I did find out from my San Diego friends that I had made a couple of errors in the January issue of MICROpendium. Line 220

should have FRWY 163 (instead of 16). Line 1160 should have 1700-ACRE (instead of 17-ACRE).

Now, answers to a couple of common problems. If you run a program and get an error message BAD VALUE IN—, and the statement involved is a CALL COLOR statement, you could be using TI Extended BASIC instead of TI "console" BASIC. Remember that the color sets 15 and 16 are available in BASIC but not in Extended BASIC.

If you have the disk system and get the error message MEMORY FULL IN —, the program may not be in error. Remember (as standard practice) to use the procedure

CALL FILES(1) NEW

then OLD DSK1.TITLE

<ENTER>

(to load the program)

If you are not doing file work with more than two files open at a time (such as printing, saving, retrieving, writing to another disk, etc.), this procedure allows enough memory to run larger programs. Several of my earlier programs require this procedure to run the programs properly.

Now to this month's program. Last November I got a knitting machine, and I'm having about as much fun with it as I have with my computers. I just got a basic beginner's model — none of the fancy computer designing stuff that is available. I have knit several sweaters with it. In my family I have four sons (and my sister-in-law has five sons), so if I knit something for a boy in any size, it is bound to fit one of the boys. However, sometimes a particular boy wants a certain color. In either hand knitting or machine knitting, gauge is important — that is, how many stitches and rows to an inch so the pattern can be followed correctly and the size will turn out right.

In knitting, the sample swatch is usually measured and the gauge given for four inches square — how many stitches across in four

inches and how many rows lengthwise in four inches. I was using a calculator converting all measurements in patterns when I realized a computer would make the process much easier. The program this month shows a pattern for a basic knit sweater and can be used for machine knitting or hand knitting. You can add any pattern stitch (such as lace, cables, or tuck stitching) and just keep track of the pattern at shaping edges.

First, choose a size: 2, 4, 6, 8, 10 or 12. The corresponding finished chest sizes are 25, 27, 29, 31, 33 and 35 inches. Next, enter a gauge, such as 26 stitches per four inches and 40 rows per four

inches (a typical gauge with sport-weight varn on my standard knitting machine). The computer will draw the back, front and sleeve sections with the number of stitches to cast on, the length of the ribbing and the row counter readings. The computer will calculate drop-shoulder shaping and the number of stitches for the neck on the back and the front. The computer will also calculate the top sleeve width and the number of stitches to be increased along the sleeve edges. Press the ENTER key after each screen to advance to the next pattern section.

Standard knitting abbreviations are used:

CO - Cast On

**RIB** — Work in ribbing (K1,P1 or K2,P2 or twisted rib)

BO — Bind Off

BO a,a,a,b — (shoulder shaping) Bind Off at the shoulder side a stitches three times, then "b" stitches.

a/b nX — Increase or decrease "a" stitches every "b" rows for "n" times. 1/2 3X would be decrease 1 stitch every two rows three times.

RCXXX — Row Counter starting at 000 and indicating the number of rows knit.

This program allows the option of having the pattern printed on a printer. Be sure to add your own printer configuration in Line 870. If you choose "Y" to have the pattern printed, you will hear the printer after each major section of the sweater. Press ENTER after each screen until the pattern is complete.

This program is an example of a program that might appeal to women, even though many men also knit. Every so often I get asked about computer programs for women, and I didn't realize they (we) had special need. Perhaps this is such a program. This idea for this program can be adapted for other programs or for crocheting. The main idea is that the gauge entered is converted to factors for width

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#### **BASIC**—

#### (Continued from Page 10)

and length, then the pattern simply calculates stitches or rows for measurements.

Lines 200-280 define graphics characters used for drawing the sweater sections. Lines 290-470 allow the user to choose a size by pressing the left and right arrow keys to move the arrow symbol under the size. The choice made is SZ (which may be a number from 1 to 6).

Lines 480-650 receive your input for the gauge. W is the number of stitches per four inches, and L is the number of rows for four inches. Lines 660 and 670 calculate the multiplying factors FW and FL using this gauge. Lines 680-700 determine the length of the ribbing depending on the size chosen. Lines 710-790 calculate different measurements. BLl is the underarm length, and BLl2 is the length from the ribbing to the shoulder. BW is the width of the back. SLW and SLL are the sleeve width and sleeve length. Anything starting with RC is a row counter number.

Lines 800-910 offer the option to use a printer for the pattern. Line 920 calls the subroutine to draw the back of the sweater. Lines 930-1030 calculate how many stitches should be allowed for the neck and what the shoulder shaping should be, then label the picture on the screen. All labels are printed using M\$ as a message, specifying the ROW number and the COL number where printing starts, then Subroutine 2880 is called to print the message on the screen.

Lines 1040-1140 print the instructions for the back. Line 1150 waits for the ENTER key to be pressed before continuing. Line 1160 calls the subroutine to draw the front. Lines 1170-1240 calculate the row where neck shaping begins and the number of stitches in the front on each side of the neck. Lines 1250-1400 print the instructions for the front.

Lines 1420-1610 give more detail for the neck shaping, and Lines 1630-1640 print a few more instructions for the other side of the neck.

Lines 1660 draw and label the sleeve. The bottom and top widths are calculated so the number of stitches can be determined. The difference DIF is the number of stitches that need to be increased, and DEC is the number of rows between increases. Lines 1910-1980 print the sleeve instructions. Lines 2000-2130 print the finishing instructions.

Lines 2160-2580 include the subroutine to draw and label parts of the back. Line 2590-2730 are the subroutine for the front, and the subroutine for the back is called for the common sections. Lines 2740-2870 are the subroutine for the sleeve. Lines 2880-2910 are the subroutine to print a message or label. Lines 2920-2940 are the subroutine to wait until the user presses the ENTER key before continuing. Lines 2950-2980 clear the screen, close the printer if used, and END the program.

If you want to save typing effort, you may have a copy of

KNIT SWEATER, SIZE 8

GAUGE: 20 STS = 4 INCHES

24 ROWS = 4 INCHES

BACK

CO 78 STITCHES.

WORK IN RIBBING FOR 2.5 INCHES.

RC000. KNIT STRAIGHT FOR 10.5 INCHES; RC63

PLACE MARKER FOR SLEEVE.

KNIT STRAIGHT TO RC102; 17 INCHES FROM RIBBING.

SHOULDER SHAPING--

BO 6 STS AT BEGINNING OF NEXT 6 ROWS,

THEN 9 STS AT BEG OF NEXT 2 ROWS.

PUT REMAINING 24 STS ON HOLDER FOR NECK.

FRONT

CO 78 STITCHES.

WORK IN RIBBING FOR 2.5 INCHES.

RC0000. KNIT STRAIGHT FOR 10.5 INCHES; RC63

PLACE MARKER FOR SLEEVE.

KNIT STRAIGHT TO RC86.

NECK SHAPING--

WORK ON RIGHT 32 STS.

BO 1 ST AT NECK EDGE FOR NEXT 3 ROWS.

THEN BO 1 EVERY OTHER ROW TWICE.

WORK STRAIGHT TO RC102.

WORK SHOULDER SHAPING TO MATCH BACK.

PLACE NEXT 14 STS ON HOLDER FOR NECK.

WORK OTHER SIDE OF NECK TO MATCH.

SLEEVE

CO 38 STITCHES.

WORK IN RIBBING FOR 2.5 INCHES.

RCØØØ. INC 1 ST EACH SIDE

EVERY 5 ROWS TO RC66.

LENGTH OF SLEEVE = 11 INCHES.

PUT STS ON WASTE YARN.

SEW SHOULDER SEAMS.

JOIN SLEEVES TO BODY.

SEW UNDERARM SLEEVE AND SIDE SEAMS.

PICK UP STS AROUND NECK AND KNIT IN RIBBING FOR 1 INCH.

BIND OFF.

this program by sending \$4 to REGENA, P.O. Box 1502, Cedar City, UT 84720. Be sure to specify whether you need cassette or disk and that you want "SWEATER for the TI.

#### **SWEATER**

100 REM SWEATER !245 110 REM BY RECENA !071 12Ø CALL CLEAR !2Ø9

13Ø PRINT " \*\* KNIT SWRATE

R \*\* !Ø49

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#### BASIC-

(Continued from Page 11) 140 CALL CHAR (35, "081C2A4908 Ø8Ø8Ø8")!Ø12 150 PRINT: : "YOU MAY CHOOSE A SWEATER" ! 102 160 PRINT "SIZE THEN ENTER Y OUR OWN" !238 170 PRINT "KNITTING GAUGE," ! 145 18Ø CALL CHAR (37, "FF") !Ø48 19Ø PRINT "THE PATTERN WILL APPEAR ON THE SCREEN." !198 2007 FOR C=96 TO 117 !219 210 RKAD (\$ !254 22Ø CALL CHAR(C,C\$)!Ø81 23Ø NEXT C !217 240 DATA FFFFFFFFFFFFFFF, Ø OCCONORTEFFFFFFF, OCCOOCCOPFFFF FFFF, 00000000000000000FFFFFF, 0000000 **000000**FFFF ! 166 OMEFEFFIFFF, CONFORCEFFFFFF ØØ3ØF3FFF !2ØB 260 DATA Ø30F3FFFFFFFFF,00 ØØSF3F3F3F3FFF, FFFFFFFFFFFFFF F7F,7F7F3F3F3F3F3F1F,1F1F1F1 FOFOFOFOF ! 0003 270 DATA ØFØ7Ø7Ø7Ø7Ø7Ø1Ø3Ø3,Ø3 Ø3Ø3Ø1Ø1Ø1Ø1Ø1 , FFFFFFFFFFFFF EFF, FEFFEFCFCFCFCF8, F8F8F8F 8FIOREOFF 1033 280 DATA FOR OFFICE OFFICE OFFICE (CAC Ø000808080808 ! 154 290 PRINT::: "CHOOSE SIZE DESTRED: " !Ø12 300 PRINT:" 2 4 6 8 10 12" !Ø68 310 PRINT " #": : : !232 32Ø ROW=21 !227 33Ø SZ=1 !1Ø1 34Ø AR=2+3\*SZ !121 35Ø CALL KEY(Ø,K,S)!187 36Ø CALL HCHAR (ROW, AR, 35) !Ø9 370 CALL HCHAR (ROW, AR, 32) 100 3 380 IF K=13 THEN 480 1021 39Ø IF (K<>68)\*(K<>100)THEN 45Ø !133 400 SZ=SZ+1 !211 410 IF SZ<6 THEN 340 !189 42Ø SZ=6 !1Ø6 43Ø AR=3+3\*SZ !122 440 GOTO 350 !174 450 IF (K<>83)\*(K<>115)THEN

350 1036 46Ø SZ=SZ-1 !212 470 IF SZ<1 THEN 330 ELSE 34 Ø !Ø/7 480 PRINT:::: "KNIT A SAM PLE SWATCH. " !221 490 PRINT: "ENTER THE STITCH GAUCE" !Ø37 500 PRINT "(WIDTH)." !106 510 PRINT: "ENTER STITCHES I N 4 INCHES." 1075 52Ø INPUT W !233 530 W=INT(W+.5)!150 540 IF W=0 THEN 2950 !156 550 IF (W>=15)+(W<=36)=-2 TH EN 58Ø ! 1Ø1 560 PRINT: "INSTRUCTIONS ARR FOR STITCH GAUGE FROM 15 TO 36. ": : !Ø5Ø 57Ø GOTO 51Ø !Ø78 580 PRINT: "FINITE ROW GAUGE (LENGTH), " ! 177 590 PRINT: "HOW MANY ROWS IN 4 INCHES?" 10004 600 INFUT L !222 61Ø L=INT(L+.5)!128 62Ø IF L=Ø THEN 295Ø !145 63Ø IF (L>=2Ø)+(1<=52)=-2 TH EN 66Ø !153 640 PRINT: "INSTRUCTIONS ARE FOR ROW GAUCE FROM 20 TO 52. ": :!181 65Ø GOTO 59Ø 1159 660 FW=W/4 !115 67Ø FL=L/4 !Ø93 68Ø RIB=2 !15Ø 69Ø IF SZ<4 THEN 71Ø 1Ø46 7000 RIB=2.5 !251 710 BL1=6.5+SZ 1079 72Ø RC1=INT(Bid\*EL+, 5)!194 73Ø RC1\$=STR\$(RC1)!182 74Ø SLW=7+1.5\*SZ 1068 75Ø SLL=5+1,5\*SZ 1Ø55 76Ø BL2::BL1+SLW/2 : 1179 770 RC2=INT(H2\*F1+.5)!196 78Ø BW=11.5+SZ 1Ø86 79Ø CO∷INT(BW\*FW+.5)!115 800 PRINT: : : "DO YOU WANT A PRINTED COPY OF THIS PATT HRN? (Y/N)" !194 810 CALL KEY(0, K, S) ! 187 82Ø IF (K=78)+(K=11Ø)THEN 92 Ø !219 83Ø EF (K<>89)\*(K<>121)THEN 810 1245 84Ø REM PUT YOUR PRINTER !13

850 REM CONFIGURATION IN 110 5 860 REM LINE 870 1225 87Ø OPEN #1: "RS232. BA=6ØØ" ! 222 88Ø PR=1 !Ø9Ø 89Ø PRINT #1: TAB(10); "KNIT S WEATER, SIZE"; SZ\*2: ::!159 900 PRINT #1: "GADGE: ":W: "S TS = 4 INCHES" !019910 PRINT #1: TAB(9); L; "ROWS = 4 INCHES": ::!050 92Ø GOSUB 217Ø !21Ø 93Ø NK=3.33+.33\*SZ !122 940 SHS=INT((CO-NK\*FW)/2+.5) 10779 95Ø NKS=CO-2\*SHS ! 17Ø 96Ø SH4=INT (SHS/4) ! 12Ø 97Ø SH5=SH5-3\*SH4 !2Ø4 98Ø S\$=STR\$(SH4)!Ø76 99Ø GOGUB 254Ø 1Ø69 10000 MS=STR\$(NKS)!099 1010 ROW=1 !176 1020 COL=13 !202 1030 GOSUB 2880 !155 1040 IF PR<>1 THEN 1150 !154 1050 PRINT #1: "BACK" !036 1060 PRINT #1: "(X)"; (X); "STITC HES. " !0002. 1070 PRINT #1: "WORK IN RIBBI NG FOR"; RIB; "INCHES. " 1959 1080 PRINT #1: "RC000. STRAIGHT FOR"; H.1; "INCHES; R C"; RC1\$ !19Ø 1000 PRINT #1: "PLACE MARKER FOR SLEEVE. " ! 135 1100 PRINT #1: "KNIT STRAIGHT TO RC"; STR\$(R(2); "; "; BL2; " INCHES FROM RIBBING." 1977 1110 PRINT #1: "SHOULDER SHAP ING-" !Ø11 112Ø PRINT #1: "BO"; SH4; "STS AT BEGINNING OF NEXT 6 ROWS. "!Ø33 1130 PRINT #1: "THEN"; SH5; "ST S AT HIG OF NEXT 2 ROWS. " !2 47 1140 FRINT #1: "FUT REMAINING "; NKS; "STS ON HOLDER FOR NEC K. " !Ø12 115Ø CXSUB 292Ø !195 1.16Ø GOSUB 26ØØ !13Ø 117Ø H.3=H.2-3+, 2\*(6-SZ)!134 118Ø RC3=INT(FL3\*FL+, 5)!198 (See Page 13)

#### **BASIC**—

(Continued from Page 12)
119Ø CALL HCHAR(4,22,37)!ØØ2
1200 MS-"RC"&STR\$ (RC3) !085
121Ø ROW=4 !179
122Ø (X)[=22 !2Ø2
123Ø QOSUB 288Ø !155
1240 RT=SHS+5 !017
125Ø JF FR<>1 THKN 141Ø !159 126Ø FRINT #1 !147
1260 IRINI #1 !147
127Ø PRINT #1: "FRONT" ! 157
128Ø PRINT #1: "CO"; CO; "STITC
HES. " 10002
1290 PRINT #1: "WORK IN RIBBI
NG FOR"; RIB; "INCHES." 1059
1300 PRINT #1: "RCXXXX KNIT
STRAIGHT FOR"; H.1; "INCHES; R
C"; RC1\$ ! 19Ø
1310 PRINT #1: "PLACE MARKER
EYO CI FEVE " 119K
FOR SLEEVE." !135 1320 PRINT #1: "KNIT STRAIGHT
1928 LUMI 61. Will SHARM
TO RC"; STR\$ (RC3); ". "! 196
133Ø PRINT #1: "NECK SHAPING-
-" !194
134Ø FRINT #1: "WORK ON RIGHT
"; RT; "STS. " !187
1350 PRINT #1: "BO 1 ST AT NE
CK EDGE FOR NEXT 3 ROWS," !Ø
88
1360 PRINT #1: "THEN BO 1 EVE
DV OTHER ROW TWICE " 1143
137Ø PRINT #1: "WORK STRAIGHT
TO RC"; STR\$ (RC2); ". " !208
138Ø PRINT #1: "WORK SHOULDER
SHAPING TO MATCH BACK. "!21
3
1390 PRINT #1: "PLACE NEXT"
; NKS-10; "STS ON HOLDER FOR N
ECK." ! 188
1400 PRINT #1: : "WORK OTHER
SIDE OF NECK TO MATCH." !131
141Ø COSUB 292Ø !195
142Ø CALL CLEAR !2Ø9
1430 PRINT "NECK SHAPING: "!
245
1440 PRINT "WORK ON RIGHT"; R
T; "STS. " !Ø15
1450 PRINT: "BO 1 ST AT NECK
1400 LKINI - DO I 21 VI MAY
EXE" !225
1460 PRINT "EVERY ROW 3 TIME
s," !Ø57
1470 PRINT "THEN EVERY OTHER
ROW TWICE." !22Ø
1470 PRINT "THEN EVERY OTHER ROW TWICE." !220 1480 PRINT : "KNIT STRAIGHT T
O RC";STR\$(RC2);"." !204
149Ø PRINT: "HO SHOULDER TO
MATCH BACK. ": :: ! 1823
The state of the s

1500 PRINT "	````%
RC"; STR\$ (RC2) !Ø82	
151Ø PRINT "	
!21Ø	
1520 PRINT "	
!21Ø	
153Ø PRINT " 1018	
154Ø PRINT "	
1018	
1550 PRINT "	
1/2 2X" !181	
156Ø PRINT "	
1082	
157Ø FRINI "	,,,,
1/1 3X" !245 1580 PRINT "	
1580 EKINI	
159Ø PRINT "	
1018	
1600 PRINT "	***************************************
RC";STR\$(RC3);!Ø/1	
161Ø GXGUB 292Ø !195	
162Ø CALL CLEAR !2Ø9	
1630 PRINT "FUT "; NKS-1	Ø; "ST
S ON HOLDER": "FOR FRONT	NECK
." !18Ø 164Ø PRINT : "WORK OTHER	CIPE
TOAK LIVINI · WAW OTINA	
OF NECK TO MATCH."	: : :
OF NECK TO MATCH."	: : :
OF NECK TO MATCH." ! 122 165Ø GOGUB 292Ø ! 195	: : :
OF NECK TO MATCH." !122 165Ø GOSUB 292Ø !195 166Ø GOSUB 275Ø !Ø24	: : :
OF NECK TO MATCH." !122 165Ø COSUB 292Ø !195 166Ø COSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16	: : :
OF NECK TO MATCH." !122 165Ø COSUB 292Ø !195 166Ø COSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5	: : : 7 )!Ø89
OF NECK TO MATCH." !122 165Ø COSUB 292Ø !195 166Ø COSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5) 169Ø TOP=INT (SLW*FW+.5)	7 ) !Ø89 !Ø49
OF NECK TO MATCH." !122 1650 COSUB 2920 !195 1660 COSUB 2750 !024 1670 SLW2=5.5+.5*SZ !16 1680 COW=INT(SLW2*FW+.5 1690 TOP=INT(SLW*FW+.5) 1700 DIF=INT((TOP-COW)/	7 ) !Ø89 !Ø49
OF NECK TO MATCH." !122 1650 COSUB 2920 !195 1660 COSUB 2750 !024 1670 SLW2=5.5+.5*SZ !16 1680 COW=INT (SLW2*FW+.5 1690 TOP=INT (SLW*FW+.5) 1700 DIF=INT (TOP-COW)/	7 )!Ø89 !Ø49 2)!15
OF NECK TO MATCH." !122 1650 COSUB 2920 !195 1660 COSUB 2750 !024 1670 SLW2=5.5+.5*SZ !16 1680 COW=INT (SLW2*FW+.5) 1690 TOP=INT (TOP-COW) / 1 1710 RC4=INT (SLL*FL+.5)	7 )!Ø89 !Ø49 2)!15
OF NECK TO MATCH." !122 165Ø COSUB 292Ø !195 166Ø COSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5 169Ø TOP=INT (SLW*FW+.5) 17ØØ DIF=INT (TOP-COW)/ 1 171Ø RCA=INT (SLL*FL+.5) 172Ø DKC=INT (RCA/DIF) !Ø 173Ø ROW=22 !228	7 )!Ø89 !Ø49 2)!15
OF NECK TO MATCH." !122 1650 COSUB 2920 !195 1660 COSUB 2750 !024 1670 SLW2=5.5+.5*SZ !16 1680 COW=INT (SLW2*FW+.5) 1700 DIF=INT (TOP-COW)/ 1 1710 RC4=INT (SLL*FL+.5) 1720 DEC=INT (RC4/DIF) !0 1730 ROW=22 !228 1740 COL=5 !154	7 )!Ø89 !Ø49 2)!15 !241
OF NECK TO MATCH." !122 165Ø GOSUB 292Ø !195 166Ø GOSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5) 169Ø TOP=INT (SLW*FW+.5) 17ØØ DIF=INT (TOP-COW)/1 171Ø RCA=INT (SLL*FL+.5) 172Ø DEC=INT (RCA/DIF)!Ø 173Ø ROW=22 !228 174Ø COL=5 !154 175Ø M\$="CO "&STR\$ (COW)	7 )!Ø89 !Ø49 2)!15 !241 !88
OF NECK TO MATCH." !122 165Ø GOSUB 292Ø !195 166Ø GOSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5) 169Ø TOP=INT (SLW*FW+.5) 17ØØ DIF=INT (TOP-COW)/1 171Ø RCA=INT (SLL*FL+.5) 172Ø DEC=INT (RCA/DIF)!Ø 173Ø ROW=22 !228 174Ø COL=5 !154 175Ø M\$="CO "&STR\$ (COW) IB "&STR\$ (RIB) &CHR\$ (34)	7 )!Ø89 !Ø49 2)!15 !241 !88
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OF NECK TO MATCH." !122 165Ø GOSUB 292Ø !195 166Ø GOSUB 275Ø !Ø24 167Ø SLW2=5.5+.5*SZ !16 168Ø COW=INT (SLW2*FW+.5 169Ø TOP=INT (SLW2*FW+.5) 17ØØ DIF=INT (TOP-COW)/ 1 171Ø RCA=INT (SLL*FL+.5) 172Ø INC-INT (RCA/DIF) !Ø 173Ø ROW=22 !228 174Ø COL=5 !154 175Ø MS="CO "&STR\$ (COW) IB "&STR\$ (RIB) &CHR\$ (34) 176Ø GOSUB 288Ø !155 177Ø ROW=ROW-1 !1Ø6 178Ø COL=14 !2Ø3 179Ø MS="%RCXØØ" !Ø7Ø 18ØØ GOSUB 288Ø !155 181Ø ROW=ROW-9 !114 182Ø MS="%RCW&STR\$ (RCA) 183Ø GOSUB 288Ø !155 184Ø MS="1/"&STR\$ (DEC)& "&STR\$ (SLL) &CHR\$ (34) !Ø6	7 )!Ø89 !Ø49 2)!15 !241 68 &"; R !122

53 188Ø ROW=ROW-5 !11Ø 189Ø COL=7 !156 1900 GOSUB 2880 !155 191Ø IF PR<>1 THEN 199Ø !229 1920 PRINT #1: : "SLEEVE" !14 193Ø PRINT #1: "CO"; COW; "STIT CHES. " 1089 1940 TRINT #1: "WORK IN RIGHT NG FOR"; R1B; "INCHES." !059 1950 PRINT #1: "RODOD. INC 1 ST FACH SIDE" !206 196Ø PRINT #1: "EVERY"; DEC; "R OWS TO RC"; STR\$ (RC4); ". " !21 197Ø PRINT #1: "LENGTH OF SLE EVE ="; SLL; "INCHES. " !226 1980 FRINT #1: "PUT STS ON WA STE YARN." !033 199Ø GXGUB 292Ø !195 2000 CALL CLEAR !209 2010 PRINT "SEW SHOULDER SEA MS. "!178 2000 PRINT: "JOIN SLEEVES TO HODY." !211 2000 PRINT: "SEW UNDERARM SL EEVE AND SIDE SEAMS." !Ø 15 2040 PRINT: "PICK UP STS ON NECK AND RIB FOR 1 INCH.": : : !226 2050 PRINT: "BIND OFF." ! 103 2060 JF PR<>1 THEN 2140 !124 2070 FRINT #1 !147 2080 PRINT #1: "SEW SHOULDER SEAMS." 1094 2090 PRINT #1: : "JOIN SLEEVE S TO HODY." !127 2100 PRINT #1: : "SEW UNDERAR M SLEEVE AND SIDE SEAMS." !Ø 55 2110 PRINT #1: : "PICK UP STS AROUND NECK AND" 10002 2120 PRINT #1: "KNIT IN RIBBI NG FOR 1 INCH." !252 213Ø PRINT #1: : "BIND OFF." 1019 214Ø GOSUB 292Ø !195 215Ø 00TO 295Ø !224 216Ø REM BACK !235 217Ø CALL CLEAR !2Ø9 2.18Ø M\$="BACK" !Ø11 219Ø ROW=1 !176 2200 COL=3 !152 (See Page 14)

#### BASIC-

(Continued from Page 13)	2484 CALL DELIAD (2. DO 27.) LOWY	O'MOA HOUSE HOLERTHIN
221Ø COSUB 288Ø !155	2480 CALL HCHAR (3,22,37) !0001 2490 MS="RC"&STR\$ (RC2) !0034	276Ø PRINT "SLEEVE": : : : !Ø
222Ø FOR C=8 TO 21 !1Ø8	2500 ROW-3 !178	Ø1 277Ø PRINT " 1''''''q" !Ø
223Ø CALL VCHAR(3,C,96,2Ø)!Ø	251Ø COSUB 288Ø !155	277Ø PRINT " 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Ø8	2520 RETURN !136	278Ø PRIMT " m''''r"!Ø
224Ø NEXT C !217	2530 REM SHOULDER 1064	78
2250 RESTORE 2300 1097	2540 MS="BO "&S\$&","&S\$&","&	279Ø PRINT " n''''s" !Ø
226Ø FOR C=8 TO 22 !1Ø9	S\$&","&STR\$ (SH5)!Ø11	8Ø
227Ø READ N !229	255Ø ROW=1 !176	1-7-
228Ø CALL HCHAR(2,C,N)!Ø47	2560 COL=17 !206	2800 FRINT " o````t" !0 82
229Ø NEXT C !217	257Ø GOSUB 288Ø !155	2810 PRINT " p'''''u" !0
2300 DATA 101,100,99,98,97,9	258Ø RETURN ! 136	84
7,97,97,97,97,98,99,100,101,	2590 REM FRONT 1099	282Ø PRINT " '1''''q" !17
32 1072	2600 CALL CLEAR !209	1
2310 CALL HCHAR (22,8,32) !001	2610 M\$="FRONT" !132	283Ø PRINT " m'''r" !17
2320 CALL HCHAR (22,21,32) !04	262Ø RO₩=1 !176	3
5	263Ø COI≓3 ±152	2840 FRINT " n```s" !17
233Ø CALL HCHAR(11,7,37)!ØØ8 -	264Ø COGUB 288Ø !155	5
2340 CALL HCHAR (11,22,37) 104	265Ø GOSUB 222Ø 1ØØ4	285Ø PRINT " o````t" !17
9	2660 CALL HCHAR(2, 12, 102) 104	7
2350 CALL HCHAR (22,22,37) !05	1	286Ø PRINT " p''''u": :
1	2670 CALL HCHAR(2,13,32,4)!1	: !210
2360 M\$="RO000" !032	71	287Ø RETURN ! 136
237Ø ROW=22 !228	268Ø CALL HCHAR(3,13,103)!Ø4	2880 FOR J=1 TO LEN(MS)!242
238Ø COL=22 !2Ø2	4	2890 CALL HCHAR (ROW, COL+J, AS
239Ø GOSUB 288Ø !155	2690 CALL HCHAR (3, 14, 104) 104	C(SEC**(M**,J,1)))!Ø45
2400 Ms="CAST ON "&STR\$((X))&	6	2900 NEXT J 1224
'; RIB "&STR\$ (RIB) &CHR\$ (34) !	2700 CALL HCHAR (3, 15, 105) 104	291Ø RETURN !136
126	8	2920 CALL KEY (0, K, S) ! 187
24 1Ø`ROW=23   !229	2710 CALL HCHAR (3, 16, 106) 105	2930 IF K<>13 THEN 2920 ! 104
242Ø (XXI=8 ±157	Ø	294Ø RETURN !136
243Ø GOSUB 288Ø !155	2720 CALL HCHAR(2,17,107)!05	295Ø CALL CLEAR !2Ø9
2440 MS="RC"&HC1\$ 1007	1 07700 177100 1400	296Ø IF FR<>1 THEN 298Ø !199
245Ø ROW=11 !226	273Ø RETURN !136	297Ø CLOSE #1 !151
2460 COL=22 !202 2470 COSOB 2880 !155	274Ø REM SLEEVE - !254 275Ø CALL CLEAR !2Ø9	298Ø END !139
41V GBHK 2880 1355		

#### EXTENDED BASIC

# Good help is hard to find

By JERRY STERN ©1989 J.L. Stern

You've written a dynamite program for keeping track of kumquat sales at the kumquat agency. But you know that the head kumquat analyst, whose name we had best leave to the imagination, will copy your program to who knows where, lose the instructions you typed for him, and smear your beautifully printed help file with globs of overripe kumquat. A help file as a

separate disk file is something he just won't remember how to print while he is in a state of kumquat-induced slovenliness. Your help file must be entirely inside the program.

There are limits to how much work you are willing to do for his kumquatosity. Rewriting the program to bring help on-line is not worthwhile for a small application that will only be used in the Kumquat Emporium of lower Main Street. Perhaps the help file that you've already typed up for

your kumquat client could be placed within the main program as a series of data statements, and read back to either the screen or a printer by a subprogram as kumquat splashes require.

Using a subprogram to print or view the subprogram is much easier than placing that new function inside the already finished program. The variables of subprograms are stored separately by TI Extended BAS-

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#### **EXTENDED BASIC—**

#### (Continued from Page 14)

IC for each subprogram, and are also distinct from variables in the main program. The variable LOOP in a subprogram is different from a variable of the same name in the other sections of the program. This division of a program into compartments means that repeating variable names accidentally will not cause any problems in executing the program. So when additions need to be made in a finished program, the easiest way to add new functions is by including them in subprograms. The new subprogram can be just merged into the original program at the end of the code, and it will go promptly to work with a minimum of debugging.

Retyping the entire help file into DATA statements could cause some bugs, too. The ideal would be to transfer the help file directly into DATA statements without retyping it. Sounds like we need a utility program that converts a Display/Variable 80 TI-Writer file into a merge format program segment of text data lines.

We already know that our help file will start as a Display/Variable 80 file, and end as a Display/Variable 163 merge file, but the exact format of those lines could still change. To help find the most practical format for these lines, we'll first look at the subprogram that will handle displaying those data lines.

The subprogram HELP will read one screen of the help file at a time, fill the screen, wait for a keystroke, and then go on to the next screen load. Each line of the data should be no longer than the width of the screen, or 28 characters for the 99/4A. The subprogram reads the number of data statements in the total file from the first DATA statement in the group. This is needed to prevent reading past the end of the list, either into data statements intended for another section of the program, or past the end of the program. For the same reason, if the main program that uses this subprogram allows HELP to be called more than once, the RESTORE statement must be used to reset the spot where the program will look for the DATA statements.

100! main program 300 RESTORE 1000::CALL HELP 400! more main program 1000 DATA 2 1010 DATA "You call this a help file?" 1020 DATA "Well, good help is hard to find."

#### **29415 SUB HELP**

Alternatively, the RESTORE statement in line 300 could be used to direct the help subprogram to one of several different help files. DATA statements starting at line 2000 might contain help on cooking kumquats, and instructions for cleaning up kumquat stains could start at line 2500.

Retyping the entire help file into DATA statements could cause some bugs, too. The ideal would be to transfer the help file directly into DATA statements without retyping it.

By changing the length of the DATA statements, a subprogram could just as simply print out a help file or a quick reference sheet. I've already set this up as the subprogram HELP2. This subprogram is simpler than HELP; it only requires the name of the printer in the CALL statement. 300 RESTORE 1000 :: CALL HELP2 ("PIO")

So far, we have an extremely simple help procedure that uses subprograms to display help or print reference sheets. Next, let's work on a way to convert a TI-Writer text file into a list of DATA statements that can be merged into an application program. The program DATALETTER will do this. For input, the program will need the name of the text file, the name of the merge file it should create, the line number to use for the first line of the file, and an increment to use as the spacing between line numbers in the merge file.

Let's look at the program. The lines 100 to 130 demonstrate another way to provide a help file. The few reminders needed to run the program are included in remark statements. I know some programmers who consistently place a page full of instructions as remarks between lines 10 and 90 of their programs. If they need help, they just type, LIST -100, and the comments are displayed for them. This is adequate when programming for other programmers, but our kum-

quat analyst has only just managed to attain literacy in fruit, so expecting him to remember to LIST the program might be a bit too much.

Line 130 creates our line numbers in "crunch," or internal token format. Crunch format stores all program statements as lists of numbers, from zero to 255. Each number is stored as one byte of information. The line numbers in Extended BASIC are always two bytes long at the beginning of a line, and three bytes long in the middle of a line, as in IF L=5 THEN 400. For example, here is how some line numbers are represented, both at the beginning of a line, and in the middle.

Line	Beginning	Middle
10	0,10	201,0,10
100	0,100	201,0,100
300	1,44	201,1,44
1000	3,232	201,3,232
32767	127,255	201,127,255

The 201 is only a symbol that tells the Extended BASIC interpreter that the two numbers that follow are a line number. The first integer in the line number will never be larger than 127, or two to the 7th power minus one. The second integer will not be larger than 255, or two to the eighth power less one. To convert these bytes of memory back to our own base ten numbers, multiply the first byte by 256, and add the result to the second byte. The largest line number would then be 127, 255, or in base 10: 127 \* 256 + 255 = 32767

Line 130 has to work the other way around, converting base 10 line numbers to crunch format. If S is the line number, than the crunch format line number will be CHR\$ (INT (S/256)) &CHR\$ (S-INT (256)\*256)

Rather than using this awkward formula wherever we need it, line 130 includes it as a definition statement:

13Ø DEF CR\$(S)=CHR\$(1NT(S/256))&CHR\$(-1NT(S/256)\*256)

Line 140 simply calls a subprogram to create a title screen, keeping the main program uncluttered and easy to read.

Lines 150 to 170 accept the name of the text file from the keyboard and checks to see if it is a legal name. If your system uses a drive number other than one through five,

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#### EXTENDED BASIC-

#### (Continued from Page 15)

be sure to change the first VALIDATE string in line 160 to allow for it, and do the same in line 180. Lines 180 to 190 obtain and check the name of the destination, or merge file. Similarly, the lines from 200 to 240 check the line numbers and increments to be used in the new file to see if they are reasonable. If the program rejects any of these names or numbers, it will make a gun sound effect and ask for the input again.

The sound effect of the gunshot is in a subprogram. This makes it easy to change to chimes, buzzes, beeps, or whatever type of sound you may want. Sound effects work particularly well as subprograms since no data needs to be passed back to the main program. This one was just merged into the program, and originated in another project many uses ago.

Finally, starting at line 250, the loop that gets the work done begins. The program checks that there is still data left in the text file, reads in the next line, checks to see if the line is the string "\*\*\*\*\*" that we have used to flag the end of our data file, and then converts the text string to a data line.

The first line in the file will not use the first line number. That first line number will be left unused for now, because it will be used to store the count of how many data lines were converted. That line, with the lowest line number, will be printed to the file last, even though it will be the first line in the new program segment. When Extended BASIC merges the file into the main

program later on, it will not mind that the first line is in the last position; it will simply merge it into the proper place in the program.

Next, the processing of the line is begun. Line 270 checks to see if the TI-Writer Formatter has left any line feeds or carriage returns at the end of the line, and removes any it finds. Finally, the actual DATA statement is constructed.

In crunch format, a DATA statement containing a text string consists of a two byte line number, followed by the token for DATA, which is 147, and then the token for a string (number 199), the number of characters in the string, the string itself, and the line ending token 0.

1000 DATA "HI" becomes

1999 DATA 3, 232, 147. 199, 2, 72, 73, 8

So, if L is the line number, CR\$ is the line number formula from the DEF statement in line 130, and R\$ contains the data, the new line T\$ must be:

T\$=CR\$(L)&CHR\$(147)&CHR\$(199) &CHR\$ (LEN (R\$) ) &R\$&CHR\$ (Ø)

Once the program has looped around and converted all the data, the count of data lines must be added to the file, but DATA lines containing strings are not the same as DATA lines containing numbers. To place the number in a DATA line as a number and not as a string, some different treatment is needed. Instead of the token 199 for a string, a number is indicated by the token 200. The length of the number as a string is still needed even though Extend-

ed BASIC will read the result as a number. In line 300, the line count is converted from a number to a string, and then is inserted into a formula nearly the same as the one

T\$=STR\$(C)

CR\$(Z)&CHR\$(147)&CHR\$(200)&CH HR\$ (LEN (T\$))&T\$&CHR\$ (Ø)

Done, right? No. All merge files must end with an "end of file" indicator. That is simply one line that reads 255, 255. Then both the files may be closed and the job is done.

Before you go running off to convert your kumquat calculations, take some time to prepare the text file first. By running the original text file through the TI-Writer Formatter to another text file, you can do any of the fancy formatting to the file on disk that could be done on paper. The text may be filled, adjusted, indented, as you desire. First, insert this Formatter command at the beginning of the file:

.PL N;TL 34:34,34 (and the required carriage return.)

This will, when N is a larger number than the number of lines in the file. eliminate all page breaks. The TL command will convert single quotation marks into the double quotation marks that Extended BASIC will understand inside a data string. Next, set the right margin at 28 for a file destined to be viewed on screen with the HELP subprogram, or at up to 80 if the file will be printed out with HELP2. Be sure to add "\*\*\*\*\*" as the last line of the file.

#### **DATALETTER**

100 ! DATALETTER JLS 1989V 2.0 !215 !242 110 ! SOURCE FILE MUST BE FO RMATTED ".PL N;TL 34:34,34" WHERE N IS GREATER THAN NUMB ER OF LINES FOR FILE !118 !1 47 120 ! SOURCE FILE LAST LINE BEFORE FORMATTING MUST BE "\* \*\*\*\*" !132 !157 130 DEF OR\$(\$)=OHR\$(1NT(\$/25 6))&CHR\$(S-INT(S/256)\*256)!1 80 ! 208 140 CALL TITLE !236 !010 150 DISPLAY AT(10,1): "NAME O

F SOURCE D/V80 FILE?": "DSK1. FILE:"" :"NAME OF NEW MERGED FILE?": "DSK1.";" FILE:"" """ !158 !191 160 ACCEPT AT(11,4)SIZE(-1)V ALIDATE("12345"): Z :: ACCEPT AT(11,15)SIZE(10)VALIDATE(U ALPHA,DIGIT,"\_"):\$\$ !066 !09 7

170 IF S\$="" THEN CALL GUN : : GOTO 160 ELSE Y=ASC(SEG\$(S \$,1,1)):: IF Y=95 OR Y<65 TH EN CALL GUN :: GOTO 160 ELSE S\$="DSK"&STR\$(Z)&"."&S\$ !08 2 ! 111 180 ACCEPT AT(14,4)SIZE(-1)V ALIDATE("12345"): Z :: ACCEPT AT(14,15)SIZE(10)VALIDATE(U ALPHA, DIGIT, "\_"):D\$ !057 !08

190 IF D\$="" THEN CALL GUN : : GOTO 180 ELSE Y=ASC(SEG\$(D \$,1,1)):: IF Y=95 OR Y<65 TH EN CALL GUN :: GOTO 180 ELSE D\$="DSK"&STR\$(Z)&"."&D\$ !06 2 !089

200 DISPLAY AT(16,1):"FIRST LINE NUMBER TO USE?":"""

(See Page 17)

#### EXTENDED BASIC—

(Continued from Page 16) INCREMENT? "" !15 5 ! 185 210 ACCEPT AT(17.2)VALIDATE( DIGIT)SIZE(5):Z :: IF Z=0 OR Z>32767 THEN CALL GUN :: GO TO 210 !000 !019 220 ACCEPT AT(17,22)VALIDATE (DIGIT)SIZE(3):Y :: IF Y=0 T HEN CALL GUN :: GOTO 220 !14 3 ! 170 230 L=Z+Y :: OPEN #1:S\$.DISP LAY , VARIABLE 80, INPUT :: OP EN #3:D\$,DISPLAY ,VARIABLE 1 63,OUTPUT !117 !145 240 C=0 !250 !020 250 IF EOF(1)THEN 300 !091 ! 120 260 LINPUT #1:R\$ :: IF SEG\$( R\$.1.5)="\*\*\*\*\*" THEN 300 !23 7 !012 270 IF ASC(SEG\$(R\$,LEN(R\$),1 ))<32 THEN R\$=SEG\$(R\$,1,LEN( R\$)-1):: GOTO 270 !225 !253 280 T\$=CR\$(L)&CHR\$(147)&CHR\$ (199)&CHR\$(LEN(R\$))&R\$&CHR\$( 0)!072 !100 290 PRINT #3:T\$ :: L=L+Y :: C=C+1 :: GOTO 250 !000 !019 300 T\$=STR\$(C):: PRINT #3:CR \$(Z)&CHR\$(147)&CHR\$(200)&CHR \$(LEN(T\$))&T\$&CHR\$(0)!160 !1 310 PRINT #3:CHR\$(255)&CHR\$( 255):: CLOSE #1 :: CLOSE #3 !138 !169 320 STOP !152 !179 31530 SUB TITLE !240 !009 31540 DISPLAY AT(1.9)ERASE A LL: "DATALETTER" :: CALL CHAR (95,"00FF"):: CALL HCHAR(2,1 1.95.10)!115 !141 31545 DISPLAY AT(4.5): "CONVE RSION UTILITY" !149 !182 31560 SUBEND !168 !202 32575 SUB GUN !086 !119 32580 ! GUN SOUND EFFECT SIN GLE SHOT: JLS- 12/85 !178 !21 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 ! 168

#### SUB HELP

29415 SUB HELP !150 29420 ! READS INTERNAL DATA FILE FOR HELP JLS 4/89 !086 29425 ! DATA SHOULD BE 28 CH ARACTERS LONG !045 29430 READ L :: CALL CLEAR ! 054 29435 FOR X=1 TO 22 :: L=L-1 :: READ T\$ :: DISPLAY AT(X, 1):T\$ !083 29440 IF L=0 THEN X=22 !123 29445 NEXT X :: GOSUB 29450 :: CALL CLEAR :: IF L>0 THEN 29435 ELSE 29465 !087. 29450 FOR D=1 TO 100 :: NEXT D !241 29455 DISPLAY AT(24,2):"PRES S ANY KEY TO CONTINUE" !088 29460 CALL KEY(0,K,S):: IF S <1 THEN 29460 ELSE RETURN !2</p> 29465 SUBEND ! 168

#### **SUB HELP2**

29380 SUB HELP2(D\$):158
29385 ! PRINTS INTERNAL DATA
FILE FOR HELP JLS 2/89 !197
29390 ! D\$ :DESTINATION PRIN
TER !235
29395 OPEN #9:D\$,DISPLAY ,VA
RIABLE 136 !027
29400 READ L :: FOR X=1 TO L
:: READ T\$ :: PRINT #9:T\$ :
: NEXT X !073
29405 CLOSE #9 !159
29410 SUBEND !168

#### TRIALS OF A c99 BEGINNER

# **Complex arithmetic functions**

#### By CHARLES E. KIRKWOOD JR.

Complex arithmetic will be discussed this month — input, output, addition, subtraction, multiplication, and division.

A complex number in the form  $\mathbf{a} + \mathbf{bi}$  is composed of two components, a real part and an imaginary part. The components, a and  $\mathbf{bi}$ , may be plus or minus. The  $\mathbf{i}$  is generally used by the mathematician, while the engineer generally uses  $\mathbf{j}$  for imaginary; that is, the square root of -1. Remember that the square root of -1 squared is -1.

Adding two complex numbers, a+bi and c+di gives (a+b)+(c+d)i and subtracting gives (a-c)+(b-d)i. Multiplying is a little more involved. Algebraically, it is:

(ac-bd) + (bc+ad)i

Now, let us algebraically divide a+bi by c+di:

Five complex arithmetic functions are written and a sixth function, strcat(), renamed, catstr(), is included because it is used by one of the functions. The name change is made to prevent having two functions by the same name if the string library is also used in a program. A short program is also included to test the functions and show how the functions are used.

(See Page 22)

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tomb for treasure while
being chased by mummys.
BERLIN WALL (51) Excape from

E. Berlin and avoid mines.

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THE MIME (61) Fast action

and great graphics. Hours of excitment with this one: II RUNMER II (70) An all new upgrade of one of the best! CHESS (68) The famous game Zargon. Loade from exbasic.

Zargon. Loads from exbamic. CHECKERS & BACKGAMMOR (33) A collection of the best. SOLITAIRE & SCRABBLE (34)

A classic game collection!
WHEBL OF FORTUME, BLACKJACK &
JOKER POKER (2) Three of
the best we have seen. So
good you will expect Vana

sto appear:
STRIP POKER (13) When you win
she loses everything!
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professional quality action
games you are sure to like!

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notch graphics. Space game! SUPER TRIVIA 99 (4d) The best trivia games we have seen. Complete with questions!

R RATED GAME DEMO (26) The classic Space Invaders with "unusual" guns & targets. For Adults Only! TI-99 OLOPY' (12) Now you can

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ASTROFONY (54) Plots the heavens and teaches you about the solar system.

KIDS LEARNING VOL 2. (71) Still more great learning programs. We only included the very best!

#### MUSIC

THE SINGING TI-99/4A (1) A
2 mided collection of songs
where the computer actually
mings. By Ken Gilliland.
Requires meach syn.

TI MUSIC/GRAPHICS DEMO (5A)
A great collection of music
a matching graphics.

& matching graphics.
EXBASIC MUSIC DEMO (6) A 2eided collection of great
music with graphics. Hours
of enjoyment!

COMPUTER PLAYER PIABO/CHORD ABALYSIS (69) A piano on the screen playe your selections or write your own with instructions incl. Also a program to learn keyboard chord formation.

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#### **SPREADSHEETS**

SPREADSHEET DEMO (56) A complete spreadsheet program for learning and many applications. Easy to learn and use!

#### ACCOUNTING AND FINANCE

ACCOUNTS RECBIVABLE (20) A complete AR program with documentation. Won 1st prize in TI programming contest.

STRICTLY BUSIBESS (36) A 2disk side collection of programs for evaluating loans, interest, stocks etc.

#### DATABASE PROGRAMS

DATA BASE DEMO (21) A fully met up data base program designed for filing and finding magazine articles. Basy to use or modify for other applications. Sample data included!

PR BASE (58) This is a full feature DB freeware program that is rated as one of if not the best. Documentation included!

#### **GRAPHICS**

ABINATION 99' (52) This is the one by Ray Kazmer that was featured in the July 88 Micropendium. See fantastic animation and also learn how it was done. This one is destined to be a classic

ANIMATED XMAS CARD (1) This
is the original animation
by Ray Kazmer that made him
an overnight superstar in
the TI community. This
classic is also referred
to as "Woodstock" among

PRINTART DEMO (4) This 2-disk side collection prints well known comic and TV personalities out on your printer.

FIGURE STUDY (14) This is a collection of programs that print Playboy type center-folds out on your printer.

MONA LISA PRINTOUT (9) This program prints a near photo quality picture of Mona Lisa on your printer. You won't believe the quality!

won't believe the quality!
SPACE SHUTTLE DEMO (7) An
outstanding music/graphics
program that salutes the
U.S. space program. Its
almost like watching a film.
STAR/BPSOW DEMO (15) A 2-Disk

STAR-BPSON DRMO (15) A 2-Disk wide collection of programs to show you what your printer can really do. Also a great graphics tutorial with examples! GOTHIC PRINT DISK (10) This program lets you type a message and then prints it out in Old English style. Looks like hand lettered calligraphy. Great for invitations, announcements. SIDEWAYS PRINTOUT (16) Lets your printer print sideways Great for epreadsheets and banners. Includes two versions and new Multiplan enhancements.

VIDBO GRAPHS (41) This disk is sold as a backup to owners of the discontiued TI Video Graphs module. We can only legally provide it to module owners.

#### **TELECOMMUNICATIONS**

TELCO (57) This program has been rated as one of the best telecommunications programs for the TI-99/4A A user supported program that contains everything you need to upload and download data with your modem. Supporte all baud rates and protocalls.

#### **APPLICATIONS**

WILL WRITER (23) Enter your answers to a group of questions and this program writes out a complete will. MEDICAL ALERT (25) Contains

many menu accessable files on what to do until the doctor or paramedics come. Could easily save a life!

EBGIBERIEG CALCULATIONS (24) A 2-disk side collection dozens of engineering and technical formulas. Does calculations, convermions, and even designs electrical circuits. Even contains medical and communications data and formulas.

LABBL MAKER (29) A pair of programs that let you make quick and easy labels for all purposes. Mail, disks, files etc. Uses standard tractor labels and even makes a graphic picture with the label text.

IMFOCON RAPID LOADER (47) A must for owners of Infocom 99/4A games. Loads games in seconds instead of minutes. Basy to use!

GEFBALOGY (67) Now you can enter and arrange your family tree and print out copies for your relations. Also can be used if you breed animals such as dogs, cats or horses.

GRAPH MAKER (59) A collection of the best programs we have seen that produce graphs and charts from your data. Printer required!

HOUSEHOLD BUDGET PRINTOUT (3)
This program lets you
printout the data from the
TI Household Budget module,
an important feature that
TI forgot.

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SPREADSHEETS

GRAPHICS

UTILITIES

SECURITY/HACKING

APPLICATIONS

BARIC

#### **APPLICATIONS**

#### (continued)

HRBREW TYPEWRITER (66) This program converts your 99/4A from english to hebrew. A great tool for religious studies. Can be combined with a screen dump program to print out the text from the screen. A great way to learn how to do the same with other languages. To get you in the mood, we also included a music/ graphics program of "Fiddler" on this disk!
ARTIFICIAL INTELLIGENCE (40)

This disk includes the famous computer progam
"Eliza" where the computer responds to your problems and questions in a manner that is almost human. Save a bundle on what you would pay a shrink for the same services. Also includes one of the better biorhythm programs so you can really take control of your emotional problems at one sitting.

LOTTO SELECTOR (8) This program selects numbers for use in the various state lotto games and even rune a simulated lotto game Unprotected so it is easily modified for additional

ASTROLOGY (22) This program is as good as the coin operated machines. Tell it your birthday and see a great color display on your zodiac sign and see historical data on what took place in history on your birthday. Great for parties or even a charity event. Many famous people rely on this information!



#### TI PROGRAMS FROM AROUND THE WORLD

LAPD COOKBOOK' (37) A complete computer collection of great receipes compiled by great receipes compiled by an LA cop who is also a gourmet chef. Whenever he went to a top eating place he would hit the chef up for a receipe. 2 disk sides completely menu selectable.

ORIGINAL TI SALES DEMO (5) This disk given to TI dealers by TI back in 1986, includes demonstration programs with graphics, speech, PRK, TB-I, and even includes the famous game TI-TREK which we reprogrammed to run on the TE-II module inetead of the discontinued Speech Editor.

#### UTILITIES

HACKER CRACKER (53) A collection of the top disk copy programs including the best of the track copiers. One or more of these programs will copy almost programs will copy almost all protected disks. Both T1 & CorComp compatible programs are included. 2 disk drives are required on most of these programs. SCREEN DUMP (55) This program

allows you to printout what you see on the screen while running a disk, cassette or module program. Instructions included. Requires a Star or Epson compatible printer

DUMPIT (3) This disk lets you copy a number of TI modules to disk. Editor Assembler module and Vidget (cartridge expander) recommended for best results Some programming knowledge will be helpful!

TI DIAGROSTICS (19) This program released by Ti loads into the Ti Mini Memory module and then lets you test your system. Better than diagnostics on a disk wince if your disk system was not working properly, you would not be able to use it. Complete with all documentation on a second disk side

DISK KAHAGER II (62) This is the TI Disk Manager I module on disk. Now if your module goes, you are protected. Sold as a backup to owners of the module

Loads with exbasic. LOADERS & CATALOGERS (28) A collection of the best catalog and menu/loader programs we have seen programs we have ween.
Ready to be put on your
own program dieks.
PROGRAMNIEG AIDS & UTILITIES

(35) This disk contains a collection of handy files including a group of title displays and a super cross reference program. Also included is a great disk management utility that you will use over and over!

TI WRITER/BULTIPLAN UPGRADE (19) This disk released by Il addm real lower case to your II writer and more Also speeds up Multiplan. TI FORTH DEMO (17) This disk

released by TI demonstrates the power of the programming language Forth for music and graphics. Requires 32K and Editor Assembler Module FUBBELVEB PARK UTILITY (42)

This program from down under puts many of the most often used application and utility programs at your fingertips. Complete with documentation on two disk sides.

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172. CERBERÚS

Fantastic space game from Germany Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music. #74. LABEL MAKER II

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

#75. DISK CATALOGER

Now you can organaize 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 sreen 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.

#### SERIES VII

#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 MAX-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 based on 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

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RAY RAXMEN has created a great maze game with fantastics 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 origrinall sold for \$59.95. Keeps track of household, business or percent items by catagory and provides

sonal items by catagory and provides automatic updating for inflation etc. A must for tax and insurance records!

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This powerful utility lets you explore the entire memory in your

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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.

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This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of othe great tricks in exhasic. 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.
#103 SORGAN, THE 99/4A ORGAN
This program which is currenly selling for big bucks on module turns your 99/4A into a elect-ronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all. (E/A) #104 C99 COMPLILER 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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Unbeliveable collection of fantastic aids to make the best even better! 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 (

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#111 POP MUSIC & GRAPHICS

#III FOR MUSIC & GRAFINGS
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astound you! (E/A)
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An excellent invoice preparation and printing program with instructions on how to modify it for your own business. #112 LABEL MAKER 3

A collection of label programs to create mailing and disk envelopes, disk labels and much more!

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A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist! #115 GRAPHICS DESIGN SYSTEM

A complete system for creating graphic screens in full color your programs by J. Peter Hoddie. Fully documented. #116 FOURTH TUTORIAL

A lesson in FORTH programming on how to create graphics

#117 UNIVERSAL DISASSEMBLER #II/ 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. (E/A)

#118 FAST TERM One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASCII, and X-Modem transfers, print spooling and more.

#119 RAG LINKER A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster



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#### (Continued from Page 17)

Briefly, the complex number in the form  $\mathbf{a} + \mathbf{bi}$  is read into a string. The variables  $\mathbf{a}$  and  $\mathbf{b}$  are then separated into two floating-point variables. The desired arithmetic is performed. The resulting real component and imaginary components are converted to strings and concatinated to one string for output or other operations.

In order to simplify the operations and use fewer variable names, an array is used to store the real and imaginary components. The arrays  $\mathbf{x}$  and  $\mathbf{y}$  are input arrays and the result is  $\mathbf{z}$ . The real component is stored into the zeroth element and the imaginary component (less  $\mathbf{i}$ ) into the first element. Remember a floating-point number occupies 8 bytes, so actually the two components are in a two-dimensional array.

The following declarations should be made:

```
float x[2][8],y[2][8],z[2][8];
char s[30];
int oper:
```

In writing the program and functions, we need to be concerned with the first dimension only of x, y, and z, for the second one never changes. Using  $\boldsymbol{w}$  to represent any two-dimensional array for the two components and  $\boldsymbol{oper}$  to represent the operation, the five functions are:

```
fgetcx(s,w)
                        inputs a complex number in the
                        form, a+bi.
fsepxn(s,w)
                        separates the complex number into
                        its real and its imaginary
                        components.
fcmplx(x,oper,y,z)
                        adds, aubtracts, multiplies, or
                        divides the separated components.
fcbncx(w,s)
                        combines the two components back
                        into its complex form a+bi.
fputcx(w,s)
                        outputs the complex number.
          /*Example program to test the functions.*/
         #include DSK1.FLOATI
         main()
            char s[30];
            float x[2][8],y[2][8],z[2][8];
            int oper;
            puts("Release alpha lock.\n\n");
            puts("Enter first complex number*/;
            puts(" in the form a+bi\n");
            fgetch(s,x);
            puts("\nEnter second complex number:\n");
            fgetcx(s.v):
            puts("\nEnter operation:\n");
            oper=getchar();
            putchar(10);
            outchar(10):
            fcmpIx(x,oper,y,z);
            fputcx(z,s);
            putchar(10);
            putchar(10);
```

```
fcmplx(a.oper.b.c)
 float a[][8].b[][8].c[][8];
 int oper:
   float a0b0[8],a1b1[8],a0b1[8],a1b0[8];
   float b0b0[8],b1b1[8],b0b1[8];
   if(oper=='+')
      fexp(&a[0][0],"+",&b[0][0],&c[0][0]);
      fexp(&a[1][0],"+",&b[1][0],&c[1][0]);
      return:
   else if(oper=='-')
     fexp(&a[0][0],"-",&b[0][0],&c[0][0]);
fexp(&a[1][0],"-",&b[1][0],&c[1][0]);
     return:
  else
    fexp(&a[0][0],"*",&b[0][0],a0b0);
    fexp(&a[1][0],"*",&b[1][0],a1b1);
    fexp(&a[0][0],"*",&b[1][0],a0b1);
fexp(&a[1][0],"*",&b[0][0],a1b0);
    fexp(&b[0][0],"*",&b[0][0],b0b0):
    fexp(&b[1][0],"*",&b[1][0],b1b1);
    if(oper=='*')
      fexp(a0b0,"-",a1b1,&c[0][0]);
fexp(a1b0,"+",a0b1,&c[1][0]);
      return:
    }
    else
      fexp(b0b0,"+",b1b1,b0b1);
       fexp(a0b0,"+",a1b1,&c[0][0]);
       fexp(&c[0][0],"/",b0b1,&c[0][0]);
       fexp(a1b0,"-",a0b1,&c[1][0]);
       fexp(&c[1][0],"/",b0b1,&c[1][0]);
      return:
}
/*Input a complex number*/
fgetcx(s,x)
char s[];
float x[][8];
  gets(s);
  fsepcx(s,x);
  return;
```

```
(Continued from Page 22)
/*Output a complex number*/
fputcx(x,s)
char s[]:
float x[][8];
  fcbncx(x,s);
  puts(s):
  return:
}
/*Separate a+bi into two variables, a and b*/
fsepcx(s.x)
char sil:
float x[][8];
  char r[15], im[15];
  int i.j.k:
  i=0:
  j=0:
  while((s[i]!='+')&(s[i]!='-'))
    r[j]=s[i];
    ++i:
     ++j;
  r[j]=0:
  k=0:
  while(s[i]!='i')
     im[k]=s[i];
     ++i:
     ++k;
  im[k]=0;
  stof(r,&x[0][0]):
  stof(im,&x[1][0]);
  return:
}
/*Combine a and b to form a+bi*/
fcbncx(x.s)
float x[][8];
char s[];
  char t[15];
```

```
int i:
 ftos(&x[0][0],s,0,0,0);
 ftos(&x[1][0],t,0,0,0);
 catstr(s,t);
 i=1:
 while(s[i]!=0)
    if(s[i]==' ')
      s[i]='+';
    ++ i:
  s[i]='i':
  s[i+1]=0;
  return:
/*Concatinate two strings*/
catstr(s.t)
char s[],t[];
  int i,j;
  i=0:
  i=0:
  while(s[i]!=0)
    i++:
  while((s[i++]=t[j++])!=0)
  return:
}
```

Note that array arithmetic was used, pointers could have been used instead. Since these are floating-point functions, you might want to add them to Tom Bentley's library. Add catstr() also, since it is used by one of the functions. The following should also be added to FLOATI between #asm and #endasm:

#### REF FGETCX,FPUTCX,FSEPCX,FCBNCX,FCMPLX

The library can now be recompiled and reassembled so that it can be included during the link stage.

When is it that the right hand does not know what the left hand is doing, or vice-versa? There could be many answers to this question, but the one that strikes home is when the left hand types 4 when the right hand should have typed 8. Floating-point variables use 8 bytes, not 4 as stated in the February c99 article.

For those of you who have both a Horizon RAMdisk and a Cor-Comp disk controller, the normal DSK1 can be accessed by using dsk1 (TI Forum, The Computer Shopper).

#### LOADERS, MODULAR PROGRAMS, LINKAGES & OVERLAYS

# Modular programs using the E/A system

By MERLE VOGT

This is the second of a five-part series on loaders, linkages and overlays.—Ed.

In this installment I will go into modular programming and linkages.

It is clear that some very large programs

have been created for the 99/4A. Consider "Legends," by Donn Granros. It far ex-(See Page 24)

#### LOADERS, MODULAR PROGRAMMING, LINKAGES & OVERLAYS

#### (Continued from Page 23)

ceeds the RAM capacity of the 4A. So it is clear that it took modular programming to make this work.

Warning: It also required overlays, but I will get into that subject in part 4 of this series.

So, we break a large job into a number of smaller parts. Called modules, each has certain tasks to perform but is small enough to program without excessive effort.

Let's examine some procedures. I will create code for a main module - sometimes called driver - and two submodules. Nothing exotic, just short routines to illustrate principles without obscuring learning.

The main module is the master controller. There is a fragmentary example on page 413 of the Editor/Assembler manual. The key elements in this are the REFs and DEFs. Carefully study to understand how they tie together.

DEF means DEFine. In this command you name (DEFine) all the data items in this code block. which will be used in other modules, plus the name of the module. See this example:

#### DEF MAIN

"MAIN" is the name given to the module. The DEF is the first line of the code. It defines "symbols," each of which will have a RAM address in your code. (See Fig. 1) Note that lines 2 and 3 have a number of REF entries.

In MAIN we have DEFined only the module name.

The REFerence has a long list of symbols which are used in this module and are defined elsewhere. If any name is omitted from REF but is used in an instruction, then there will be a symbol hole in the code that the loader cannot resolve and you bomb out. We have REF'd to a utility — VMBW. The rest of the REF names will be defined in the two subroutines — ENTER1 and ENTER2. REF'd symbols appear in lines 13, 13, 16, 18, 19, 20, 21, 26, 27 and 28. At assembly time all these create holes (=0000) in the code. The loader fills these by tracking the REFs back to the matching DEFs. If you REF a symbol and don't have a DEF for it, the loader cannot work.

In the Editor/Assembler, initialization places a REF/DEF table in low RAM at addresses < 3F38 through <3FFF. The DEFs that you create are placed into addresses <3F30, <3F28, <3F20, <3F18, etc., downwards, as required. This is where you look if debugging is necessary.

See Fig. 2 for the code for the subroutine ENTER1. Note the DEF and REF lines. See Fig. 3 for the subroutine ENTER2. Note the use of both

(See Page 25)

1 2 3 4 5 6 7 8 9 10 11 12	FIN ALL MYWS MAIN EJ M2	DEF REF REF DATA TEXT BSS STWP MOV B LWP! B LWP! CLR	MAIN ENTER1,ENTER2,DATA1,MESSQ WAIT4,VMBW,SCROL,SCROL2 10 'THAT IS ALL - HIT A KEY 32 R12 R12,@EJ+2 @M2 0 *R11 MYWS
14	LOP1	BL	@ENTER1
15 16 17 18		LI LI LI BLWP	R0,>200 R1,MESSG2 R2,16 @VMBW
19		BL	@SCROL
20		BL	@ENTER2
21 22		C JL	@DATA1,@FIN LOP1
23 24 25 26		LI LI LI BLWP	R0,>200 R1,ALL R2,24 @VMBW
27		BL	@SCROL2
28		BL	@WAIT4
29		В	<b>@</b> EJ
30 Fig. 1 -	– Main	END	

#### Fig. 1 — Main

Line 28

#### COMMENTS

Fig. 4(

Line 1	defines the name of this module - MAIN
Lines 2-3	specify all of the REF symbols used in MAIN
Lines 4-6	set up data, text and work space
Lines 7-11	set up the start and end routines
Line 12	assigns main workspace
Line 13	zeroes a counter — DATA1
Line 14	displays the text of MESSGI by executing module ENTERI
Lines 15-18	displays MESSG2 text
Line 19	uses a GROM scroll routine from ENTER1 (see lines 115-117,
Line 20	branches to execute module ENTER2
Lines 21-22	tests to see if we are done yet
Lines 23-26	displays the end of job message on screen
Line 27	uses a GROM scroll routine from ENTER2

executes a keypress wait routine (see lines 215-220) Line 29 branches to the exit routine

#### LOADERS, MODULE PROGRAMS, LINKAGES & OVERLAYS

#### (Continued from Page 24)

REF and DEF.

These subroutine examples are not fabulous code. Examine the REFs and DEFs carefully. Note how they balance out. Most everything on line 2 in MAIN comes from lines 101 in ENTER1 and 201 in ENTER2. REF DATA1 on line 202 comes. from line 101. VMBW and KSCAN come from the system.

Proceeding from here, the next step is to call up the Editor/Assembler editor and create the three source modules and save each to disk. Here are some sample names you may use:

DSK1.MAINSRCE

DSK1.ENTERISRCE

DSK1.ENTER2SRCE

Then invoke the assembler and make object modules for each of the three source modules, saving each to disk. Also, get three listings one the printer. Object module filenames could be:

DSK1.MAINOBJT

DKSI.ENTERIOBJT

DSK1.ENTER2OBJT

The next step is to invoke Load and Run, option 3 from the Editor/Assembler main menu screen. At the filename prompt, enter the object file names, one after the other to load all three modules. Then hit enter without entering a filename to proceed to the program name prompt.

Before we actuall proceed, there is a big pit waiting for us to fall into. It made no difference in which order you created the source modules with the editor. Nor did it matter what order you assembled them in. But, at Load and Run time, look out! Examine the table below:

ENTERI	DEF REF	ENTERI,DATAI,SCROL2,SCROL VMBW,GPLLNK
ENTER2	DEF REF	ENTER2,MESSG2,WAIT4 DATA1,KSCAN,VMBW,SCROL2
MAIN	DEF REF REF	MAIN ENTERI,ENTER2,DATAI,MESSG2 WAIT4,VMBW,SCROL,SCROL2

You must load the object modules in the sequence shown, no other way. Look at ENTER2 — it REFs to four names, so you must load module ENTERIOBJT first so that a DEF entry is made into the REF/DEF table for all those symbols needed in module ENTER2.

Only then can you load the ENTER2OBJT module. The loader can then resolve the symbol DATA1 that you coded in line 206 of ENTER2. While loading ENTER2, the DEFs of ENTER2, MESSG2 and WAIT4 are put into the REF/DEF table.

Now you can load module MAINOBJT. The loader can now resolve the REFs to symbols (See Page 26)

	101		DEF	ENTER1,DATA1,SCROL,SCROL2
	102		REF	VMBW,GPLLNK
-	103	DATA1	DATA	0
1	104	MESSG1	TEXT	'   AM FROM ENTER1'
Ì	105	ENTER 1	INC	@DATA1
ļ	106		MOV	R11.R9
	107		LI	RO,>200
	108		LI	R1,MESSG1
	109		LI	R2,16
Į	110		BLWP	@VMBW
	111		BL.	@SCROL
ı	112		В	*R9
	112	CODO: 0	D1 1450	0001 ( ) 114
Ì	113	SCROL2	BLWP	@GPLLNK
	114		DATA	>4D00
ı	115	SCROL	BLWP	@GPLLNK
ı	116		DATA	>4D00
i	117		В	*R11
ı	118		END	

#### Fig. 2 — ENTER1

#### COMMENTS

Line 101	DEFs the module name, a data item name, and two entry point names
Line 102	REFs names we need here
Lines 103-104	data and text items
Lines 105-106	adds 1 to the counter, and saves REG 11
Lines 107-110	displays MESSGI
Line III	scroll one line up
Line 112	returns to caller
Lines 113-116	use GPLLNK to execute a line scroll routine in GROM #2, and exit
Line 117	exits this subroutine

201 202 203 204 205 206 207 208 209 210 211 212	MESSG2 WAIT2 STAT ENTER2	DEF REF TEXT TEXT TEXT EQU INC MOV LI LI LI BLWP BL	ENTER2, MESSG2, WAIT4 DATA1, KSCAN, VMBW, SCROL2 'I AM FROM ENTER2" 'READ MESSAGE - THEN HIT A KEY " >837C @DATA1 R11,R9 R0,>200 R1,WAIT2 R2,28 @VMBW @SCROL2
214		BL. B	@WAIT4 *R9
245			
215	WAIT4	CLR	@STAT
216		BLWP	@KSCAN
217		CB	@STAT,@STAT
218		JNE	WAIT4
219		CLR	@STAT
220		В	*R11
221		END	

#### ENTER2

rig. 5 — Elv	COMMENTS	
Line 201	DEFs module name, a text item name, and an entry point name	
Line 202	REFs DATA1, KSCAN, VMBW and SCROL2, all used in this module	
Lines 203-205	creates two text items, and an equate needed	
Line 206	adds I to counter DATAI, located in module ENTERI	
Line 207	saves a return address in register 9 (see line 214)	
Lines 208-211	displays the message WAIT2	
Line 212	executes a two-line scroll	
Line 213	transfers to keypress wait routine. Read messages, hit a key to proceed	
Line 214	exits routine	
Lines 215-220	keypress wait routine to allow you to read screen messages	

#### LOADERS MODULAR PROGRAMS, LINKAGES & OVERLAYS

(Continued from Page 25)

ENTER1, ENTER2, DATA1, MESSG2, WAIT4, VMBW, SCROL and SCROL2 as they are found in the main module.

The resulting REF/DEF table should look like this, going downwards from address < 3F20:

	TABLE	DEF	TRUE
	ADDRESS	NAME	ADDRESS
(ENTERI)	> 3F30	<b>ENTER1</b>	>XXXX
	> 3F28	DATA1	>XXXX
	> 3F20	SCROL2	XXXX
	> 3F18	SCROL	> XXXX
(ENTER2)	>3F10	ENTER2	>XXXX
	>3F08	MESSG2	> XXXX
	>3F00	WAIT4	
(MAIN)	>3EF8	MAIN	>XXXX

The DEFs of VMBW and KSCAN were already in the table. I hope I have made this procedure clear.

Note that all of the *end* lines on all modules are "blank" END,S. Auto-start is invoked by having a module entry point name symbol on an *end* line. Here you could have coded "END MAIN." But, as shown, you must proceed to the *run* prompt and type MAIN then press the enter key to start executing. At the conclusion of the program, exit is made back to the Editor/Assembler. The screen is cleared, your message disappears and the message "Press enter

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to continue" is displayed. This is why the "Key press wait" rout was included. Without that all you would see is some blinkst the screen and be back into the E/A system.

Let me make an important note. As shown, all three moduluse the same workspace, which is allocated in MAIN. For lap modules it would be much better to give each module its or workspace. This is easy as instructions to do this are provide See below for changes to accomplish this.

		1		
A. in modu	ıle MAIN cha	nge:		
line 14	BLWP	@ENTER1		
line 20	BLWP	@ENTER2		
B. in modu	ile ENTER1 c	hange:		
line 104B	WS1	BSS	32	
line 104C	<b>ENTER1</b>	DATA	WS1	
line 104D		DATA	ENT1	
line 105	ENT1	INC	@DATA1	
line 106	( delete )			
line 112		RTWP		
C. in modu	ile ENTER2 c	hange:		
line 205B	WS2	BSS	32	
line 205C	ENTER2	DATA	WS2	
line 205D		DATA	ENT2	
line 206	ENT2	INC	@DATA1	
line 207	( delete )			
line 214		RTWP		

If you have been carefully checking the changes, you should have noted that in lines 19, 27, 28 and 212 the "BL" instruction has been retained. We can do this because the routines SCROL2, SCRO and WAIT4 are in a sense "sexless" in that they do not care which workspace is active when they execute.

I hope I have explained in enough detail and that I have clarifit some of this stuff for you. I will be first to admit that it is tedion work. But do not assume that the 99/4A system is imposing pointless effort upon you. We had to grind through all the exast same steps to build and run programs on the IBM 360/370 computers. I do not know if they have made it easier now in the Pi machines. However, I am happily clear of that mess.

The little examples in ENTER1, ENTER2 and MAIN are mexotic programming. In real work the modules are normally large because we are breaking up some monster into more manageable chunks. But be cautious. Do not let them get so big that you lost control at that level.

Next month's installment is titled Dynamic modular program ming using Extended BASIC.—Ed.

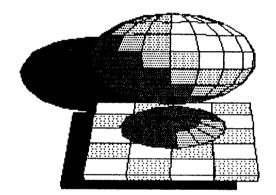
#### READER TO READER

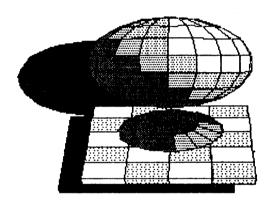
Bill Buchanan, Il South Alabama Rd., Lehigh Acres, FL 339% would like fellow users in that are o write him, in order to for an informal users group.

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#### MICROpendium Index 1988 — Part 2

# Index includes new, faster sort routine

This is the second installment of the MICROpendium Index for 1988. The first installment was published last month. The index is maintained by Elton Schooling, of Sacramento, California.

A major change in this version is the addition of a fast sort routine that is CALLed in line 130. Of course, this routine requires a memory expansion. Those without a memory expansion should continue to use the sort routine included with previous installments of the MICROpendium Index.

There are 178 DATA entries in this portion of the 1988 index. Last month's index listing included 188 DATA statements.

Readers who discover errors in the DATA statements are encouraged to provide corrections so that we may pass them along to others.

#### **MPINDEX-88B**

10 REM INDEX88B MICROpendium INDEX for 1988, July to Dec ember. Publisher John Koloe n, editor Laura Burns. !038 20 REM Compiled by Elton Sch ooling, 4014 57th St., Sacra mento, CA 95820 !173 30 REM Sort routine by David Romer and John Clulow. Ob-t ained from the Boston Comput er Soc., T199/4A User Group. The '88 index is !218 35 REM divided into 1988A, J an to Jun, and 1988B, July to Dec. !069 40 REM For your printer you may need to change line 160. !202 50 REM For longer dwell time on screen increase the DELA Y number in line 330. !210 52 CALL INIT !157 54 CALL CLEAR ! 209 55 PRINT: "LOADING SORT ROUT INE" !216 56 CALL LOAD("DSK1.SORT")!07 60 OPTION BASE 1 !137 70 CALL CLEAR !209 80 DIM N\$(178)!212

90 INPUT "OUTPUT TO PRINTER?

(Y/N)":P\$ !247 100 CALL CLEAR !209 110 PRINT "WORKING" !139 120 FOR |=1 TO 178 :: READ N \$(1):: NEXT | !075 130 CALL LINK("SORT", N\$(), 17 8)!199 140 CALL CLEAR !209 150 IF P\$="Y" THEN 160 ELSE 290 !093 160 OPEN #1:"PIO" !253 170 PRINT #1:TAB(24); "MICROP endium INDEX, 1988B" !225 180 PRINT #1: : : : ! 103 190 FOR J=1 TO 178 :: IF J=1 05 THEN 200 ELSE 220 !128 200 PRINT #1: : : :: PRINT #1:TAB(35);"PAGE 16" :: PRI NT #1: : : : : : : : : : GOTO 220 !198 210 PRINT #1: : : : :: PRI NT #1:TAB(31); "PAGE 15, INDE X '88" :: PRINT #1: : : : : ::::::079 220 IF J/2=INT(J/2)THEN 240 230 PRINT #1:N\$(J);:: GOTO 2 50 ! 240 240 PRINT #1:TAB(40);N\$(J)!1 88 250 NEXT J !224 280 GOTO 360 !184 290 CALL CLEAR !209 300 CALL SOUND (500, 110, 0, 131 .0.196.0)!005 310 PRINT TAB(7); "MICROpendi um INDEX, 1988B" :: PRINT : ::!066 320 PRINT "DATE AND PAGE NO. ARE LISTED TOGETHER. JAN 85 p.16 BECOMES 1/85/16.": :: 1005 330 FOR J=1 TO 178 :: PRINT N\$(J):: FOR DELAY=1 TO 200 : : NEXT DELAY :: NEXT J !029 340 PRINT : :!006 350 PRINT "DATE AND PAGE NO. ARE LISTED TOGETHER. JAN 85 p.16 BECOMES 1/85/16." :: G OTO 390 !062 360 PRINT #1: : :!178 370 PRINT #1: "DATE AND PAGE NO. ARE LISTED TOGETHER. JAN

85 p.16 BECOMES 1/85/16."! 146 375 PRINT #1: : : : : : : : :: PRINT #1:TAB(23); "MIC ROpendium Index, 1988B, Page 17" !225 380 CLOSE #1 !151 390 END !139 400 DATA TIFORTH GRAPHICS2 F IX FEEDBACK 7/88/8, BAS A-B-C 'S 7/88/10.DEMYSTIFYING ASSE MBLY 7/88/14 !206 410 DATA A-B-C'S BAS 7/88/10 ,ASSEMBLY DEMYSTIFYING 7/88/ 14. GRAPHICS2 TIFORTH FIX FEE DBACK 7/88/8 !206 420 DATA GENEVE COPIERS 7/88 /21,ANIMATION (2 ART) 7/88/2 7, ARTIST ENLARGER REV 7/88/3 2, ENLARGER ARTIST 7/88/32 !0 43 430 DATA DAY OF WEEK ROUTINE USNO 7/88/36.XB PROGRAMS FA STER 7/88/36.FASTER XB CODIN G USNO 7/88/36 !158 440 DATA C99 CALENDAR MOD/TY POS USNO 7/88/37, CALENDAR C9 9 MOD/TYPOS USNO 7/88/37, LEA DING ZEROS COUNTER USNO 7/88: /37 !054 450 DATA COUNTER LEADING ZER OS USNO 7/88/37, EZ KEYS TIPS USNO 7/88/37, TINYSONAR USNO 7/88/38 !136 460 DATA ZEROSLASH MULTIPLAN USNO 7/88/38, MULTIPLAN ZERO SLASH USNO 7/88/38 !034 470 DATA BAS BASICS OF BASIC 8/88/10,ASSEMBL PERIPHERAL DEVICES 8/88/12.ACCESSING PE RIPHERAL DEVICES 8/88/12 !03 480 DATA C99 MATH FUNCTION L IBRARY 8/88/19, MATH FUNCTION LIBRARY C99 8/88/19, WIPE-OU T GAME 8/88/24 !092 490 DATA 9918A TI VIDEO CHIP S 8/88/29, TI VIDEO CHIPS 991 8A 8/88/29, GENEVE MYARC'S AL CONNECTION 8/88/36 !249 500 DATA GRAMULATOR REV 8/88 /40,BARRAGE GAME REV 8/88/42 (See Page 30)

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510 DATA XBASIC HELP EDITOR

AID USNO 8/88/44.POKEV SUPER

EDITOR AID XBASIC HELP USNO

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USNO 12/88/45, GENIE CORRECTI ON USNO 12/88/46 1096

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No of cots
No. of sets Amount \$
Name
Address
City
State ZIP
CREDIT CARDS ORDERS  Circle card used (minimum order \$9)
Card No
Expiration Date
Signature

## Sort routine for MICROpendium Index

A0000A07D0A08D0A09D0A0AD0A0AF0B0000B0001BFF00BC80B7F2ADF 00CA0 0001 A0AF8C0AF0B02E0C0AD0B04C0B0201B0002B0420B200CB0200B4041B90207F2D1F 0002 A0B0EB834AB1316B06C0B9020B834AB1304B0200B1300B0420B2034B02027F2FBF 0003 A0B24B0064B04C3B04C4BD0E0B834BB06C3B38C2B04C3BD0E0B834CB06C37F254F 0004 A0B3ABA103B1004B04C4BD120B834BB06C4B04CAB04C9BC820C0AF2C00027F270F 0005 A0B50BC804C0004B058AB028AB0000B1602B0460C0C58B060ABC24AB0A197F2AEF 0006 A0B66BC049B0A11BC321C0002BC361C0004BC00CB0201B0001B0202C07D07F2D9F 0007 A0B7CBD820C0AF4C07D0B0420B2014BC3CCBC38DB058EB060EB83CEB133A7F21DF 8000 A0B92BC00EB0201B0001B0202C08D0BD820C0AF4C08D0B0420B2014B02017F2D1F 0009 A0BA8C07D0B0202C08D0B06A0C0C68B0280B0001B1301B10E9BC00FB02017F2B6F 0010 A0BBEB0001B0202C08D0B0420B2010B058FB83CEB131CBC00FB0201B00017F2B3F 0011 A0BD4B0202C09D0BD820C0AF4C09D0B0420B2014B0201C07D0B0202C09D07F2B0F 0012 A0BEAB06A0C0C68B0280B0002B1301B10E9BC00EB0201B0001B0202C09D07F2C3F 0013 A0C00B0420B2010B10C3BC00FB0201B0001B0202C07D0B0420B2010BC04D7F2FEF 0014 A0C16B604FB0281B0002B110BBC24AB0A19BC04FB0581BC089B0A12BC8817F27BF 0015 A0C2CC0002BC88DC0004B058ABC04EB604CB0281B0002B110BBC24AB0A197F27EF 0016 A0C42BC089B0A12BC88CC0002BC04EB0601BC881C0004B058AB0460C0B567F286F 0017 A0C58B04C0BC800B837CB02E0B83E0BC2E0C0AF0B045BB04C3BD0D1BC0027F23FF 0018 A0C6EB9452B1401BD0D2B06C3B0581B0582B9452B1A0BB1B0DB0603B15F97F27AF 0019 A0C84BC080B9812C07D0B1A04B1B06B0200B0003B045BB0200B0001B045B7F2DBF 0020 A0C9AB0200B0002B045B7FB76F 0021 50AF6SORT 7FD1FF 0022 99/4 AS 0023

This sort routine may be entered on a word processor or through Editor/Assembler. Enter it exactly as it appears. If even a single character is mis-typed an error message will be generated when it is CALLed from the index program.

If entered on a word processor and saved as a D/V80 file,

it must be loaded into the Editor/Assembler editor and then saved as a D/F80 file. If entered on the E/A editor, save it as a D/F80 file.

This routine was written by John Clulow and David Romer several years ago.

#### **GENEVE**

# XDIR does directories exceedingly well

Have you ever wanted to run a directory of all DV 80 files on a floppy or hard disk, have it listed 21 lines at a time on the screen and output it simultaneously to a printer?

With XDIR by John Johnson you can do just that. And more, or less, depending on what you want.

XDIR is an extended MDOS utility written in assembly language program that allows you to gain more control over directory operations than is possible with current versions of MDOS. It is thoroughly commented, and runs from the MDOS prompt.

Because of its length — more than 850 lines — we are able to publish only about half of it this month. The remainder will appear next month. Readers will find that most MDOS source code is very long compared to most assembly language programs written for the TI. We hope that no one will feel inconvenienced by having to wait until next month to finish the program.

XDIR is invoked by typing XDIR at the MDOS prompt (it must be located in the disk drive specified by the prompt). Here are the optional arguments that can be used with XDIR:

#### XDIR [path][afn/ufn]['filetype][/pmsc?]

Afn stands for ambiguous filename and ufn represents unambiguous filename. An example of an ambiguous filename is: TEST??, with the question marks representing the last two characters in the seven-character filename. In addition to a question mark, an asterisk may also be used with afn, for example: TE\*. This would result in any filename whose first two letters are TE to be included in the directory (of course, only one asterisk may be used in an afn. An unambigous filename (ufn) is one that uses no wild-card question marks or asterisks.

Type refers to the file type. They are:

FILE TYPE	SWITCH
Display/Fixed file	,D
Display/Variable file	'd
Internal/Fixed file	'I
Internal/Variable file	ʻi
Program image file	'P
Subdirectory	· 'S

File types are specified by using the appropriate *switch*. Here is an example of how to run a directory of a disk in floppy drive A, the drive on which XDIR is placed, of all Display Variable files: XDIR 'd

To run a directory of all Display Variable files on a particular subdirectory on a hard disk, use this syntax:

#### XDIR C: \LETTERS'd

Beyond these file switches, which are supported by MDOS V. 1.14, XDIR supports several options, including:

OPTION	FUNCTION
/ <b>M</b>	More
/ <b>P</b>	Print
/ <b>S</b>	Single directory
/C	Confirm
/?	Reminder of correct command
	syntax

Let's suppose you want to view the root directory one screen

at a time, output it simultaneously to a printer. Here is how the switches would be used:

#### XDIR /PM

Briefly, here is what the options do:

/P — outputs to screen. Can be stopped by pressing the P key. /M — pauses directory after 21 lines are scrolled. Can be stopped by pressing M.

/S — reads the specified directory but not it's subdirectories.

/C — prompts for confirmation of operation (no point in using it with XDIR but has applications with other extended utilities such as XDEL (planned for publication in future)

/? — brings up a description of the command syntax you are using

Pressing CTRL X will skip the next subdirectory when examining more than one directory.

The code follows. Use a word processor or the Editor/Assembler to input it.

#### **XDIR**

```
Title:
Author:
                           XDIR ||
John A. Johnson
                           22 February 1989
                   Date:
         Description: does an involved directory of a drive
          FQU
                 >FØØØ
                                    my workspace
 UTILWS EQU
                 WS+32
                                    another ws for routines
just a buffer for parsing etc
WORK
                 )F142
           EOU
                 13
                                    a carrage return
           FQU
           DXOP CALL, Ø
                                    define CALL as meaning XOP #
                                    use a fast workspace
          LI R#,1
LI R1,7
LI R2,1
SETO R3
                                    get memory pages
                                      need a new computer to store directory names
                                   local page 1 if you got it, flaunt it request the ram from mdos
          CALL OMEM
ABS RO
                                    check for errors
                GOTMEM
                                    if none
                 @TTYOUT
                                   else paint message
          DATA NOMEM, $
                                     not enough memory
                 GNOPPN3
                                   then exit to mdos
GOTMEM LI
                                   get address man
                 R1, MAP
R2, 10
                                   execution address of man
                                        is 10 bytes big
          CALL @MEM
L! R1,MAP+1
MOVB *R1+.@>F1
                                   get the info from mdos
now bank in the new ram pages
new ram for >2800 - >3FFF
new ram for >4000 - >7FFF
new ram for >8000 - >8FFF
          MOV *R1+,@>F112
          MOV
                                          new ram for >COOR - >FFFF
         CLR
CLR
                @PRINT
@MORE
                @SINGLE
          SB
                OTYPES, OTYPES
OTYPE, OTYPE
          SB
                 RØ.>2800
                                         40 bytes for WORK length patch it
          MOVB RØ. *R1+
                                          crunch command line and move it to WORK
                                         get command line and move it to
get command line argument address
if no arguments
see if command line is too long
if too long
                @>#128,R2
          MOV
                NOGOT
                 @2(R2),@-1(R1)
         JHE
                R1,R5
                                          else save address of WORK to R5
                                          to length pointer
         MOVB #2(R2),R6
SRL R6,8
INCT R6
                                          argument length
                                          make it a word
                                          add two
NXTNOD MOV
                                          save command address
          INCT R3
                                          add 2
                                        (See Page 34)
```

#### XDIR---

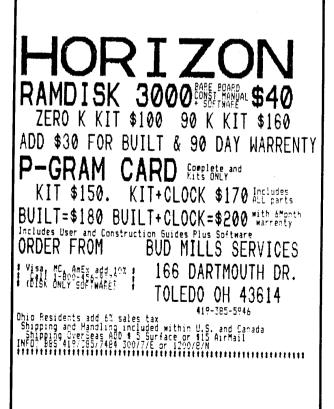
```
(Continued from Page 33)
                                                                                                                     JNF
                                                                                                                          ENDOOT
                                                                                                           GOTDOT CI
                                                                                                                          R2,16
                                                                                                                                              is filename too big?
          MOV R2.R4
                                                                                                                     JLE
                                                                                                                                             yes, exit to mdos
patch name length to show path only
do we have anything?
if not, no search involved
                                                                                                                           @EXIT
GETNOD MOVB *R3+, *R5+
                                          start moving the data till count is done
                                                                                                                          R1,@LEN
R2,@STLEN
                                                                                                                    MOV
                                                                                                           OK! FN
          DEC R6
                                                                                                                    MOV
               GOTCMD
          JEQ
                                                                                                                     JFO
                                                                                                                          NOSRCH
                 R3.R4
                                          r3 holds node count if done this node, go get some more
                 GETNOD
                                                                                                          * r2 contains the byte count of the string to search for * r1 contains the offset of the string from FNAME
          MOV #R2.R2
          JMP
                NXTNOD
                                                                                                                           RØ, STRING
GOTCMD MOVB @WORK-1.R1
                                   length of argument
                                                                                                                                                    save length of string
Put filename in string buffer
                                                                                                                     MOV
                                                                                                                          R2 R4
           JEQ NOGOT
                                    if no arg
                                                                                                           GETST
                                                                                                                    MOVB @FNAME(R1),*RØ+
                R1,8
                                   else make it a word
and add 1 for the loop conter
          SRI
          INC
                                                                                                                    DEC
                 R2.50
                                   largest argument possible
          LI
                                                                                                                     JNE GETST
                 R4.WORK
                                   address of command line text
                                                                                                           * now look for a tick
* lets look for a slash
                                                                                                          FTICK
                                                                                                                    CB
                                                                                                                           @STRING-1(R4),@TICK
NOQ
          MOV
                                   save buffer start address
                                                                                                                    JEQ
DEC
JNE
                                                                                                                          YETICK
R4
                                  save arg length
flag for passes
5 possible switches, p s, m, c or ?
save the slash address
look for a slash
                R1,R6
          MOV
          CLR
                 R11.5
                                                                                                                     JMP
                                                                                                                          NOSRCH
                 R5,@NOPMS+2
*R5+,@SLASH
FINDSL
          MOV
                                                                                                           YETICK MOVB @STRING(R4),R5
                                                                                                                    DEC
                GOTSL
           JEQ
                                   if we have one
                                                                                                                    MOV R4,@STLEN
CB R5,@LILP
                                                                                                                                                    save new filename length
                                   else decrement total arg count
and if we're not done, look some more
if we are done, blow this routine off
          DEC
                 BE
                 FINDSL
          JNE
                                                                                                                          NOLP
R5, P
NOLILS
                                                                                                                     JNE
                 GETFIL
           JMP
GOTSL
          CB
                 *R5,@P
                                   we found a /, now look for a 'P
                YESP
*R5,@LILP
                                                                                                                     JMP
           JEQ
                                                                                                                    CB R5,0S
JEQ PUTANG
                                                                                                                    CB
                                                                                                          NOLP
          CB
                                   a little p?
           JEQ
                 YESP
                                                                                                                    CB
                                                                                                                           R5,@LILS
          CB
                 *R5,@M
                                   more?
                                                                                                                    INF
                                                                                                                          NOLILS
R5, (
R6,6
          JEQ
                 VECH
                *R5,@LILM
YESM
                                                                                                                                                    if an S, then an angle will hold the type number is it a match?
                                                                                                          PUTANG L!
          CR
          JEQ
                                                                                                                           R5,@TYPES(R6)
                                                                                                          FTYPE CB
          СB
                 *R5,@S
                                   s?
                                                                                                                          TMÁTCH
                                                                                                                    JEQ
           JEQ
                YESŚ
                                                                                                                    DEC
                                                                                                                           R6
                *R5,@LILS
          СВ
                                                                                                                    JNE
                                                                                                                           FTYPE
           JEO
                                                                                                                     JMP
                                                                                                                           NOSRCH
          CB
                *95.0C
                                                                                                          TMATCH SWPB R6
           JĒQ
                                                                                                                    MOVB R6, TYPES
                                                                                                                                             show the type of file to search for
          CB
                *R5,@LILC
          JEQ
                YEST
                                                                                                          NOSRCH MOVB @NULL.@DIRTBL show no sub-directories yet
CLR @HITDIR
ABS @PRINT
JEQ OPENIT
          CB
                 *R5,@QMARK
          JNE
               NOPMS
                @TTYOUT
          DATA HELP, #
B @NOPRN3
                                                                                                                          RØ PRN
                                                                                                                    CALL 010
BL OPRNCR
LI RØ,60
                                                                                                                                             open printer
          SETO OCONFRM
YESC
                                                                                                                                             and do a crlf
                R12,21
YESM
                                                                                                                    MOV
                                                                                                                          RØ, @PLINES
                                                                                                                                            initialize lines per page
          MOV R12,@MORE
           JMP
                 SWAGN
                                                                                                          OPENIT ABS
                                                                                                                          @CONFRM
                                                                                                                                             we confirming?
          SETO @PRINT
YESP
                                                                                                                    JEQ NOCF1
          JMP
                 SWAGN
          SETO @SINGLE
INC R5
DEC R11
YESS
                                                                                                                    DATA CMSG1, 0
                                                                                                                                             view the dir....
SWAGN
         INC
                                  over the found arg
                                                                                                                   MOV @FNAME-2.@NOCF2
BL @TTYOUT
DATA FNAME
                                   arg counter
          JNE
                GOTSL
                                                                                                          NOCF2 DATA Ø
NOPMS
                95.0
                                   back to the /
                                                                                                                          @TTYOUT
          MOVB @H32,*R5
                                   and patch over it with a space
                                                                                                                    DATA YNA, #
                                  look for a space in the command line (filename) if ASCII 0-32, we have the filename don't have it yet, count down we done with arguments? we done with the 40 possible bytes of filename? if not yet
                                                                                                                   BL @GETKEY
AND! R1.>DFØØ
CB R1,@Y
JNE NOCFY
                                                                                                          NOYNA
GETFIL CB
                *R4+,@H32
                                                                                                                                            make uppercase
         JLE
DEC
                GOTFIL
           JEQ
                NOGOT
                                                                                                                   BL @TTYOUT
DATA Y,3
JMP NOCF1
          DEC
                GETELL
          JNE
NOGOT
                R4,WORK+1
                                                                                                          NOCFY
                                                                                                                   CB
                                                                                                                    CB R1,@N
JNE NOCFN
GOTFIL DEC R4
                                  back to the previous byte put a null after filename
          MOVB @NULL, *R4+
                                                                                                                    R۱
                                                                                                                          ettyout
                                                                                                                   DATA N.3
                 PØ R
                                                                                                                          RØ,30000
RØ
DELAY
                                  get logical filename from here
and put hardware name in the pab
what the hell is an alias prefix?
                R1, WORK
         LI
                                                                                                         DELAY DEC
                R2.LEN+1
          CLP R3
                                                                                                                    JNE
                                                                                                                          NOCF 3
                                                                                                                    JMP
         CALL OUTIL
                                   go do the parse
                                                                                                          NOCFN
                                                                                                                  CB
                                                                                                                          R1,0A
                                                                                                                    JNE
                                                                                                                          NOYNA
* see if a filename exists in the command line
                                                                                                                   BL @TTYOUT
DATA A, 3
                                  no string length yet
get length of total filename
counter for bytes after the '.'
         CLR
                OSTLEN
OKPTH
                                                                                                                  CLR OCONFRM
                @LEN,R1
          MOV
                                                                                                          NOCF 1
                                                                                                                                            point to the file pab
patch for an open
                                                                                                                   MOVB @NULL, *RØ
CALL @10
FNDDOT
         CB
                @FNAME-1(R1),@DECMAL
                                                                                                                                            go open it
         JEQ
INC
                GOTDOT
R2
                                  if we have a dot
bytes in the filename
                                                                                                                   MOVB GERBYTE, R1
                                                                                                                                            do we have an error?
                                  original bytes to device.filename
                                                                                                                                                (See Page 35)
```

#### XDIR-

```
(Continued from Page 34)
                                   if something is in ERBYTE we do
           JNE EXIT
 FIRSTR LI
          LI RØ,FILE
MOVB @READ,*RØ
CALL @10
                                   throw away the first record
           BL @GETKEY
CB R1,@CTRLS
JEQ PAUSED
 READIT BL
                                   check for a key
          CB
                                   wanna pause?
                 R1, @CTRLX
          JEQ MORDIR
ANDI R1,>DF##
CB R1,@M
                                   if 'x, go check next dire
           JNE
                 NORM
                 @MORE
CONTIN
R1,@P
CONTIN
          CLR
 NORM
          CB
           CLR
                 @PRINT
                 OPCLS
           BL
           JMP
                 CONTIN
 PAUSED BL
                 OGETKEY
                 R1.@CTRLQ
           JNE
                 PAUSED
 CONTIN LI
                                   point to the pab
           MOVB @READ, *RØ
                                   configure pab for a read
          CALL @10
MOVB @ERBYTE,RØ
                                   do a read
                                   get the error if no error
           JEQ READIN
 MORDIR LI
                 RØ. FILE
          MOVB @CLOSE, *RØ
CALL @10
                                   go close present file
 * look to see if any more dirs need displaying
         CLR @HITDIR
MOV @NXTDIR,RØ
MOV8 *RØ,R1
 NOCF 3
                                  get next directory name location
                                   do we have more?
          JEQ CLOSIT
LI RI, FNAME
 CLR QLEN
GETDIR MOVB *RØ+,*R1+
                                   filename length in pab
                                  move this directory name to pab
if it's not a null keep processing it
          JNE
MOV
               OKDIR
          MOV RØ, ONXTOIR
JMP OPENIT
                                   else show next dirname location
 OKDIR
          INC
                 QLEN
               GETDIR
 CLOSIT LI
                                  else close file
put close opcode in the pab
do the close
                 RØ.FILE
          MOVB OCLOSE, *RØ
          CALL 010
ABS 0PRINT
JEQ NOPRN3
                                   we printing?
if not
                PCLS
TTYOUT
 NOPRN3 BL
         DATA NOMEM, 2
BLWP @Ø
L! RØ, PRN
                                     .print a CRLF
 EXIT
                                  and return back to mdos
          MOVB @CLOSE,*RØ
CALL @10
                                  patch for a close
                                  close the printer
* ok, let's look at the record just read into RECBUF
first space over the line buffer
                                  with 80 spaces
OKREAD CLR
                R8
R10.RECBUF
                                 point to the i/o buffer
see if we have a filename
if there are no more filenames
make filename length a word
          MOVB *R10+.R8
          JEQ MORDIR
                R8,8
R8,@PTHNAM
R9,NAME
          SRL
          MOV
                                 point to destination for move move the filename into the screen buffer
MOVFIL MOVE *RIØ+ .*R9+
         DEC R8
JNE MOVFIL
  get the file type
GFT
         CLR @DORT
                                 go get the floating point number save for protected check absolute value of whatever is in r1, will be 1-6
                OGETEPT
         MOV RI, @ATTR1
```

```
MOV
                  R1,@ATTR2
           SWPB R1
           MOVE RI, TYPE
           SWPB R1
L1 R9,DECPLC
          MOVB @DECMAL, *R9+
MOVB @TYPES(R1), *R9
CB @ANGLE, *R9+
                                            put a '.' in the buffer
          CB
JNE
                  NODIR
                                            if it was a Ø, it was a dir
          DEC
                 R9
                                            back to the null
          MOV R9,R1
LI RØ,ANGLE
         LI R6,11
MOVB *RØ+,*R1+
PDMSG
                                            (directory)
          DEC R6
           JNE PDMSG
    we have a sub-directory - save the whole pathname
    unless we are doing single level processing
          ABS @SINGLE
JNE ONEDIR
                 @DIRLOC,R6
R7,FNAME
@LEN,R8
          MOV
                                        get present dir-name location (DIRTRL)
                                         get present pathname
and it's length
move pathname to table
          LI
          MOV
MOVPP1 MOVB *R7+, *R6+
                                         the present pathname length
          DEC R8
                MOVPP 1
                                        if not done, continue moving present path
now get dir name and add it to table name
          JNE
LI RT, NAME
PTHNAM EQU $+2
LI R8,8
MOVPP2 MOVB *R7+,*R6+
                                        for this length into the path buffer
         DEC R8
JNE MOVPP2
                                        put the dot at the end of dir name patch buffer to show end of path and one more to show no more dirs
          MOVB @DECMAL, *R6+
          MOVB @NULL,*R6+
MOVB @NULL,*R6
MOV R6,@DIRLOC
                                        show next available dirname location
```

The remainder of this program will appear in the May MICROpendium.—Ed.



#### Checkbook Manager III

# It's almost too good to be true

#### By HARRY BRASHEAR

I told you in MicroReviews I had found a checking account program that I felt was very good. While I had not yet fully checked the program out, based on what I had seen, I thought I had stumbled onto something special. I truly believe now that I have.

How would you feel if somebody handed you a checkbook program with four main menus, consisting of 31 functions? Those 31 functions break down into more than 50 sub-functions, and they *all* operate slick as a whistle. To further boggle your mind ... suppose the program was loaded with more than 300 account entries, just so you could have something to practice with.

I don't know about you, but I would want to take a look at it just for the experience.

The program I am describing is Checkbook Manager III, by Irving Crowley. Mr. Crowley is very much into the mainstream computer technology, particularly in the medical field. He has a real love for the TI and wrote this program primarily for himself some time ago. A few people liked it, so he put it into the fairware net. It

# Review

#### Report Card

Performance :	4+
Ease of Use	4
Documentation	В
Value	4+
Final Grade	A

Cost: \$10

Manufacturer: W. Irving Crowley, Lost Canyon Road, Pine Level, Alabama 36065

Requirements: Console, disk drive, memory expansion, Extended BASIC

is now up to version 5.4 and, I would assume, still going. Although there have been a few bugs to clean up along the way, an update usually represents a added application.

Before I get into the specific menus, I'm going to give you a quick, general idea of what the program will do for you.

Obviously, it's a program to handle your personal checking account, but it will just as likely handle your business too. I'm giving consideration to changing my own business accounts over to CBMIII. The one I have been using for eight years that I made myself, is nice, but I think this is better.

Assuming that you keep one year on a floppy, you could put more than 4,000 transactions on a DSSD disk. That's enough for any small business, and in reality, I think about 10-20 percent of that is all you would need.

The one feature that makes the program so valuable is that you may categorize every check you put in. You are allowed 40 categories/accounts, each with a alpha designation, and you should use these as you enter your checks. In another area of the program, you can search for, and load in all of a given category. You can do the same thing by month or payee too. The category files can be printed with totals, saved to a file, or, and get this, changed

to a D/V80 file for TI-Writer compatibility. This guy has thought of everything! Oh yes, and when you enter the categories into the log, you can also enter a budget amount that you can keep track of.

Here's a sampling of the screens you will be involved with. Please note that 95 percent of the program is in 40-column mode.

DATE C NUMB PAYEES (PAGE 1)	*	AMOUNT		
	===	=======		
0101 D 0001 CREDIT	*	232.59		
0101 5589 PACE CAR	*	29.00		
0102 L 5590 GAYFERS	*	21.92		
0102 5591 GAYFERS	*	13.89		
0105 5592 KOHNS GROCERY	*	31.73		
0105 F 5593 PONDEROSA RESTAUR	*	7.90		
0106 P 5594 HAR∞ DRUG ∞.	*	42.32		
0106 5595 KOHNS GROCERY	*	41.44		
0107 E 5596 CASH	*	15.00		
0107 D 1418 DEPOSIT	*	813.19		
0107 D 1419 CREDIT	*	300.00		
0107 E 1420 ATM WITHDRAWAL	*	55.00		
0107 F 5597 FAMILY MART	*	176.49		
0107 H 5598 HAROLD L SMITH	*	227.18		
0107 H 5599 MID-STATE HOMES	*	127.80		
0108 5602 KOHNS GROCERY	*	15.20		
0108 M 5603 DR PORTERFIELD	*	145.00		
0109 D 1443 DEPOSIT	*	539.90		
0109 E 1444 ATM WITHDRAWAL	*	20.00		
0109 5604 KOHNS GROCERY	*	5.70		

Press: (DEL INS PROCD AID REDO ESC P)

The screen above is from an area where you can delete, insert or just view the transaction records. The letters in the second column are for the categories, and the asterisks indicate that the check has been reconciled. As in most areas of the program, pressing "P" will allow a screen dump.

MEMOS - PAGE 1

1987 W.I. & C.A. CROWLEY MEMOS 106.00 01/01/87 RPR COMMISSIONS 10.00 02/14/87 SYS-3 PAYMENT 02/19/87 SYS-3 PAYMENT 8.00 02/10/87 RPR COMMISSIONS 50.00 1825.65 05/16/87 FED IRS REFUND 92.00 05/31/87 RPR COMMISSIONS 06/15/87 REBATE FOR TRIP TO 571.50 WILMINGTON, DE 285.35 06/22/87 ALA IRS REFUND 06/30/87 RPR COMMISSIONS 70.00 ........ETC.... 

Press: (DEL INS PROCD AID REDO ESC P)
Above is a screen dump of the Memos editing function. This
is a separate area where you can write memos on certain transac-

(See Page 37)

13620.08

## CHECKBOOK MANAGER-

(Continued from Page 37)	
tions if the Payee space is not enough.	
SYSTEM-III: Reconcile Acc	ount
	=========
~	
Enter date	01/25/89
Enter last statement balance .	223.00
Account To Date Summary	
Outstanding checks	0.00
Uncredited deposits	0.00
Files balance	258.08
Reconciled balance	223.00
Error correction	-35. <b>08</b>

Press (REDO), (P) to print, else (ESC)

The Reconciliation screen is shown above. The numbers I used were arbitrary, so the bottom line shows that a correction is needed. (Sorry 'bout that folks, but I don't have the time to get too perfect here.)

I need to tell you that one of the functions, Brute Balance, apparently starts at the top of your entries and works its way to the bottom. I started this function up and stared at drive No. 1 until my wife, with a gleam in her eye, called the mortician. Don't be fool enough to try this with 300 plus entries in the program ... unless of course you want to go to supper or something.

The next example you see is the result of a two pass collation. This is the result of an organized breakdown on a given month. The program searches for everything that takes place in Jan (the month I requested), separates all of the categories, then sorts them according to check number. This goes into a separate file, and again can be printed out. I took this opportunity to check out the D/V80 conversion function, then I loaded the resulting file into this review. Everything obviously worked like a charm.

	001 CREDIT		*	5051.68
	406 Jerry F		*	271.80
	412 Jerry F		*	271.80
	424 Jenny F		*	271.80
	427 Jerry F		*	271.80
0131 B 4	432 Jerry F	Robertson	*	271.80
0104 D 0	002 DEPOSIT	Γ	*	1185.63
	003 DEPOSIT	•	*	707.58
0114 D 0	004 DEPOSIT	Г	*	160.00
	006 DEPOSIT		*	22.81
0118 D 0	005 DEPOSIT	ſ	*	1127.42
	007 DEPOSIT		*	1030.52
0105 F 44	407 Etowah	Florist	*	60.00
0105 F 44	408 Blair's	Bo-Kay	*	47.50
0111 H 4	415 Meadowb	prook c.wee	*	85.16

0113 H	4416	Torbett L.Call ut	*	84.63
0113 H	4417	Arron Crumley car	*	200.00
0113 H	4418	Jimmy Gordon	*	200.00
0120 H	4425	Spencer's xmasbak	*	595.08
0121 H	4426	West.Auto Newman	*	81.70
0110 J	4413	Barbara Ammons	*	50.00
0117 J	4423	Barbara Ammons	*	50.00
0124 J	4428	Barbara Ammons	*	50.00
0131 J	4431	Barbara Ammons	*	50.00
0131 L	4429	WORLD CHRIST BROA	*	150.00
0117 P	4422	S.C.Bell	*	30.04
0105 R	4409	BVACK Broadcast	*	115.00
0105 T	4411	20 cent. Christia	*	3.18
0110 T	4414	Rule Furn. tapes	*	13.90
0113 T	4419	Hurt Pub.posters	*	39.84
0117 U	4420	Et.Utilities	*	280.05
0101 V	4405	State Farm Ins.	*	127.50
	4421	Conoco gas	*	22.01
0101 b	4401	Garren Realty ren	*	225.00
0101 b	4402	Jerry Robertson	*	268.70
0105 c	4410	U.S.Post Off fee	*	50.00
0131 h	4430	chat.child home	*	96.15

I want to note just a couple of other operation features before we go into the menus. When you put money into the bank, DEPOSIT must be the first word used in the memos column. CREDIT can be used to indicate interest on one of that type of account. The program looks at these words for instructions, so they must be used. Anything else is considered a check and the amount is deducted. Also, when entering the check numbers, you put in the number of the first one and the program automatically increments from there. A nice feature.

Now, here's a quick rundown of the entire menu.

Subtotal this file:

- 1. System Documentation: This will print the full docs to your printer or to the screen.
- 2. Log/Review Transactions: Enter new account transactions or review past entries.
- 3. Files Editor: Insert or delete transactions. The program rebalances the full account on completion.
- 4. Reconcile Account: This is where you check off your returned checks and make sure everything is shipshape.
- 5. Re-number Records: You might want to renumber the records after deletions or whatnot. Record numbers are often required for searches.
- 6. Backup files: This section will backup/copy the records of the four major files. It does it by loading the records into an array and then reading them out to a new file. This is assumed to be more accurate than "file copying."
- 7. Write/Review Memos: This is where you can enter additional information and notes on your finances.
- 8. Printer Addressing: Change the printer designation, which reads out to a small file for future reference.

(See Page 41)

## **TI-Runner Level Editor**

# Put the excitement back into the race

By BOB CARMANY

Okay, you have just finished yet another round of TI-Runner and once again it was a bit less of a challenge than the last time you played it. It seems that once you figure out the screen patterns, games become a bit boring, don't they? In fact, they usually end up at the back of the disk box and are relegated to the "once every six months" playing cycle. There must be some way to put some life into playing an old favorite. Well, there is!

The TI-Runner Level Editor will allow you to program an unlimited number of new and different screens and "juice up" the well-worn TI-Runner game.

Once you have decided you should get a TI-Runner editor program, the next question is: "Why should I get a commercial software program?" After all, there are a couple of "fairware" versions floating around that do the very same thing — or do they? Let's take a look and see!

Performance: Who said. "I have some good news and some bad news?" This software package is sort of like that and we will start with the "good news" first. The program actually works well. Everything does what it is supposed to (with a few exceptions to be noted later). Since it is an XB program with some Assembly routines tied in, everything moves quickly and smoothly.

The program is broken down into three basic segments. There is a Level Management portion with a sub-menu that allows the user to manipulate both the 50 original TI-Runner levels plus an additional 44 advanced levels. You can change any of them at will or create new files. There are extensive instructions in the documentation for creating your own levels. There are even some rather nasty hints for the devious mind - transparent ladders, anyone? In fact, you can change colors of the screen itself as well as the treasures and ladders that appear on it. One of the features I enjoyed the most was the ability to delete or copy individual levels without having to redo an entire file.

The second segment is the File Management section. This is something that the more rudimentary editors lack. Basically a disk manager program, it lets you disk

## Review

#### Report Card

Performance	. B
Ease of Use	. A +
Documentation	. <b>A</b> +
Value	В
FinalGrade	B+

Cost: \$18.75

Manufacturer: EB Software, 12912 Villa Rose Dr., Santa Anna, CA 92705 Requirements: Console, Monitor or TV, Disk System, memory expansion, Extended BASIC, TI-Runner (to play the finished screens)

drives, create filenames, delete files or select the current file as your working file. It is nice to be able to manipulate the files you have worked on without having to exit from the program and crank up another program just to do some elementary disk maintenance.

The third segment of the program is a bit unusual. TI-Runner uses a screen file called "LEVEL28" to store the various difficulty levels. Prepare a Screen File for Play is an easy way rename the file appropriately without having to exit from the program. Just make sure you send it to the right disk drive!

All of these options perform well. Why the "B"? Well, I would expect some errors (as opposed to "bugs") in a noncommercial program but not in something produced commercially. Background becomes "backround" in the Level Management portion of the program. Inserting a space between the last character in each of the input prompts and the default choice would make the program much more pleasing to the eye. After all, we are expecting people to spend money on the program!

In addition, the menu options in the documentation don't match those on-screen in the File Management part of the program. Change Drive becomes Change Disk on-screen and Pick Current Screen File becomes Pick Default Screen File. I know,

these are all minor points but the program should have been more closely proofread before it was released. Those are just the minor annoyances.

I also question whether the Prepare File option wouldn't be more logically included in the File Management part of the program than as a separate main menu option. Again, that is another relatively minor point.

The most serious shortcoming in the program is the error handling. For example, if you try to save a file too big for the available disk space, the program saves as much of the file as possible and then BREAKs with an ungracious "burp." A couple of ways exist to solve this problem and allow a more elegant and graceful exit. Ease Of Use: The TI-Runner Level Editor is, on the other hand, a very easy program to use. Everything is menu-driven from selecting the options within the various program segments to selecting color changes for the ladders and treasures. You don't have to wade through reams and reams of documentation or experiment for hours on end to get the program to do what you want it to do. It is "bug-free" and with little preparation anyone can be creating his own TI-Runner screens within a few minutes of unwrapping the package. A resounding "A+!"

**Documentation:** The program comes with a booklet of some four double-sided pages. The instructions are concise and to the point. System requirements, introduction and descriptions of the program segments follow. The customary caution about backing up the program and "operating" on a copy is sound advice.

Each menu and sub-menu option is explained with a line or two of text. There is usually no need to go into more detail since you should be looking at the computer screen while reading the docs — the first time at least. There are a couple of pages of explanation about creating your own screens and, once again, the instructions are simple and to the point. There is no confusing jargon and everything is more than adequately explained. There are even a few hints to make your TI-Runner screen

(See Page 41)

### **MICROreviews**

# A serious formatter for TI-Writer and a utility to control Multiplan printouts

#### By HARRY BRASHEAR

Ratings for the software reviewed in this column are based on a star system as follows:

- ★ Leave it alone, back to the drawing board.
- ★★ Needs improvements, but workable.
- $\star\star\star$  A good program, worth trying.
- ★★★★ Send your money and buy it.

#### \*\*\*\* TI-WRITER V4.01

Well, finally, someone has stepped on the hallowed ground of the TI-Writer Formatter. Other people have done work on the Editor, most importantly Funnelweb from Australia and BA-Writer from Italy. To the best of my knowledge, however, no one up to now has actually added to, or upgraded the Formatter dot commands.

I was thrilled when I heard that RAG Software was working on the program that I spend most of my time with. I sent my \$10 (the fairware fee) and had it in hand within 10 days. Great service! Here is a listing of the major improvements:

- 1. PC nl n2 n3..: Printer Control This command will allow you to send printer control codes without using transliteration.
- 2. DU n, DB n, DM n, DR n: Define Underscore, Define Boldface, Define Mail list, Define Required space — All of these will allow you to use other characters for the titled functions. Ordinarily they would be the ampersand, the "at" sign, the asterisk. and the caret, respectively. The formatter will still default to these signs if you don't use the above commands, but the option is, at least, open to change them now.
- 3. AI: As Is text This is the same as the NF command except that it leaves the left margin alone. You can reinstate the normal
- **4.** CP n: Conditional Page eject This one is really neat. If you only have a line or two left on the page it will hold back on the page-break.
- 5. CF filename: Chain Files When this command is encountered, the formatter stops and waits for you to enter another disk. This will allow unlimited text length.
- **6.** QQ: This command after FCTN 9 allows you to just Quit. You will not have to go through a verification key press.
- 7. CTRL comma and period: Shows line one and (E)nd line, respectively.

There is a general speed up of all functions, particularly in the Move, Copy, and Delete commands. I found a vast improvement in the cursor speed as well.

A very nice feature is the incorporation of installation programs for both the Editor and Formatter. For instance, in the Editor you can set your, column width, tabs, colors, character file and printer designation. This information is then saved to the Editor program and becomes your defaults. Very handy! It's also interesting to note that the CHARA file is loaded into the program and is no longer needed on the disk.

If you have a SuperCart, you can use it as a menu to dump back and forth between the Editor and Formatter. There are also three additional menu items (UTIL1 to UTIL3) for your use.

By the way, (I'm sorry for the interruption) if you don't own a SuperCart yet, get one! I find that more and more, software people are making use of the extra memory in these things. They are no longer a mystery to the novice user, and can be handled very

A couple of bugs that were found in the original TI-Writer have been cleaned up, such as the use of double "at" signs and ampersands, and a problem with asterisks when not in MailMerge.

One final notable change is in the Formatter: If you enter "L" at the "Pause At End Of Page" prompt, the Formatter will not execute any line spaces at the top of the page. Very handy for let-

(See Page 40)

# Calendar Maker **Utilities**

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### MICROREVIEWS-

#### (Continued from Page 39)

ter head paper in single sheets.

All in all, this is a super effort by RAG. The version I have is 4.2 and I am hoping that the effort goes forward from here. Mr. Green seems quite concerned about the size of the files, (trying to make them smaller) but I would rather see features added and lose a few hundred bytes of text space. Also, I had trouble with the AI command—couldn't make it work right on my NX1000. It could have been me though, so I'll just mention it and forget it. (But I want it!)

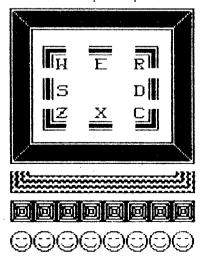
Send \$10 to RAG Software, R.A. Green, 1032 Chantenay Dr., Gloucester Ontario, Canada, KIC 2K9

## \*\*\*\* ARTIST BORDERS I, II, III

I don't know how many of you have discovered the utility of these three disks yet, but, I thought I would mention them in passing.

Borders were the brainchild of Robert Coffey of the WNY 99ers originally, and he was responsible for the first disk full of them from Asgard. The concept was then picked up by Paul Scheidemantle of the Great LaKes group and he created the next two disks.

Borders are handled the same way as fonts are in TI-Artist. They are loaded in as a font into the enhancement section, and then typed in as text. (See the key presses for the segments below.) Each segment of the border is then put into place with the



joystick/keys, and checked for alignment with "T" before it is dropped.

There is no loss for styles of borders as they run from the simple to the super elaborate, including many special interest items, such as sports. There are at least 30 different ones on each Artist disk, and, as I recall, about 75 on the Picasso Borders disk. (You must have Picasso V2.0 to use these.)

These disks are real time savers and will really jazz up your graphic creations. The cost is \$7.95 per disk for Borders I, II, or III, plus .75 shipping. Picasso borders cost is to be announced.

Send to Asgard Software, P.O. Box 10306, Rockville MD, 20850

## \*\*\*\* MULTIPLAN PRINTER CODES

Wow, talk about researching your product! ...and I think this one is unique too. (I don't think I've seen anything like it before.)

How do you feel about creative Multiplan printouts? It could be the best thing to happen to Multiplan since creative bookkeeping.

Using this program, you can now cure the humdrum spreadsheet printout. It will allow you to enter printer codes, suitable to your own printer, into a blank cell in your template. For instance, if you would like a double-wide title, just enter the code for double wide in a cell right before it, and presto, you will have your hearts desire. If you have a large spreadsheet, you could kill the perf skip, enter subscript codes, special line feeds, and get one heck of a lot of information on a single page.

The author of this programing went all out for everyone in the community. There are files included for 13 printers, so I guarantee, whatever you've got, they have you covered. There are eight pages of docs to tell what codes to use for the various printers, and how to use them. (I do wish they had put just one example template on the disk though, to give people a visual idea of what they would get.)

I tried the system out, and even though I'm not too good at Multiplan, I was able to use the codes easily. If you are like me and keep a template for a specific sheet, you can set up a few cells just for the codes

and then resave it. I think this is a dynamite idea, and I think anyone that uses Multiplan should have it around.

Send \$10 to Jack Mathis, 5941 E. 26 St., Tucson AZ, 85711

I want to thank all of the folks that are sending me homebrew software. I am getting to it as I can, but be advised, that I do try to avoid repetition. I have received many checking account programs for instance that are quite nice, and I will be reviewing a couple of them. (At some point I may sit down and compare them all.) The problem is that I want to give the column variety, so some of these will have to wait a while. I would like to see some more games, music collections, and maybe some picture collections for TI-Artist. What ever you have done, send it along, I promise, I will not embarrass a homebrew author.

Finally, I am having a problem concerning my Home Publishing Manual. Many of you have purchased it through groups or fairs and haven't sent your registrations to me yet. You are supposed to get two supplements to the manual, but if I don't know where to send them, you're out of luck. The first supplement has gone out, so if you don't have it yet, you'd better let me know what your manual number and address is. Until next time... HTB

Anyone who would like his software considered for review in this column may send it to the following address. Include a SASE if you would like it returned: Harry T. Brashear, 2753 Main St., Newfane NY, 14108

## Miller to speak in LA

Craig Miller of MG will address the LA 99ers' meeting at 7:30 p.m. June 28 in the Torrance Public Library meeting room, 3031 Torrance Blvd., Torrance, California.

Miller will demonstrate a professional desktop publishing system run on an IBM AT. MG's releases include Advanced Diagnostics, Explorer, Diskassembler, The Smart Programming Guide for Sprites, The Smart Programmer, *The Orphan Chronicles*, Night Mission, GRAM Kracker, Turbo XT and Super Extended BASIC.

Steve Mehr, program chairman, said the purpose is to help provide ideas for TI programmers. For further information, contact Mehr at (805) 379-2937.

### CHECKBOOK MANAGER—

#### (Continued from Page 37)

- 9. Collate/Edit Files: Collates by category, date or payee. Then you can save, load, display or edit the collated files.
- 10. Collated Files Printer: Print out a report on said files, including totals.
- 11. Print Transactions: You may print out the entire file or a selected block.
- 12. Initialize All Files: This is what you use to begin working with the program on your own, or to start a new year. This function includes password entry.
- 13. Household Budget: Create, save, load, review, or print your budget.
- 14. Disk Directory: Check the files on your disk.
- 15. Print Amortization: A super program that includes total interest paid for each year.
- 16. Annuity/IRA Calculation: As the name implies, this is a calculation device for these types of accounts. Very handy.
- 17. Convert to DV80: Convert any of your record files to text format. This is super handy for various reports or whatever reason you might have to include them into a document.
- 18. Compound Interest: Calculates compound interest function for savings or loans.
- 19. Copy Transactions: This function, unlike "Backup Files", will copy only the transactions file.
- 20. Brute Balance: Recalculates your account from scratch. This was added in case of any minor bugs between the program segments. It's probably not necessary any more, but may be handy if you happen to mess up one of your files.
- 21. Modify File Records: Unlike the preceding editor that recalculates automatically, this function allows you to edit everything as a string. If you make a change in the amount column though, you will have to go back and pass through the Brute Balance.
- 22. Display Transactions: This is just a viewing mechanism for the transactions file. No editing is allowed.
- 23. Log Codes and Budget: This again allows you to do editing chores and printout your budget and codes.
- 24. Two Cycle Collation: As explained above, this pulls out a month and collates the codes within the month by check number.

- 25. Sorted Files Printer: This function will take the two cycle collation and print out each separate account with its individual total, plus the gross total for the entire file. Super function!
- 26. Year-To-Date Budget: Here's another beautiful function that set's this program apart. Remember the budget you set up? This will look at as many months as you want and print out the budgeted amount, actual, and year-to-date.
- 27. Un-Clear Transactions: This is a desperation function. It will un-clear all transactions so that you can go back through all of your checks and replace the asterisk.
- 28. Find Variables: This is a very handy tool. If you would like to put this program on your RAM disk, this program will go through a "listed" program and locate a string like "DSK." It will tell you all of the lines the string can be found on so that you can change them to "DSK5."

A couple of other items were too simple to get into, but handy just the same. The bottom line is that I have never seen anything quite like it. Having gone through the entire program by now, I am convinced that I am going to use it myself.

It is a huge program and requires many segments. Each item you select from the menu is a separate entity, and must be loaded in, but there is good reason for this. The arrays are quite large and really use the TI's memory to it's limit. Also, to make the entire program as user friendly as possible, and, to give the maximum accuracy, each segment is fairly good-sized. The whole thing is done in Extended BASIC, using assembly subroutines where it can. (i.e. The 40-column mode.) This should not detract from the program however. In the hands of a master, Extended BASIC is as good as any.

If there is a down side at all, it's probably the docs. I felt that Mr. Crowley's intellect was dribbling over into them a bit, and some of his words could have stood a little definition. Also, some of the newer functions were not made clear in the hardcopy. However, these new functions had a help screen and I would like to see these carried back to the beginning. Since there are so many functions, the new user would find these helpful. Doc referral on a cluttered computer desk can be a pain. The more you

can put in the program the better. I guess that's my only complaint about this package ... and it's more of an observation than a complaint.

CBM III SHOULD cost \$99.95, but it can be had for a paltry \$10 direct from the author. When you send your money, tell him what disk format you want as he can accommodate most anything. If you have the need for a program of this type, buy it! If it doesn't cover your needs, you'd better look into a mainframe.

#### **EDITOR**—

#### (Continued from Page 36)

more pleasing (or more difficult).

The final segment of the documentation describes the File Management section of the program. Once again it is succinct and straightforward. The only anomaly was the mismatch between the on-screen menu selections and the documentation, pointed out previously. The descriptions of the various functions, however, were excellent.

Value: The value of a program is ultimately how much you use it. In this case, if you are one who enjoys playing TI-Runner, this program will be well worth the asking price. It has functions that the "fairware" editors for TI-Runner don't have and is easier to use than any of them I have seen to date. Quite frankly, I find the price just a bit high for the rather specific niche that this program occupies. But, then, it all depends on your perspective.

Final Grade: Documentation, simplicity, and ease of use are the strongest points of the EB Software TI-Runner Level Editor. It can be mastered with a minimum of preparation and the fruits of your labors can give you many hours of entertainment. On the downside, the errors in the program shouldn't have escaped into a commercially released program. It is still a good piece of programming — remember "C" is average.

Note: The shortcomings in the program can all be corrected by anyone with a bit of Extended BASIC programming expertise. The XB portion of the program can be listed and the necessary changes made. Just make sure that you make the changes on a COPY of the original program and test everything thoroughly when you are finished. The point is, though, you shouldn't have to.

# Newsbytes

# Tenex remains with TI market

Despite reports published elsewhere, Tenex Computer Express intends to remain in the TI market, according to Roger Dooley of Tenex.

Dooley says the company has eliminated a number of "slow moving" TI products from its TI lineup. These are mainly products "which have not been changed or improved in three or four years," he says.

He says the company "cut a good number of titles," in which the suppliers received small orders from Tenex. Tenex employees "spent a lot of time chasing items" of this type when an order was received for them, Dooley notes.

He says Tenex is still searching for new products for the TI market. He says TI users want products "in line with what people can get for other computers."

He cites interest in TI-Base and the forthcoming Press as examples of this type of product.

He notes that "mainstream developers" feel that it is more profitable to write for other machines. Dooley says that the aftermarket for the TI99/4A reflects the 4A's quality.

"I remember when the 4A's main competition was the Vic-20. The Vic-20 aftermarket died four years ago," he notes. "When they came out, the marketplace didn't recognize the difference between the two machines."

However, he says, the level of development activity for the 4A has declined.

He says one reason for the elimination of a number of titles is the planned move by Tenex into another facility in early May.

Address and phone number will be the same, P.O. Box 6578, South Bend IN 46660, and (219) 259-7051.

# Trophy offered by Melbourne group

The TI99/4A Users Group — Melbourne Inc. in Australia is conducting a TIMES Trophy competition, open to all TI99/4A owners who are members of a recognized user group.

The competition is for the best 1989 proet developed by qualified entrants. Each user group will be allowed one entry only and it will be the group's responsibility to choose its entry.

The entry can be a program or a piece of hardware. It must be for the TI99/4A. "If it works on the Geneve all well and good," the contest rules state.

The trophies are valued at approximately \$100. No entry fee is required.

The competition is open to freeware, fairware, commercial ware programs or tutorials: it is also open to hardware modifications to the T199/4A.

Programs must be submitted on disk readable in TI-Writer or its equivalent. Hardware must be submitted as detailed drawings and instructions for building the hardware, accompanied by details of what it set out to achieve.

Anything published before Jan. 1, 1989, is disqualified from entry. Entry deadline is Sept. 1.

The Melbourne Times newsletter says Melbourne has designated its Oct. 14 meeting as the date of a computer fair to run from 2 to 6 p.m. at its regular meeting place, in the Pavilion at Deepdene Park, Whitehorse Rd., Deepdene. The winner of the trophy will be announced at the fair. It will be presented to the winner or representative of the winners group, if in attendance. Competitors must attend at their own expense.

Address for entry for the competition or information on the fair is TI99/4A Users Group — Melbourne Inc., 88 Main St., Blackburn, Victoria 3130, Australia.

## CPUG schedules fair

The Third Annual CPUG Computer Exposis scheduled from 7 a.m. until 2 p.m. Oct. 15 at the Carlisle Fairgrounds on Clay Street in Carlisle, Pennsylvania.

Door prizes, demos, computer vendors, tailgating and user groups are scheduled.

Admission is \$3, with women and children under 12 admitted free. Admission to the tailgating area is \$2.

The event is sponsored by the Central Pennsylvania 99/4A Users Group and cosponsored by the Cumberland County Amateur Radio Service and the 6th Annual Cumberland County Hamfest.

For further information, contact the Central Pennsylvania 99/4A Users Group, P.O.

Box 14126, Harrisburg, PA 17104-0126, or call the WIZ/TIB BBS, (717) 657-4992 or 657-4997.

## Review errs on price

The review of FirstBase, a database by Genial Computerware, published in the January 1989 issue, listed the wrong price for the program. Correct price for the program is \$49.95.

FirstBase is manufactured by Genial Computerware, P.O. Box 183, Grafton, MA 01519.

# Italian seeks to form TI users group

Giancarlo Antici asks that any Italian TI and Geneve users who want to form a users group write him at via G. Cardano 170, 00146 Roma, Italy.

## Three for two, not one

The article on Quality 99's sale extended to May 20, should have said the company is offering three programs for the price of two (lowest-priced program free), rather than three for the price of one.

Quality 99 Software is at 1884 Columbia Rd. #1021, Washington, DC 20009. Phone is (202) 667-3574.

Newsbytes is a column of general information about products and services relating to TI users. The publisher does not necessarily endorse products listed in this column.

### **USER GROUP UPDATES**

The following are additions and updates to our user group listings, which we began publishing in the May 1987 issue.

#### California

**TI-Riverside User Group,** c/o Ed Butcher, President, 7125 Delaware St., Riverside, CA 92504. Phone: (714) 686-0336. (New address.)

#### Htah

**Ogden TI Users Group,** 1396 Lincoln Ave. Apt. B, Ogden, UT 84404. (New address.)

## Outside U.S.

#### Australia

TI-Brisbane User Group, P.O. Box 57, Aspley, Queensland 4034, Australia. Garry J. Christensen, president. Meets at 7:30 p.m. last Friday of each month at South Brisbane State School. Membership fee \$22 national, \$35 international. Software and publication library, 11 newsletters per year.

## User Notes

# The index saga goes on... and on

Once a ball starts rolling down a hill, it just keeps going. And that seems to be the story of the ever-evolving MICROpendium Index. This comes from Elton Schooling, of Sacramento, California, author of the index. He writes:

The MICROpendium indexes sort routine takes almost four times as long as it needs to. Mr. Gasparini, writing in the December 1988 User Notes, says that the long sorting process is "a bit uncomfortable."

I obtained an assembly language sorting routine from the Boston Computer Society TI99/4A User Group, authored by David Romer and John Clulow, and running in Extended BASIC. With this, things go much better. In order to use the faster sort, the assembly language program must be on the same disk, and there are a few changes to be made in the program. The line numbers I inserted in the early part of the program follow: (referring to the index program for 1984 which was published in the June 1988 edition).

52 CALL INIT

54 CALL CLEAR

56 CALL LOAD("DSK1.SORT")

Of course, you would use whatever drive number you wish in line 56.

Change line 130 to read:

130 CALL LINK("SORT", N\$(), XXX)

Where XXX is the total number of DATA statements, and agrees with the DIM statement in line 80, DIM N\$(XXX), with the array-loading statement in line 120, FOR I=1 TO XXX, and with lines 190 and 310, both of which read FOR J=1 TO XXX.)

Delete the old sort routine after the last DATA statement, and make appropriate changes in line 30, which should give David Romer and John Clulow their due.

The 1987 index, with 304 entries, required 256 seconds to complete the sort. Using the assembly language routine, the time shrank to 66 seconds. For me, compared to more than four minutes, this is blinding speed. Progress!

The installment in this month's MICROpendium includes the object code

of the sort routine as well as the lines in the program that CALL the routine.—Ed.

# Program puts digital clock on the screen

If you've ever needed a timer for your TI, the following program may meet your needs. Written by D.L. Fitchorn of Keller, Texas, it places a digital clock at the top of the screen and records elapsed time. The program remains in memory even after a CALL INIT, QUIT, BYE and NEW, although the counter may reset itself to zero after execution of some commands.

The program requires Extended BASIC and an expansion memory.

After entering the program listing — don't bother typing in the checksums that appear after the exclamation marks at the end of each line — save it and then RUN it. After it has loaded into memory, it takes a minute or so, enter:

#### CALL LINK("START")

Use this CALL anytime you want to reset the clock counter to zero.

The clock will continue to operate even after loading and running another program.

```
100 !-----
 ! 130
110 !
       EXTENDED BASIC
 !119
120 !
      program to load
 1063
130 !interrupt driven clock!
 ! 101
140 !
      By D.L. Fitchorn
 ! 136
150 !
          305 Navajo
 1059
160 !
          Keller, TX 76248 !
 !230
170 !-----!
 ! 130
180 CALL INIT ! 157
190 CALL LOAD(-31806,16)!107
200 CALL CLEAR !209
210 T=24 :: HH=0 :: MM=0 ::
SS=0 !189
220 R=10240 :: CH=0 !152
230 PRINT "LOADING CLOCK PRO
GRAM" !058
240 HX$="0123456789ABCDEF" !
251
250 READ A$ !252
```

```
260 IF A$="CHEK" THEN 350 !1
270 IF A$="END" THEN 370 !05
280 IF LEN(A$)<>4 THEN PRINT
 "ERROR"; A$ :: GOTO 250 !045
290 HI=(POS(HX$,SEG$(A$,1,1)
,1)-1)*16+POS(HX$,SEG$(A$,2,
1),1)-1 !198
300 LO=(POS(HX$, SEG$(A$, 3, 1)
,1)-1)*16+POS(HX$,SEG$(A$.4.
1),1)-1 !212
310 CALL LOAD(R,HI,LO):: R=R
+2 !122
320 CH=CH+H1 :: IF CH>256 TH
EN CH=CH-256 !141
330 CH=CH+LO :: 1F CH>256 TH
EN CH=CH-256 !151
340 GOTO 250 !073
350 PRINT "CHECK"; CH !005
360 GOTO 250 !073
370 CALL PEEK(8196,H,L)!153
380 LFAL=H*256+L !093
390 NEWL=LFAL-16 !006
400 KH=INT(NEWL/256)!239
410 KL=NEWL-KH*256 !011
420 CALL LOAD(8196,KH,KL)!04
430 CALL LOAD(NEWL, 83, 84, 65.
82,84,32,40,0)!036
440 CALL LOAD(NEWL+8,83,84,7
9,80,32,32,40,40)!023
450 CALL LINK("START")!094
460 CALL LOAD(10543,T.O.HR.O
,KH,0,SC)!167
470 CALL CLEAR !209
480 END !139
490 DATA C820,28EA,292C !010
500 DATA C820,28E8,2928 !246
510 DATA C820,28E6,292E !001
520 DATA 04E0,2930 !133
530 DATA 04E0,2932 !135
540 DATA 04E0,2934 !137
550 DATA 0200,282E !129
560 DATA C800,83C4 !155
570 DATA 0458 !058
580 DATA 04E0,83C4 !153
590 DATA 045B !058
600 DATA CHEK ! 122
610 DATA 0300,0000 !097
620 DATA 02E0,2928 !138
630 DATA 0602 !039
640 DATA 1652 !045
650 DATA COAO, 28EA ! 178
```

(See Page 44)

## User Notes

(Continued fro	m Page 43)
660 DATA 0586 !	050
670 DATA 0286,0 680 DATA 160E !	03C !132
680 DATA 160E !	059
690 DATA 04C6 !	060
700 DATA 0585 !	049
710 DATA 0285,0	
720 DATA 1609 !	047
720 DATA 1609 !! 730 DATA 04C5 !!	059
740 DATA 0584 !	048
750 DATA 80C4 !	062
750 DATA 80C4 ! 760 DATA 1605 ! 770 DATA 04C4 !	043
770 DATA 04C4 !!	058
780 DATA 0283,0	030
	030
800 DATA 0584 ! 810 DATA CHEK !	122
820 DATA 06C0 !	122
830 DATA D800,86 840 DATA 06C0 !	
850 DATA E020,2	U36 054 1150
	002 1151
870 DATA 4020,2	BE4 : 145
880 DATA D064,2	
890 DATA 0941 !	
900 DATA 0221,9	
910 DATA D801,8	050 : 150
920 DATA 0A41 ! 930 DATA 0241,0	U53
940 DATA 0221,9	123
950 DATA 0801,8	A00 1100
960 DATA 0201,9 970 DATA D801,8	AUU : 123
980 DATA D065,2	0EC 117E
900 DATA 0041 1	046
990 DATA 0941 ! 1000 DATA 0221, 1010 DATA D801,	043 0000   100
1000 DATA 0221,	9000 : 100
1020 DATA 0A41	1052
1020 DATA 0241	:033 0500   133
1030 DATA 0241,	0000 :123
1030 DATA 0241, 1040 DATA 0221, 1050 DATA D801,	9000 : 100
1050 DATA 0001,	0000 : 130
1060 DATA 0201, 1070 DATA D801,	9AUU : 123
•	
1080 DATA D066, 1090 DATA 0941	
	9000 !108
1110 DATA D801, 1120 DATA 0A41	
1130 DATA 0241, 1140 DATA 0221,	
1150 DATA 0221,	8C00 : 106
1160 DATA 0720,	
1170 DATA 0720,	
1180 DATA 02E0,	
1190 DATA 0250,	
TISU DATA U43D	. 000

```
1200 DATA 4000 !035
1210 DATA 000D !051
1220 DATA 0017 !039
1230 DATA 003B !052
1240 DATA 0001,0203,0405 !17
1250 DATA 0607,0809,1011 !19
1260 DATA 1213,1415,1617 !19
1270 DATA 1819,2021,2223 !19
1280 DATA 2425,2627,2829 !20
1290 DATA 3031,3233,3435 !19
1300 DATA 3637,3839,4041 !20
1310 DATA 4243,4445,4647 !20
1320 DATA 4849,5051,5253 !20
1330 DATA 5455,5657,5859 !22
1340 DATA DATA CHEK ! 185
1350 DATA END !053
```

# A modification to the SXB mod

This comes from John McKechnie of Vancouver. He writes:

I did the modification to my Super Extended BASIC as described in the February 1998 issue (Making SEB work with the Widget cartridge expander). However, with a very slight modification to the points where you attach the resistor leads to pins 19 and 29, you won't have to cut the cartridge shell. The trace for pin 19 goes straight back to a solder point while the trace for pin 29 goes back to a plate through hole on the board. The resistor leads can be soldered to these points, which are behind the part of the shell that would interfere with the resistors.

#### HAVE A GOOD TIME

Attend a TI fair this year and find out what's hot and what's not.

(See Page 46 in this edition for a listing of 1989 fairs)

## MORTCOMP bugs

This comes from Enrico Gasperini, of Towaco, New Jersey. He writes:

This is in regard to the MORTCOMP program in the March 1989 issue. There are a few errors in the variables that will cause the program to calculate the wrong answers. In lines 280, 290 and 690 the variable should be PPI not PI as printed. This variable is established in lines 150 and 160. The variable PI is a reserved word in the TI99/4A and will always return a value of 3.141592654 in Extended BASIC. Also, in line 270, the CALL KEY statement should be (IF S < 1 THEN 270), not S > 1. This will stop the scroll and wait for the next key press.

As for the printing format of this program, the type style is more readable than the computer printout that you have been using but I still prefer the type style you used, for the last time, in the August 1989 issue in 28 columns. This is the standard dot matrix draft mode and in my opinion much more legible.

The errors above were due to the translation process between the computer and the typesetter. Starting with most of the programs in this issue, we are using a 24-pin dot matrix printer for program listings using a san serif font. BASIC and XBASIC listings, as always, are in 28-column format. We're hoping that these listings make better reading.—Ed.

## Advice on using Smith Corona module

This comes from Richard Ohi, of Derry, Pennsylvania. It is in response to a question posed by a reader in the March 1989 issue. He writes:

I have the Smith Corona Messenger Module and a Smith Corona Memory Correct III typewriter and have been using it as a printer with both the TI RS232 card and the CorComp RS232 card. I would suggest to first check the parallel cable. The pins should be connected as follows:

TI99/4A Centronics
parallel port 36-pin connector

1 1 1 2
(See Page 44)

## User Notes

(Continued	from Page 44)
4A port	typewriter port
3	3
4	4
5	5
6 .	6
7	7
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9	9
10	11
11	19
12	
13	
14	
15	
16	16

Connect the parallel cable to the Messenger Module (only one cable should be plugged into the module). Turn the typewriter power switch and the keyboard switch on. Press and hold the typewriter "CODE" key and press the typewriter "P" key. The Preset and Programmed LED lights on the typewriter and the power light on the module should be on. The typewriter should now act as a printer for the computer.

## Routine works like NEW in XB programs

This comes from Denver Earl Sullivan, of Osgood, Indiana. He writes:

Extended BASIC (TI version 110) will not permit NEW as a program statement. The following is an equivalent way of producing the NEW function:

CALL INIT::CALL CLEAR::CALL LO AD(-31592,255,231,255,231)::END

# Revisiting retirement calculations

This comes from Owen Mayer, of Hoffman Estates, Illinois. He writes:

I have run the program Computing retirement income in the December 1988 issue and although my retirement situation may be lousy, there are two errors in line 260 that make it needlessly grave. I am listing a correction to this line below and I have checked the results and believe they are more accurate.

260 FUTURE=INT(((B\*(1+RATE)^YE ARS+(ADD\*((1+RATE)^YEARS-1)/R

ATE))\*RATE)/12+.5)

## **MULTICOL** changes

This comes from Ralph Mills, of Selkirk, Manitoba. He writes:

Since writing to you about the problems I had experienced with the MULTICOL program (Jan., Feb. 1988), necessity demanded that I make the whole program work properly. After my suggested changes (User Notes, June 1988), the program still would not repeat a page properly: It reloaded the file, mixing the first and second readings in the array B\$(I). In addition, the pagination was messed up.

The latest changes, I think, achieve what the program was intended to accomplish. The changes are listed below.

840 IF S\$="Y" THEN 850 ELSE 600 Change statement 780 to:

780 IF S\$="N" THEN 782 ELSE 786 And add statements 355, 782, 784 and 786:

355 S\$="N"

782 IF C\$="Y" THEN PRINT #1:TAB (YY);"PAGE ";A ::PRINT #1: : : 784 GOTO 790

786 IF C\$="Y" THEN PRINT #1:TAB(
YY);"PAGE ";A+1::A=A+1::PRINT #1:
. :

While the above changes may be less than elegant, they work and accomplish what I think the program is intended to do. I hope this additional information will prove useful to other readers.

# Garbled output from the formatter

This comes from Jim Peterson, of Tigercub software in Columbus, Ohio. He writes:

In reference to the asterisk problem discussed in the February Feedback, the asterisk is not the only reason why so many program listings published in newsletters are garbled as a result of having been printed through the TI-Writer Formatter.

Try printing this routine through the formatter and see why:

100 A=A\*264: @=1 110 PRINT "1 . . . 2 . . . 3 . . . 4 . . . 5 . . . 6" (this line must begin with a period)  $120 \text{ M}=M$\&A$\&B$\&C$ :: K=K^3$ 

The 26 will disappear, the @ will disappear, the =1 will be double-struck, the second line of the print statement will disappear, the ampersands will disappear, A\$B\$C\$ will be underlined, and the caret will disappear! See the example below:

1000 A=A4 :: =1

Here is how to avoid such errors. Before merging a listed program into a file, load it into the Editor. Position the cursor at the beginning of the first line, hit FCTN 9, type RS and Enter, then  $\frac{8}{1}$  and Enter. At the prompt, thype A. When finished, get the cursor back to the beginning, and repeat the above with  $\frac{8}{1}$ , then  $\frac{1}{1}$  and then  $\frac{1}{1}$ 

Now, use FCTN 8 to open 5 lines at the beginning and add this transliteration:

.TL 92:46

.TL 123:64

.TL 124:42

.TL 125:38

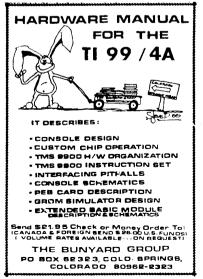
.TL 126:94

Save the result, go back to the Formatter and try it again.

## TI Base autoload

This comes from Andrew Bender, of Austin, Texas. He writes:

TI Base has an annoying habit of mak-(See Page 46)



## User Nates

#### (Continued from Page 45)

ing you type in the name of the program to load it. With this simple modification, TI Base can now be loaded into Editor/Assembler while pressing only two keys: 5 (for option 5) and Enter at the filename prompt (in otherwords, UTIL1).

The steps are easy to follow:

- 1. On a backup copy of TI Base, copy TIBASEP onto the disk, giving it the name UTIL1.
- **2.** Using a sector editor, find the third sector of UTIL1.
- **3.** Look for the string TIBASE on the sector. It will occur after the string "enter Drive #."
- **4.** Change TIBASE to UTIL1 and space over the E that remains from TIBASE.
  - 5. Save the sector to the disk.

Now, all you need do to load TI Base is to select Option 5 and press enter from the Editor/Assembler menu. The computer will automatically load it from there.

## Spice up prompts

This program has appeared in several user group newsletters. It is by Ollie Hebert.

Users of this program can incorporate it

into their menus to add a little spice to the input prompt. As outputted below, it will cause the question mark prompt used in this program to "bounce" while waiting for input.

150 DISPLAY ERASE ALL :: CAL L CHARPAT(63,C\$):: CALL CHAR (64,SEG\$(C\$,3,14))!194 300 DISPLAY AT(4,3):"SELECT FROM THESE ITEMS: " :: FOR I= 1 TO 4 :: DISPLAY AT(1\*2+7.8 ):CHR\$(1+64);": PROCESS #"; CHR\$(1+48):: NEXT | !179 310 DISPLAY AT(17,8)BEEP: "E: QUIT": : : :" YOUR CHOIL CE (A-E) ?" :: GOSUB 10000 :: ON X-64 GOTO 1000.2000.30 ØØ.4ØØØ.5ØØØ !2Ø3 1000 PRINT X-64 :: GOTO 5000 1086 2000 PRINT X-64 :: GOTO 5000 1086 3000 PRINT X-64 :: GOTO 5000 !Ø86 4000 PRINT X-64 :: GOTO 5000 !Ø86 5000 END !139 10000 Z=64+(Z=64):: DISPLAY AT(21,24): CHR\$(Z):: CALL KEY ! 194

10010 IF X<65 OR X>69 THEN C ALL SOUND(200,220,0):: GOTO 10000 ELSE CALL SOUND(200,14 00,0):: DISPLAY AT(21,24):CH R\$(X):: RETURN !039

If you'd rather use color to enhance the effect, substitute the lines below for 150 and 10000

15Ø DISPLAY ERASE ALL :: CAL L CHARPAT(63,C\$):: CALL COLO R(14,12,1):: CALL CHAR(143,C \$)!175 1ØØØØ Z=143+8Ø\*(Z=143):: DIS PLAY AT(21,24):CHR\$(Z):: CAL L KEY(3,X,Y):: IF Y=Ø THEN 1 ØØØØ !Ø21

User Notes are is a column of tips and ideas designed to help readers put their computers to better use. The information provided here comes from many sources, including TI user group newsletters, bulletin board services and MICROpendium readers. MICROpendium pays \$10 for any item sent in by readers that appears in this column. Mail User Notes to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

### **1989 TI FAIRS**

(3,X,Y):: IF Y=Ø THEN 1ØØØØ

#### **FEBRUARY**

**T1-Fest West '89,** Feb. 18-19, Clarion Hotel at Balboa Park, San Diego, California. For information, write T1-Fest West c/o Southern California Computer Group, PO. Box 21181, El Cajon, CA 92021 or call the SCCG BBS, (619) 278-7155, and leave a private message to the sysop with your full name and address.

#### MARCH

West Coast Computer Fair, March 17-19, Brooks Hall. San Francisco. San Francisco 99ers to be at Booth 733. For further information, write San Francisco 99ers, 248l6 Mango St., Hayward CA 94545.

TICOFF (TI Computer Owners Fun Faire), March 18, Roselle Park High School, Roselle Park, New Jersey. For information, write TICOFF'89 c/o Roselle Park High School, 185 West Webster Ave., Roselle Park, NJ 07204, or call Robert Guellnitz at (201) 241-4550 or (201) 382-5963 or the TICOFF BBS, (201) 241-8902.

#### **APRIL**

Fourth Annual New England TI Fayuh, 10 a.m.-5 p.m. April 1, Ramada Inn of IH95 in Woburn, Massachusetts. For information, contact the Boston Computer Society TI99/4A User Group, One Center Plaza, Boston MA 02108.

Alberta TI-Orphan Reunion, April 29 at Innisfail Country Lodge, Innisfail, Alberta, Canada. Fór information, contact Fred Kessler, Box 20, Sundre. Alberta, Canada T0M 1X0 or (403) 638-3916.

4th Annual Ottawa TI-FEST, April 29 at Merivale High School in Nepean, Ontario, Canada. For information, contact Jane Laflamme, 5480 Canotek Rd. Unit #10, Gloucester, Ontario, Canada KlJ 9H6 or (613) 745-2225.

#### MAY

Multi User Group Conference May 20, Reed Hall/Student Activities Building,

Ohio State University, Lima, Ohio, For further information write Lima Users Group, P.O. Box 647, Venedocia, OH 45894, or call Dave Szipple evenings at (419) 228-7109.

#### JUNE

TI99/4A Users Group (.U.K.) Annual Meeting June 17 in Romley, England. For information, contact Stephen Shaw. 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

#### **OCTOBER**

Australia Tl Fair, 2-6 p.m. Oct. 14, Pavilion, Deepdene Park, Whitehorse Rd., Deepdene, Australia. For information contact Tl99/4A Users Group — Melbourne Inc., 88 Main St., Blackburn, Victoria 3130, Australia.

**3rd International TI-Users Meeting.** 10 a.m.-6 p.m. Oct. 15 at Jugenderherberge Duisberg Wedau, Kalkweg 148, 4100 Duisberg 48, West Germany, For information contact TI-99er Workshop Rheinland, Dept. Allgemein & Software, c/o Mike Heuser, Karl-Marx-Allee 18, 5000 Cologne 7I, West Germany, or the organizing committee at PCC, TI-Service, c/o Hans Greiffenberg, Großglocknerstr. 45, D-4100 Duisberg 28., West Germany.

Third Annual CPUG Computer Expo, 7 a.m.-2 p.m. Oct. 15 at Carlisle Fairgrounds on Clay Street in Carlisle. Pennsylvania. Sponsored by Central Pennsylvania 99/4A Users Group, co-sponsored by Cumberland County Amateur Radio Service and 6th Annual Cumberland County Hamfest. For information, contact Central Pennsylvania 99/4A Users Group. P.O. Box 14126, Harrisburg, PA 17104-0126 or the WIZ/TIB BBS. (717) 657-4992 or 657-4997.

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. Events will remain listed throughout the year.

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