Covering the TI99/4A and the Myarc 9640

MICAOpendium

\$2.50 Volume 6 Number 12 January 1990



Getting music onto a program Page 31

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*READ THIS

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

1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation 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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ANNOUNCING

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Comments

HFDC owners need V1.29 of MDM5

I don't want anyone to get me wrong: I like the Geneve 9640. The past couple of issues I've taken Myarc to task for not getting Geneve software out to users and for spending too much time developing hardware rather than concentrating on hardware. I still feel that way about the software issue but I want to emphasize that I continue to think the Geneve is a wonderful piece of hardware. It's now time to see some wonderful software to go along with it.

Myarc Advanced BASIC, of course, is a step in the right direction. The current version is 2.99A, and according to Myarc's Lou Phillips, it is all but final. Phillips told MICROpendium earlier this month that Advanced BASIC, MDOS 1.14F and MDOS 0.97h were virtually finished, though of the three the only one I haven't seen on the boards is 0.97h. The latest version I've got is 0.96h..As of early January, he said, the company was preparing a software mailout to registered buyers. Advanced BASIC is a nifty version of BASIC that is several notches ahead of TI Extended BASIC. I have used it only for relatively simple applications, but I like what I've seen from it. However, because it is still in V2.99, one can't assume that it is completely debugged. The same still holds true for MDOS.

Despite this, I'm glad I bought a Geneve and use it nearly every day.

Incidentally, because of the number of orders I'm getting for free updates of Geneve software, I'm going to formalize the proceedings a bit. You'll find an article about it elsewhere in this issue. I'm doing this primarily to help Geneve users who don't have modems. And let me say, there are quite a few of them.

VERSION 1.29 of MDM5 DOES BACKUPS

Thanks to Jesse Slicer for putting me onto V1.29 of MDM5 (some say MDMV). This version of the Myarc Disk Manager supports the backup function with the Hard and Floppy Disk Controller. Make sure that you have the version 11 or higher EPROM. Last month I complained about not being able to do backups, but I was using V1.28.

THANKS FOR THE CHRISTMAS CARDS

MICROpendium readers are wonderful. This year as in years past we received a bunch of Christmas cards, and we want you to know that we put all of them on the mantelpiece. Thanks for sharing your holiday cheer with us.

ONE MORE COMMENT ON THE GENEVE

There is a debate currently going on about alternative operating systems for the Geneve. Some users seem to want a system capable of serious multi-tasking and other exotic functions. Comparisons are to the OS2 system by IBM and the Macintosh System 7, which hasn't been released yet. Both of these systems require megabytes of memory just to be loaded so you'd need a minimum of four megabytes or so to actually use the computer. Thanks, but no thanks. Memory isn't cheap, and multi-tasking is little more than a convenience for the vast majority of computer users. The market for such extravagant, memory hogging operating systems is limited to business. I doubt whether anyone wants to pay the price for

a similar application on the Geneve.

There are plenty of technical points about MDOS that could stand some refining, but that's true for any operating on an machine. There is no perfect operating system any more than there is a perfect computer. I would just like to see the existing finalized so software developers can rely on it as a standard for software development.

IT'S BEEN A LONG TIME

It's hard to believe, but next month will mark the start of our seventh year publishing MICROpendium. A lot of our readers have been with us since day one and we are grateful. We hope to continue to earn your loyalty in 1990 and years beyond.

USER SUPPORTED SOFTWARE UPDATE

40-COLUMN UTILITIES (V2.3)

This is an update of a package reviewed in the June 1989 MICROpendium. It requires a disk system and memory expansion. The package allows the use of a 40-column screen from Extended BASIC. However, both 32- and 40-column screens remain in memory. Either may be displayed instantly. One screen may be written to while the other is displayed. All the the TI's commands are still available.

Enhancements from V2.1 include: graphics screen dump; expanded documentation; GPLLNK and DSRLNK available for use with assembly programs; SCROLL in four directions instead of one; improvements to existing commands.

The package consists of two disks. Send \$6.50, a mailer and postage to: Brad Snyder, 148 Avenue A, Palmerton, PA 18071. Those with V2.1 may upgrade by sending the author \$4.

MULTI-COLUMN PLUS

This program allows you to create multi-column text files and output them to a printer. It requires Extended BASIC, memory expansion, disk system and a printer. The program allows you to set page length, margins (top, bottom, left and right), type styles and fonts.

Send disk, mailer and postage to: Bill Harms, 6527 Hayes Court, Chino, CA 91710. A \$6.50 donation is requested if you use the program.

CLASS

Create letters and special shapes for signs, flyers, math., art, etc. Enables screen and printout placement of letters and shapes anywhere of any size. Does polygons, rectangles, other shapes, borders, etc. based on coordinates. Compatible with TI-Artist. Requires Super Extended BASIC, disk system and memory expansion. Printer and joystick recommended.

Send \$10 to Bill Harms, 6527 Hayes Court, Chino, CA 91710.

User Supported Software is software written and distributed by the author. The list of available software is updated periodically. The complete list is available from MICROpendium for \$2. Authors who want to include their software in this list may send it to MICROpendium.

THE GENEVE 9640 HAS LANDE

You will recognize it by its trade mark, a graceful gray swan swimming on blue water, an apt symbol. The ugly duckling TI no longer wanted, is no ugly duckling ar 100% Compatible:

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K No Wait State High Speed RAM:

— Programs like MultiPlan, which are painfully slow on the 99/4A, run many lames faster, thinks in party the High Speed RAM.

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• Near 100% Compatible:

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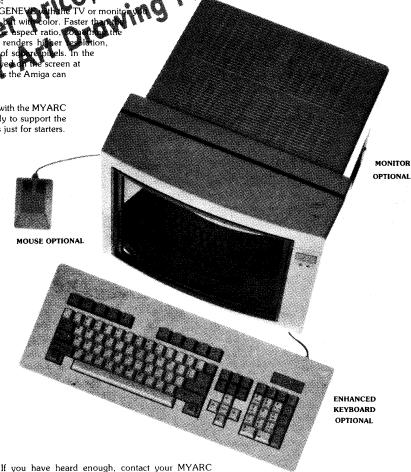
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- 6 Complet Included WithThe GENEVE. But, three you will not be able to see how you ever did without are:
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 - Advanced Basic; the best and most powerful basic on the market today.
 - Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.

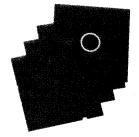






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Feedback

Where to get cables

I am dashing this off to make a fast response to the December '89 article about monitors.

For your info, TI type cables are available from All Electronics Corp., P.O. Box 567, Van Nuys, CA 91408, Part #DIN-RCA.

The same place also has keyboards, modulators, power transformers and power supply boards.

I recommend that users pick up spares for these. I have lost three keyboards, with another about to go, also two power supply boards. Maybe I am too hard on keyboards.

> Merle Vogt Von Ormy, Texas

Geneve TPA hailed

My vote for a good program that can be learned in a short time without being a hacker is Mike McCann's Printers Apprentice for the Geneve (MDOS version). It takes little time and with some practice anyone can use it. True, if you are a hacker many extra things can be done with this fine program, but to learn the basics is easy.

On the other hand, a program I found difficult to learn was the original Printers Apprentice for the 99/4A. Not seeing what you are doing onscreen is hard to understand and cumbersome.

Gary Kuehn Pittsburgh, Pennsylvania

Expansion questions

I have a fairly "complete" system which includes: TI99/4A console with Extended BASIC (TIW, E/A), etc.; CorComp 9900 Micro-Expansion System; TI Speech Synthesizer; two 5.25 IEC disk drives; Epson LX-800 9-pin printer; ATD 1200 baud modem; 13" Sylvania TV set (used as a monitor); TI PHP-1100 remote controllers.

I find now that the Micro-Expansion System limits the expansion and utilization of newer developments such as hard drives and half-height drives.

One of my friends has offered to swap me a PEB with a RS-232 card and 32K memory expansion card plus \$100 in cash for the Micro-Expansion System. This would still leave me without a controller card for the disk drives. After reading your article (October 1989), it would seem desirable to go to half-height drives as well. Is there a controller card that will control half-height and full-height drives as well as a hard drive? You mentioned the Myarc hard and floppy disk controller — can this control four floppy drives plus a hard card (two half-height drives plus two full-height drives plus a hard drive)? The IEC full-height drives have their own power supplies. Can the Myarc drive this combination?

George O. Dick Pittsburgh, Pennsylvania

The Myarc Hard & Floppy Disk Controller will control up to four floppy disks drives and up to three hard disk drives. As it comes from the factory, it will handle disk formats from single-sided single-density to double-sided double-density. With the addition of an 80-track EPROM, it will also handle 720K 3.5-inch drives.

If you don't intend to purchase a hard disk drive, you can purchase a CorComp or Myarc floppy disk controller card. These will handle up to four 5.25-inch floppy disk drives in formats ranging from SSSD to DSDD.

As for half- versus full-height drives, this refers to the physical size of the drive. Half-height 5.25-inch drives are about half the width of a bulky full-height drive. In most cases, if you have a choice between a half-height or a full-height drive, take the half-height.

Except for the floppy drive that fits into the Peripheral Expansion Box, any drive will have to have its own power supply. It doesn't matter which controller you use in this regard.—Ed.

Backup for hard disks

I can't agree more with the December 1989 editorial on the need for a backup system for hard disks. I too find the individual file COPYing to be an inconvenient alternative. What really makes it tough, though, is the fact that MDM5 doesn't show the cumulative amount of sectors of all files to be copied (the way DM1000 does). Many times I find I will mark a group of files for backup only to discover

their combined size exceeds the capacity of my floppy disk. Sure would be nice to have a "cumulative-sectors" total displayed when Backup or Copy is selected. If that feature exists, I haven't found it, and would appreciate a clue as to its availability.

Another problem not addressed in the editorial is files larger than the maximum capacity of a floppy. I have what may be the largest TI99 data base in captivity (almost 8,000 records), that consumes more than 3,200 sectors on the hard disk in the TI-Base version and even more than that in the FirstBase version, that I can't back up at all. Both data bases just sit out there on my hard disk, unprotected from the perils of power surges, head crashes and the like. I sure would like to have some way to back them up, because I'll never be able (or willing) to duplicate them if destroyed.

Bill Gaskill Grand Junction, Colorado

Try MDM5 v1.29 to back up your hard disk. Make sure you have EPROM No. 11 or higher. Earlier versions of MDM5 couldn't be used. Also, take note of the date and name you give the backup. They are required to restore the files to the hard disk.

Hard drive questions

I own a TI99/4A home computer with one floppy disk drive and 32K card within the PEB. My Extended BASIC cartridge is driving me crazy from so many system lockups. I tried cleaning the contacts as noted in your previous issues and it seems to work for a while. I recently attended a TI99/4A fair in Carlisle, Pennsylvania, where I spotted a five MEG hard drive for sale. Can you tell me if any suppliers have these drives as well as 10 MEG drives with their guarantees? I'm thinking of starting a little business and do not need a 20 or 30 MEG hard drive at this time. If I do purchase one of these drives, how hard is it to update them to more MEGs?

I am thinking of putting all my modules on the hard drive and use the one floppy drive as my data source. This way I won't have to worry about using any cartridges ever again. Also, I'll need a controller for the hard and floppy drives. Can you tell me

(See Page 9)

Feedback

(Continued from Page 8) what all this would cost and entails?

Anthony J. Serio Staten Island, New York

First of all, you can't upgrade or increase the capacity of a hard drive. What you buy is what you get. A 10-megabyte drive will always be a 10-megabyte drive, and so on. — Ed.

$5\frac{1}{2}$ years with 4A at 9

I got my TI99/4 on my 3½th birthday. I've been using it ever since and really added on to it. I think the 99/4A is one of the best computers. Though it might not be very powerful, if you use it in just the right ways it can seem like an IBM or an Apple.

Yesterday I got my first issue of MICROpendium. I read it all the way to the doctor's office (I had to have an allergy shot that day). It was love at first byte (heh-heh)!

Anyway, I just wanted you to know that even 9-year-old fourth-graders read MI-CROpendium. Please publish more good stuff.

Andrew Davis St. Cloud, Minnesota

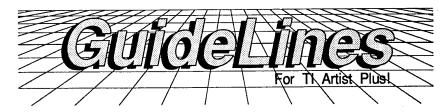
Installing drive

Concerning the letter in your December issue from Michael G. Mickelsen of the Windy City 99 Club and how he installed a 3.5-inch drive on his 99/4A, let me tell you what I did. I purchased two half-height Mitsubishi 720K AT drives at \$69.95 each (they can be purchased cheaper through *Computer Shopper*). They are the same size as the half height 5.75-inch drives and fit perfectly in my PEB.

No modification was required other than having them operate as drives No. 1 and No. 2. The existing wiring and cable for my previous drives was used to connect the 3.5-inch drives.

This was no great discovery on my part, as I was told by a multitude of persons that this could be done. If you want only one 3.5 external drive, you can purchase the necessary items (drive and case w/power) for approximately \$100 from ads in the *Computer Shopper*.

Ted Halkyard Alexandria, Virginia



Banner Borders, Templates, Fonts, Instances and More!

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GuideLines Complete Only \$9.95



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TI Artist PLUS! is also the most compatible program available. It works with almost any printer, including a few color printers. Its backwards compatible with all of the existing artwork available for the original TI Artist. And its compatible with the Geneve 9640 (in GPL mode), most RAMdisks, and the Myarc HFDC. (Please contact us regarding specific product compatibility).

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BASIC

A walking tour of Tucson

By REGENA

Last year for TI FEST-WEST '89, I wrote a program with a San Diego map. It showed many of the tourist attractions in the San Diego area — places to visit while we were visiting San Diego for the annual TI FEST-WEST. At that meeting, it was decided to try to hold TI FEST-WEST '90 in Tucson, Arizona, if possible. The SouthWest Ninety-Niners User Group has been working hard to make it a reality — and TI FEST-WEST '90 will be in Tucson Feb. 17-18.

Several of the committee members have been sending me brochures and information trying to show me how much really is going on in Tucson (and

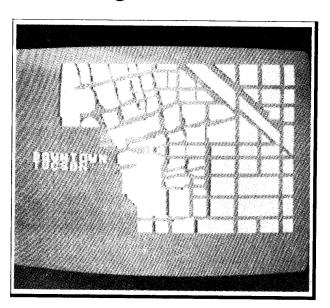
they wanted a similar computer program). I have never been to Tucson, so I really am looking forward to attending FEST-WEST. I hope many of you MICROpendium readers will also be able to attend. There really are a lot of other attractions in the Tucson area, too, and I had a hard time putting together a program.

An area map of Tucson could show many sites — Titan Missile Museum and the Pima Air Museum, Saguaro National Monument, the Arizona-Sonora Desert Museum, Kitt Peak National Observatory, Tombstone (OK Corral), Tubac arts community, Bisbee mining town, Mission San Xavier del Bac, Mt. Lemmon, Colossal Cave, University of Arizona, golfing, shopping malls and Nogales, Mexico (about 60 miles away). I wasn't sure how to fit these into a program.

I finally decided on a program showing a map of the downtown area and a walking tour of some of the interesting areas there. This information is from the "Tucson Official Visitors Guide." I couldn't possibly fit everything in and include the surrounding tourist attractions, so you'll just have to visit Tucson in person:

Utah cities are generally laid out in nice square or rectangular city blocks, especially in the downtown areas. A nice grid pattern of city blocks is much easier to put on a computer screen — especially one like our TI with 8-by-8 squares within rows and columns. However, Tucson has a main diagonal street (and not exactly 45 degrees), then nearly all irregular blocks and streets at many angles. What you'll see on the screen is an approximation of those "blocks," and it took lots of memory to define characters (up to number 159) to draw the map. With a higher resolution I could get straighter lines, but with our TI method of graphics, the lines are jagged.

The actual recommended walking tour suggests 44 places, but I used only part of the map and 35 places. Printing a short description of each place also takes memory, but I finally fit 35 places



in (by abbreviating "Avenue" and "Street," using DATA statements to define characters, combining PRINT statements, and leaving out all REMark statements).

A map will be shown on the screen. When the program first starts, an asterisk will be blinking at the beginning point of the walking tour — Day's Inn Downtown, the site of TI-FEST-WEST '90. You may press the ENTER key to read a little more about this place. When you press any key to continue, the map reappears, and the asterisk automatically moves to the next place of interest on the tour. If you wish to skip over some places, use the right arrow key

(on the D key) to go to the next site. Each time you press the arrow key, the asterisk moves to the next place on the tour. If you want to back up or look at a previous site, press the left arrow key (on the S key). Any time you want to read about a particular location, press the ENTER key.

EXPLANATION OF THE PROGRAM

Line 100 DIMensions variables X and Y for 35 (0 through 34) row and column coordinates used in moving the asterisk. Lines 110-410 print the instruction screen while defining characters and colors. Lines 130-160 define graphic characters, and the DATA statements in Lines 170-290 have a character number and character definition for 17 characters which will be used in the map. Lines 220-250 define graphic characters also, but C is used for the character number from 96 to 159, and the DATA statements in Lines 260-360 contain the character definitions for each of those characters. These take about 15 seconds to define.

Lines 370-390 define the X and Y coordinates for each site on the tour. The data in Lines 360, 400 and 410 are row and column numbers in pairs for each of the 35 sites. If you get any error messages when you try to run this program, the most likely cause is a typing error in the DATA statements.

Lines 420-440 wait for the user to press the ENTER key to start the program. Line 450 clears the screen, then Lines 460-510 define more graphics characters, the screen color as dark blue and the character colors as white. Line 520 initializes the variable C at zero for the first site on the tour.

Line 530 clears the screen, and Lines 540-800 print the map on the screen row by row. Notice that the PRINT statements print the characters which have been redefined for the map. When you are typing these, switch the alpha lock off so you can get "Towercase"

(See Page 11)

REGENA ON BASIC —

(Continued from Page 10)

letters. Some of the symbols require the FCTN key. If the map really looks funny, the error could be in typing these statements or in typing the DATA statements that defined the graphics.

Line 810 uses CALL GCHAR to determine what character is originally on the screen at a certain position. Lines 820-850 blink the asterisk at the position by alternating the asterisk with the original graphic character G while waiting for a key to be pressed. Lines 860-900 increment the value of C if the right arrow key is pressed. Lines 910-950 decrease the value of C if the left arrow key is pressed.

Lines 960-1060 contain the procedure if the ENTER key is pressed. The screen clears and the program goes to a subroutine depending on the value of C. The subroutine PRINTs the information. Lines 1020-1040 wait for the user to press any key to continue the program. When a key is pressed, Line 1050 increments

C, and Line 1060 brances appropriately to redraw the map. Lines 1070-2410 contain the subroutines for the information to be printed about each site.

Remember this is a full-memory program, so you must use this procedure before typing in or loading this program:

CALL FILES(1) NEW (ENTER) (ENTER)

Also remember, the programs in MICROpendium have been put through a checksum program (see notes on Table of Contents page), and you do NOT type the ! and numbers at the end of each line.

If you wish to save typing effort, you may have a copy of this program by sending \$4 to REGENA, 918 Cedar Knolls West, Cedar City UT 84720. Be sure to specify that you need the TI version of "Tucson," and whether you want cassette or diskette.

TUSCON

100 DIM X(34),Y(34)!042 110 CALL CLEAR !209 120 PRINT " WALKING TOUR OF TUCSON" !227 130 FOR S=1 TO 17 !122 140 READ C.C\$!244 15Ø CALL CHAR(C,C\$)!Ø81 160 NEXT S !233 17Ø DATA 33,ØØØE7E7E7EØE,3 5.7F3F1FØFØ783C1E.36.43Ø3ØØØ ØØØØØØ1.37.FØF8FCFEFFCE.38. Ø3Ø1ØØØØØØØØØØØ !245 180 DATA 40.000000000C3C3C3C3 ,41,000000E0FFFFFFF,43,0000 ØØØØØFØFØFØF,47,Ø3Ø3Ø3Ø3Ø3Ø3 Ø3Ø3,61,83C1EØF,63,3F3F3F3F !117 190 DATA 58.83C1C0C0C0C0CCCC3 ,59,0080C0E0F0F0F0F,64,C3C3C 3C3,91,0381CØEØFØF8FCFF,93.0 ØØØØØØØØØ3Ø3Ø3Ø3,94,FØFØFØF ! 189 200 PRINT : : "TAKE A WALK IN DOWNTOWN": "TUCSON, ARIZONA. ": :"USE THE RIGHT ARROW KEY ":"TO GO TO THE NEXT POINT" 1071 210 PRINT "OF INTEREST.": :" USE THE LEFT ARROW KEY": "TO BACK UP.": :"PRESS (ENTER) T O READ ABOUT THE SITE.": :: : ! Ø47 22Ø FOR C=96 TO 159 !225 230 READ C\$!254

240 CALL CHAR(C,C\$)!081

25Ø NEXT C !217 FØFØFØFØFØFØF, FFFFØØØØØØØØFF FF, ØFØFØFØFØFØFØF, ØØØØØØØØ FFFFFFFF, FFFFFFFF !Ø57 27Ø DATA 7F3F1FØFØ7Ø3Ø1,ØØ8Ø CØEØFØF8FCFE,ØØØØØØØØFØFØFØF ,FØFØØØØØØØØØFØF,C3C3C3C3C3C 3C3C3,C3C3ØØØØØØØØC3C3 !Ø6Ø 28Ø DATA 3F3F3F3F3F3F3F,ØF ØFØFØF,8F8FC7C7E3E3F1F1,F1F1 F9F8F8FCFCFC,FEFFFFFFFFFFEFØC .0080800008 !094 290 DATA FOFOFOFOFEFEFEFE, FF 7F7F3F3F3F3F3F,7F7F7F3E3,FEF 8CØØØØØØØØØØØØØØØØE3E3F 1F.0000073F3F1F1F1F !219 300 DATA 07C7C3C3E3E1E1E1,FC FEFEFCFØCØCØE.FE7ØØØØØØØØØØØ 7F,ØØØØØØØØØØ71F1FØF,ØØØ11FFF FFFFFFFF, 1F1F1FØFØFØFØ7Ø7 !2 Ø1 310 DATA 1F1F8F8F8FCFC78,EØE ØEØFØFØF,3F3F3F3F,ØØ2Ø3Ø38,Ø Ø1,0080C3C3E3E1C18 !135 320 DATA 0063E3E1F1F0C,1CFCF CF88ØØØØE7F,FFFFFF7F3F1FØFØ7 ,7E38ØØØØØØØØ33F3F,ØØØØØØ1CFC FCFEFE, ØØØØ1C3C3C3C3 ! 144 33Ø DATA Ø7Ø7Ø3838Ø8Ø8,ØØØØØ ØØØ43C3E3E3.ØØØØØØØØØØFØFØFØF ,EØCØ8,ØCFCFCF8C,ØØØ1Ø3Ø3838 18181,E3E3E3E1E1E1E1E !248 340 DATA 01070F1F1F3F3F3F,C0 FØF8FCFEFEFFFF.Ø7Ø7Ø7Ø7Ø3Ø3Ø

101.0700000000000073F,0000000 ØØF7FFFFF,8Ø8Ø8ØCØCØCØEØE !2 350 DATA FFFFCE, EØ80000000 ØØC7C.FFFCF8F8F8F8F8FC.1F1F1 F180000010F,FFF00000000FFFFF .3F3CØØØØØØØØFØFF !227 360 DATA 1818181818181818,00 FØFEFEFCFCF8, 13, 23, 13, 21, 1 5, 19, 12, 18, 14, 17, 13, 16, 11, 16 .10.16.8.14,8,15 !151 37Ø FOR C=Ø TO 34 !1Ø4 380 READ X(C).Y(C)!091 39Ø NEXT C !217 400 DATA 8,16,6,16,6,15,5,15 ,3,14,2,13,2,11,4,12,5,13,6, 14,7,15,7,14,7,13,7,8,10,13, 10,11,14,14 !000 41Ø DATA 15,16,20,17,15,24,1 3,25,11,28,10,28,7,26,11,20 !215 420 PRINT : : : "PRESS < ENTER > TO START." !221 43Ø CALL KEY(Ø,K,S)!187 440 IF K<>13 THEN 430 !164 450 CALL CLEAR !209 460 CALL CHAR(60,"F0F0F07030 1")!ØØ6 470 CALL CHAR(62,"C3C3C3C3") ! 128 480 CALL SCREEN(5)!150 490 FOR C=1 TO 16 !105 500 CALL COLOR(C, 16, 1)!042 510 NEXT C !217 52Ø C=Ø !25Ø (See Page 12)

REGENA ON BASIC—

(Continued from Page 11) 530 CALL CLEAR !209 540 PRINT " `no`o`oopgee" ;CHR\$(13Ø);"f`gf`c`j`a`" !ØØ 550 PRINT " `orsptuvwx`lc gf`gfc`j`a`" !232 560 PRINT " `yz{¦x`}~";сн R\$(127);"e";CHR\$(128);"me";C HR\$(129);"f'g";CHR\$(131);"bkbib" !208 570 L\$=CHR\$(132)&CHR\$(133)&C HR\$(134)!141 58Ø PRINT " ```x`o`";L\$;" }`c`lgf`";CHR\$(13Ø);"fj`a`" 1092 590 L\$=CHR\$(135)&CHR\$(112)&C HR\$(136)&CHR\$(137)&CHR\$(138) &"" CHR\$(139)&CHR\$(117)&CHR \$(140)!079 6ØØ PRINT " ```a";L\$;"dd" ;CHR\$(141);"d#cg\$bib" !Ø82 610 L\$=CHR\$(142)&CHR\$(123)&C HR\$(137)&CHR\$(125)&"p"&CHR\$(143)&"u"&CHR\$(144)&"`"&CHR\$(145)!2Ø8 62Ø PRINT " ``e";L\$;"``c` %%";CHR\$(135);"gca\" !231 630 L\$=CHR\$(146)&CHR\$(147)&C HR\$(148)&"p"&CHR\$(149)&CHR\$(150)&"; "&CHR\$(151)&" "&CHR\$ (127)!070 640 PRINT " 1";L\$;"tu";C HR\$(149); CHR\$(150); "c[":CHR \$(135);"g b" !113 650 L\$=CHR\$(152)&CHR\$(153)&C HR\$(136)&CHR\$(137)!244 660 PRINT TAB(10);"; "); L\$; "s`l``c`:";CHR\$(135);";`" !1 13 670 L\$=CHR\$(154)&CHR\$(149)&C HR\$(15Ø)!15Ø 68Ø PRINT TAB(1Ø);"}";L\$;"!p m";CHR\$(152);"?emeeme>=<`"! 200 690 L\$=CHR\$(157)&" "&CHR\$(15 8)!221 700 PRINT TAB(11);"u";L\$;"!c `1`/``c`j`a#" !127 710 PRINT " DOWNTOWN ''':C HR\$(159);"+d+d]dd+d(dhd"!19 6 720 L\$=CHR\$(155)&CHR\$(156)&C HR\$(155)&CHR\$(156)!252 730 PRINT " TUCSON ";CHR\$(136);CHR\$(15Ø);"\`a";L\$;"/\

c'j'a'" !001 740 PRINT TAB(11);"c''a":CH R\$(156); "dhb]dd+dddhd" !240 750 PRINT TAB(11);"c'``ateib /``c```a`" !121 76Ø PRINT TAB(11);"m'''c'ae @eemeee^e" !157 770 PRINT TAB(12);"f'''c'a'j ``c``a`" !Ø54 780 PRINT TAB(13);"''c'a'j' `c```a`" !2Ø8 79Ø PRINT TAB(13); "bibkd!+)d d+d(dhd" !Ø57 800 PRINT TAB(13);"'a'j''c'' `c`j`a`": : :!174 810 CALL GCHAR(X(C),Y(C),G)! 250 820 CALL KEY(0,K,S)!187 830 CALL HCHAR(X(C),Y(C),42)!228 840 CALL HCHAR(X(C),Y(C),G)! 251 85Ø IF S<1 THEN 82Ø !Ø64 86Ø IF (K=68)+(K=100)+(K=9)<>-1 THEN 910 !067 87Ø C=C+1 !255 88Ø IF C<35 THEN 81Ø !Ø94 89Ø C=Ø !25Ø 900 GOTO 810 !124 91Ø IF (K=83)+(K=115)+(K=8)< >-1 THEN 96Ø !119 920 C=C-1 !000 930 IF C>=0 THEN 810 !228 940 C=34 !050 95Ø GOTO 81Ø !124 960 IF K<>13 THEN 820 1044 97Ø CALL CLEAR !2Ø9 98Ø IF C>17 THEN 1010 1039 99Ø ON C+1 GOSUB 107Ø,110Ø,1 130,1160,1200,1240,1280.1330 .1370,1400,1450,1490,1530,15 70,1620,1670,1720,1760 !128 1000 GOTO 1020 !078 1010 ON C-17 GOSUB 1800,1840 .1880,1920,1960,2010,2050,20 80.2110,2160,2210,2260,2280. 2310,2340,2370,2390 !234 1020 PRINT : : "PRESS ANY K EY TO CONTINUE." !176 1030 CALL KEY(0,K,S)!187 1040 IF S<1 THEN 1030 !019 1050 C=C+1 !255 1060 IF C<35 THEN 530 ELSE 5 20 ! 153 1070 PRINT "DAY'S INN DOWNTO WN": :"88 EAST BROADWAY": :

:"SITE OF TI FEST-WEST '90" 1000 1080 PRINT : : "FORMERLY SANT A RITA HOTEL, BUILT IN 19Ø4 "!169 1090 RETURN !136 1100 PRINT "METROPOLITAN TUC SON": "CONVENTION AND VISITOR BUREAU": : "13Ø S. SCOT T AVE." !249 1110 PRINT : : "THIS 60-YEA R-OLD BUILDING WAS THE ORI GINAL SITE OF THETHOMAS-DAVI S CLINIC." !160 1120 RETURN ! 136 1130 PRINT "ST. AUGUSTINE CA THEDRAL": :"192 S. STONE AVE .": : : "THIS BUILDING WAS ST ARTED IN1896." !202 1140 PRINT : "ABOVE THE ENTRY IS THE": "BRONZE STATUE OF": "ST. AUGUSTINE AND SYMBOLS O FTHE ARIZONA DESERT." !130 115Ø RETURN !136 1160 PRINT "CHARLES O. BROWN HOUSE": "AND OLD ADOBE PATIO ": :"40 W. BROADWAY BLVD.": : : "THE OLD ADOBE PATIO IS" ! 2Ø2 1170 PRINT "PART OF THE BROW N HOUSE.": :"THE FIRST BROWN HOME WAS THEMEXICAN TERRITO RIAL-STYLE" !ØØ2 1180 PRINT "STRUCTURE AT THE SOUTH END OF THE PATIO FAC ING JACKSON STREET." !092 119Ø RETURN !136 1200 PRINT "SAMANIEGO HOUSE" : :"222 S. CHURCH AVE." !Ø43 1210 PRINT : : "NOW A RESTAUR ANT, THIS TYPICAL TOWNH OUSE OF THE 188ØS WAS THE RESIDENCE" !248 1220 PRINT "OF CIVIC AND POL ITICAL LEADER MARIANO G . SAMANIEGO." !125 1230 RETURN ! 136 1240 PRINT "LA PLACITA VILLA GE": : "120 W. BROADWAY BLVD. "!177 1250 PRINT : "THIS COMPLEX OF OFFICES AND SHOPS IS FASH IONED AFTER A MEXICAN MARKE TPLACE." !025 1260 PRINT : "BETWEEN 10 A.M. (See Page 13)

REGENA ON BASIC—

(Continued from Page 12) ON FRIDAYS, IT AND 3 P.M. BECOMES THE SITE OF AN OPEN -AIR FARMERS MARKET." !244 127Ø RETURN ! 136 1280 PRINT "GARCES FOOTBRIDG E" !Ø46 1290 PRINT : : "THIS BRIDGE O VER CONGRESS STREET BETWEE GRANADA AVENU N CHURCH AND ES IS A" !209 1300 PRINT "MEMORIAL TO FRAN GARCES, AN EXPLO CISCO RER AND THE FIRST FRANCISCAN MISSIONARY" !Ø74 1310 PRINT "TO THE PIMA INDI AN VILLAGE AT THE FOOT OF S PEAK." !214 **ENTINEL** 132Ø RETURN ! 136 1330 PRINT "PIMA COUNTY GOVE RNMENTAL": "CENTER": : "130 W. CONGRESS ST." !143 1340 PRINT : : "THE HOME OF C OUNTY": "GOVERNMENT OPERATION S. THIS NEAT ROW OF BUILDING S THAT" !070 1350 PRINT "EXTENDS FOR A BL A PICTURESQUE ME OCK FACES DIAN OF INDIGENOUS VEGET ATION." !184 136Ø RETURN !136 1370 PRINT "TUCSON CITY HALL ": :"255 W. ALAMEDA ST." !10 1380 PRINT : : "THE BASE FOR CITY": "ACTIVITIES, THIS 10-S TAN STRUCTURE FACES": TORY "EL PRESIDIO PARK." !156 139Ø RETURN ! 136 1400 PRINT "EL PRESIDIO PARK ": :"IN THE 100 BLOCK OF CHU RCH AVENUE" !142 1410 PRINT : :"IN 1775, LT. COL. HUGO": "O'CONNER OF THE ROYAL": "SPANISH ARMY SELECTE D THIS" !246 1420 PRINT "SITE FOR A NEW F PRESIDIO. THIS RONTIER PARK IS THE SOUTHERN HALF OF THAT" ! 105 1430 PRINT "PRESIDIO, THE PL AZA DE LAS ARMAS." 1052 1440 RETURN ! 136 1450 PRINT "PIMA COUNTY COUR THOUSE": :"155 N. CHURCH AVE ." !Ø84

1460 PRINT : : "THIS BUILDING COMBINES": "SPANISH AND SOUT ARCHITECTURE IN HWESTERN ITS COLUMNS," !200 1470 PRINT "ARCHES, DECORATE D FACADE. TILED DOME, INTE RIOR COURT, AND FOUNTAIN." ! **Ø**98 148Ø RETURN ! 136 1490 PRINT "GOVERNOR'S CORNE R": :"177 N. CHURCH AVE." !2 1500 PRINT : : "THIS WAS THE LOCATION OF THEEXPANSIVE, ON E-STORY ADOBE HOME OF LOUIS C. HUGHES," !Ø37 1510 PRINT "GOVERNOR OF THE FROM 1893 TO 189 TERRITORY 6." !Ø31 152Ø RETURN ! 136 1530 PRINT "OLD TOWN ARTISAN S": :"186 N. MEYER AVE." !13 7 1540 PRINT : : "NOW AN ARTISA NS'": "MARKETPLACE, THE TWO F RONT ROOMS, WHICH FEATURE": "SAGUARO-RIB CEILINGS," !243 1550 PRINT "CONSTITUTE THE O ADOBE BUILT BETW RIGINAL AND 1875." !Ø88 **EEN 1862** 1560 RETURN ! 136 1570 PRINT "SOUTHWEST PARKS AND": "MONUMENTS ASSOCIATION" :"OFFICES AND BOOKSTORE": :" 221 N. COURT AVE." !Ø57 1580 PRINT : : "PROCEEDS FROM HERE ON ALL F BOOKS SOLD ACETS OF": "SOUTHWESTERN CULT URE AND" !ØØ2 1590 PRINT "NATURAL HISTORY THE NATIONAL PAR HELP FUND K SERVICE'S EDUCATIONAL AND RESEARCH" !Ø11 1600 PRINT "PROGRAMS.": : "TH E HOUSE WAS ONCE THE": "STORK 'S NEST MATERNITY WARD." !12 161Ø RETURN !136 162Ø PRINT "EL CHARRO": :"31 1 N. COURT AVE." !Ø38 163Ø PRINT : : "A CONTEMPORAR Y VERSION OF A LONGTIME FAVO RITE": "RESTAURANT, IT IS MAD E OF" !136 1640 PRINT "THE DARK STONE F ROM SENTINELPEAK.": :"IT WAS

BUILT AS A FAMILY": "HOME IN 1900 BY JULIUS FLIN," !139 1650 PRINT "A SKILLED FRENCH STONEMASON WHO WORKED ON TH E": "ST. AUGUSTINE CATHEDRAL. "!194 1660 RETURN ! 136 1670 PRINT "BETTERIDGE JEWEL ERS, LTD.": :"4Ø7 N. MEYER A VE." !127 1680 PRINT : : "BUILT IN THE ADOBE BUILDIN 188ØS, THIS THE BARRIO PR G IS PART OF ESIDIO HISTORIC" !Ø86 1690 PRINT "DISTRICT AND WAS PLACED IN THE NATIONAL REG ISTER OF" !076 1700 PRINT "HISTORIC PLACES IN 1975." !147 171Ø RETURN !136 1720 PRINT "THE OWL'S CLUB M ANSION": :"378 N. MAIN AVE." 1079 1730 PRINT : "LISTED IN THE NATIONAL": "REGISTER OF HIST ORIC PLACES, THIS ONCE GRAND GENTLEMEN'S" !110 1740 PRINT "CLUB BUILDING WA S DESIGNED IN 1901 BY HENRY TROST." !165 175Ø RETURN !136 1760 PRINT "STEINFELD HOUSE" : : "300 N. MAIN AVE." !147 1770 PRINT : : "BUILT OF BRIC K STUCCO IN": "SPANISH MISSIO N-STYLE AND DESIGNED BY NA TIONALLY-KNOWN" !Ø61 1780 PRINT "ARCHITECT HENRY TROST AT THETURN-OF-THE-CENT URY." !224 179Ø RETURN !136 1800 PRINT "SAM HUGHES HOUSE ": :"223 N. MAIN AVE.":"AT W ASHINGTON ST." !248 1810 PRINT : : "NOW A SERIES OF GARDEN": "APARTMENTS, THE HOME WAS": "SMALL WHEN HUGHES AND HIS" !248 1820 PRINT "BRIDE MOVED INTO IT IN 1864. IT WAS ENLARGED TO": "ACCOMMODATE THEIR 15":" CHILDREN." !Ø25 183Ø RETURN !136 1840 PRINT "ROMERO HOUSE": : "ON MEYER, NORTHEAST OF THE (See Page 14)

REGENA ON BASIC—

(Continued from Page 13) MUSEUM OF ART" !Ø18 1850 PRINT : : "BUILT ABOUT 1 868, IT IS PARTOF THE TUCSON MUSEUM OF ART SCHOOL." !122 1860 PRINT : : "THE HOME WAS BUILT OVER PARTOF THE ORIGIN AL PRESIDIO WALL." !25Ø 187Ø RETURN !136 1880 PRINT "LA CASA CORDOVA" : :"175 N. MEYER AVE.": : :" THIS IS BELIEVED TO BE ONE OF THE OLDEST BUILDINGS IN" ! 193 1890 PRINT "TUCSON": : "RESTO RED AS A MEXICAN": "HERITAGE MUSEUM. IT IS": "LISTED IN TH E NATIONAL" !Ø46 1900 PRINT "REGISTER OF HIST ORIC PLACES." !Ø36 191Ø RETURN ! 136 1920 PRINT "TUCSON MUSEUM OF ART": :"14Ø N. MAIN AVE.": : : "BUILT IN 1975, ITS EXHIB ITS" !214 1930 PRINT "INCLUDE CONTEMPO RARY WORKS.": : "PERMANENT OO LLECTIONS": "EMBRACE PRE-COLU MBIAN" ! 198 1940 PRINT "ARTIFACTS AND SP ANISH": "COLONIAL FURNISHINGS AND": "PAINTINGS." !235 1950 RETURN !136 1960 PRINT "FISH HOUSE": :"1 20 N. MAIN AVE." !026 1970 PRINT : : "BUILT IN 1868 ON THE SITE OFAN OLD BARRAC K, THE HOME OF MERCHANT, ENT REPRENEUR AND" !Ø52 1980 PRINT "POLITICAL REPRES EDWARD NYE FISH ENTATIVE HAS 15-FOOT HIGH-BEAMED CEIL INGS AND" !133 1990 PRINT "SAGUARO-RIB LACI NGS.": : "THIS BUILDING IS NO W THE": "TUCSON MUSEUM OF ART ":"LIBRARY." !141 2000 RETURN ! 136 2010 PRINT "THE MANNING HOUS E": :"9 W. PASEO REDONDO" !Ø Ø5 2020 PRINT : "TERRITORIAL | N STYLE, THIS BUILDING WAS BUILT IN 1900 BY LEVI HOWEL L MANNING." !159 2030 PRINT : : "FORMERLY, IT

WAS THE ELKS CLUB OF TUCSO N." !Ø17 2040 RETURN !136 2050 PRINT "FEDERAL BUILDING ": : "3Ø1 W. CONGRESS ST.": : :"THIS EIGHT-STORY EXAMPLE OF" !Ø67 2060 PRINT "MODERN TERRITORI AL DESIGN STANDS ON HUGE C YLINDRICAL CONCRETE PILLARS ."!Ø53 2070 RETURN !136 2080 PRINT "ARIZONA STATE OF FICE BUIDING": : "401 W. CONG RESS ST.": : : "THE FRONT OF THIS RAMBLING," 1073 2090 PRINT "PINK ADOBE STRUC TURE": "FEATURES A COLORFUL M OSAIC COMPOSED OF INTRICATE INLAIDTILES." !131 2100 RETURN ! 136 2110 PRINT "ARIZONA HISTORIC AL SOCIETY JOHN C. FREMONT HOUSE": :"151 S. GRANADA AVE ."!141 2120 PRINT : : "BUILT BY THE JOSE MARIA SOZAFAMILY IN THE 1850S, THE": "HOUSE BECAME T HE RESIDENCE" !231 2130 PRINT "OF THE FIFTH TER RITORIAL GOVERNOR, JOHN C . FREMONT, IN THE 1880s.": :"RESTORED BY THE TUCSON" !Ø 86 2140 PRINT "HERITAGE FOUNDAT ION, IT IS OWNED BY THE ARI ZONA": "HISTORICAL SOCIETY." !Ø52 215Ø RETURN !136 2160 PRINT "TUCSON CONVENTIO N CENTER": : "260 S. CHURCH A VE." !222 2170 PRINT : : "THIS COMPLEX INCLUDES A": "SPORTS ARENA, C ONVENTION FACILITIES, A C ONCERT HALL," !Ø37 2180 PRINT "A LITTLE THEATRE , LANDSCAPEDGARDENS, PUBLIC PAVILIONS, AND PARKING AREA S." !Ø45 219Ø PRINT : :"1989 ADDITION S INCLUDE AN EXHIBIT HALL, A GRAND": "BALLROOM, AND A G ALLERIA." !Ø46 2200 RETURN ! 136 2210 PRINT "CUSHING STREET B

AR AND": "RESTAURANT": : "343 S. MEYER AVE." !Ø65 2220 PRINT : : "THIS COMBINES THE JOSEPH": "FERRIN HOME AN D A COUNTRY STORE BUILT MO RE THAN 100" !187 2230 PRINT "YEARS AGO AND IS NAMED FOR ARMY OFFICER HOW ARD CUSHING.": : : "MONTIJO H OUSE WAS BUILT" !152 2240 PRINT "DURING THE CIVIL WAR AND": "REMODELED IN THE 1890S INTO ONE OF TUCSON'S E LEGANT": "VICTORIAN HOUSES." !Ø3Ø 225Ø RETURN !136 2260 PRINT "TUCSON PUBLIC LI BRARY": "MAIN BRANCH": : : "20 Ø S. SIXTH AVE." !23Ø 227Ø RETURN !136 2280 PRINT "U.S. POST OFFICE "!169 229Ø PRINT : :"141 S. SIXTH AVE." !239 2300 RETURN !136 2310 PRINT "TRAILWAYS BUS DE POT": :"201 E. BROADWAY BLVD 2320 PRINT : : "GREYHOUND B US DEPOT": : "2 S. FOURTH AVE "!Ø38 233Ø RETURN !136 2340 PRINT "CONGRESS HOTEL": :"311 E. CONGRESS ST.": : : "A 1934 FIRE THAT PARTIALLY DESTROYED THIS ELEGANT." !1 61 2350 PRINT "THREE-STORY HOTE L ALSO": "ULTIMATELY LED TO T HE ARRESTOF JOHN DILLINGER A GANG." !Ø87 ND HIS 236Ø RETURN !136 2370 PRINT "SOUTHERN PACIFIC RAILROAD STATION--AMTRAK" : : "400 E. TOOLE AVE." !01 Ø 238Ø RETURN !136 239Ø PRINT "VALLEY NATIONAL BANK": : "2 E. CONGRESS ST.": TUCSON'S FIRST SKYSCRAP ER." !201 2400 PRINT : "GIANT MURALS IN SIDE THE": "BUILDING DEPICT L IFE IN": "EARLY TUCSON" !Ø37 241Ø RETURN !136 2420 END !139

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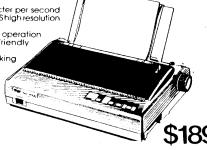
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EXTENDED BASIC

Transferring files between the 4A and PCs without a modem

By JERRY STERN ©1990 J.L. Stern

Sometimes I need a text file in the wrong place. That is, my computer table has both a TI 99/4A and a PC-compatible computer on it, and they get equal space because I use them both. But sometimes the files I want are on the other system. I need to be able to transfer files anytime I want. There are several ways to do this, but not all of them are practical.

There are several programs available that will emulate an IBM drive on a TI 99/4A, but they require a double-sided, double-density drive. And of course, that disk drive needs a disk drive controller that can recognize double-density. The original TI controller card can't do that, although most of the other manufacturers' cards can. Ah, but my controller card dates back to when TI discouraged other manufacturers from doing business.

There has to be a cheaper option than upgrading drives and controller cards. Using two modems and a telephone line between them will work, but my computers are right next to each other, and they share just one external modem. And it has a maximum rate of 1200 baud. That's adequate, but not ideal, and modem file transfers of text files tend toward carriage return mayhem. The carriage return ghouls float through the phone lines, sprinkling some returns here and there, and stealing complete sets of them somewhere else. I think they breed extra carriage returns, because I always seem to get back more of them than I lost.

The easiest solution to this problem is to forget the ghouls, and a lot of other problems. I've simply wired the two computers together with a straight cable from one RS-232 port on one computer directly to the RS-232 port on the other computer. That shouldn't work. Two computers wired together that way would both try to send data on the same wire, and should similarily both try to receive data on another single wire. Two IBM PC's, or two clones, or two

TI 99/4As cannot be wired together that way

When Texas Instruments designed the RS-232 card, they either were trying to be obstinate, or they were planning to sell the 99/4A as a terminal for a central computer. Wires No. 2 and No. 3 on the RS-232 connections are reversed from the conventional pattern. As it happens, those are the same wires that are crossed in a "null modem." That is a little gadget that allows two PC's, or a TI and a Geneve, to be wired together. It flips the data sending and data receiving wires around so that the two computers can get their signals straight.

When TI designed the RS-232 card, they either were trying to be obstinate, or they were planning to sell the 99/4A as a terminal for a central computer. Wires No. 2 and No. 3 on the RS-232 connections are reversed from the conventional pattern. As it happens, those are the same wires that are crossed in a 'null modem.'

When TI flipped those two wires, they caused us a lot of aggravation. In order to hook up a modem or most serial printers, we need a special cable that flips those two wires. The TI Impact Printer is the exception to that rule. It was ordered by TI from Epson to match that funny wire setup, so only the TI 99/4A can use it without converting it to a parallel printer.

Those flipped wires allow us to do only one thing more easily than we could do otherwise; we can hook a TI and a PC together without a null modem or any fancy cables, using just a plain DB-25 plug at the TI end, and whatever plug the PC needs at the other. Using a direct connection

means that we don't need a modem at either end, and therefore we aren't limited to the speed of our modems. The TI RS-232 board can handle up to 9600 baud. That's 9,600 bits of information per second. It takes eight bits to make a byte of data, and it takes one byte to send one character across a communication line. So 9600 baud would be 1,200 characters per second, but some time is taken up with error checking and spacing between characters. Effectively the speed is not that high, but it is still very good for ourpurposes.

So much for hardware. Let's try software. At the PC end, we'll need a terminal program like Procomm, or Boyan, or whatever you prefer. Any terminal software should be fine, because we won't need anyspecial features beyond sending typed messages, logging incoming text to a diskfile, and sending (UPloading) an ASCII file to the remote system.

A word processor will be needed, of course. Any word processing program will do, but you will need search and replacecapabilities that can handle not just characters like a, b, c, but also special codes like TAB, and RETURN. Word-Perfect is greatfor this project. It can handle the special character searches, and it can place them in a macro, too. Macros can be a big helpby performing all the steps of a complex series of procedures automatically.

At the TI or Geneve end, you'll need TI-Writer, orequivalent, and Telco, or similar. The requirements for thissoftware are even less stringent then at the PC end. The wordprocessor won't need any fancy search, replace or macrocapabilities because the Extended BASIC programs TEXT-PC and PC-TEXT will take care of the special replacements. The terminalprogram only needs to be able to save an incoming text file as a log file on disk.

Of course, Telco could send an unprocessed text file to the PC without benefit

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EXTENDED BASIC—

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of TEXT-PC. It could, but without a lot of tinkering with the line settings, it would probably arrive as an unformatted mass of text with either a carriage return at the end of every line, or no carriage returns at all. Either way, that would make reformatting the text very difficult.

We'll look at sending files to the PC separately from receiving text files back. The techniques are similar, but some of the steps will vary slightly.

Begin with a text file. Choose something that is just text, with no formatter commands or embedded printer control codes. Save it in the usual fashion; from TI-Writer you may use either Save File (SF) or Print File (PF). Print file can either print the file to a printer, or it can save a file to disk without the tab line at the end. It doesn't matter which option you use. TEXT-PC will remove the tab line if it finds one. No special format is needed, but a file with no blank spaces on the left margin will be easier to format when it arrives at the PC. Got it? That's no blanks at the left end, no formatter commands, and no embedded commands for the printer.

Load TEXT-PC. Think of it as TEXT going TO the PC. Next month's program will bring it back. On the PC, load the terminal program, and set the communications options. Use 9600 baud, eight data bits, one stop bit, and no parity. Turn the echo off. Most bulletin boards use these same settings; 1200 baud with 8N1 is used on most boards. You might not have to change any setting other then the baud rate.

Next, turn on the log file at the PC. You will need to provide a new name (and probably a path) for the new file.

Now, with the log waiting at the PC, run TEXT-PC. The settings for communication are already set in the default port setting: "RS232.BA=9600.DA=8.PA=N.CRLF" In English, that's 9600 BAud, eight DAta bits, No PArity, and add no Carriage Returns or Line Feeds. Press ENTER to use the default port setting. Youcould use a disk file, but we'll try that a little later. TEXT-PC will ask for a file name next. Enter the drive number and file name and press ENTER.

The file should start appearing on the PC screen. When TEXT-PC asks about prin-

Quick Reference: from TI to PC

- 1. Prepare a text file: No formatter commands or printer codes.
- At PC: Load terminal program. Set paramters: 9600 baud, 8 data bits,
 1 stop bit, no parity. Open a log file.
- 3. At TI: Run TEXT-PC. Send text file over cable to PC. Shut down TI.
- 4. At PC: Close log file.
- 5. Load log file into word processor.
- 6. Search: remove all carriage returns.
- 7. Search and replace: replace!! with carriage return and TAB.
- 8. Save the file.

ting another listing, close the log file on the PC. If you do want to send another file, reopen a new log file under a new name.

No, we're not done. The file that TEXT-PC sent over the cable is a little unusual. In order to make this process easier for anybody, I've eliminated the worrisome decisions about how to scare off the carriage return ghouls. Normally, both the sending program and the receiving program can add a return, remove the returns, or leave them alone. The same options apply, again on both ends, for line feeds. That's three decisions times four choices This must be where the ghouls multiply the carriage returns. Better to not give them the chance.

Since carriage returns usually limit paragraphs for reformatting in a word processor, they are needed in the file. Rather than mess with resetting all four of those options three different ways, TEXT-PC has simply removed all of the carriage returns, and replaced them with the symbol "!" instead. In order to prevent the file from being fractured at random by the receiving terminal program, a single blank space has been added at the end of each line.

This is where those search and replace capabilities come in. Load the logged text file into your PC word processing program. It will look all smashed together, as if it were all one big paragraph. On some programs, it will appear as just one line. If that happens, just scroll down, and the text should reformat so that it all becomes visible. Go to the top of the file. Using the search and replace function, search globally for every occurrence of "[1]" and replace each of them with a carriage return and a TAB. (Globally means all of them, or "no confirmation.") If you prefer block format

instead of indented paragraphs, replace with two carriage returns and NO tabs, instead. The text should now reform into a properly formatted set of paragraphs.

If your word processor on the PC has macros, create a macro that includes all of the conversion steps above. Be sure to begin with the instruction to go to the very beginning of the document to start the searches.

That's about it for sending text from the TI to the PC. The program itself is very simple. TEXT-PC simply opens a source file, reads a line, replaces any carriage returns it finds with, adds one blank character, and sends it over the cable to the other computer. One variation is possible. If your two computers are separated by precisely the distance that separates your home and office, and therefore the cable between them is a phone line, it may be easier to go ahead and use Telco to do the sending. If your are sending the data in care of a bulletin board, or BBS, then definitely use Telco for the entire process. In that case, substitute a file name when TEXT-PC requests confirmation of the RS232.BA=9600... port description. That will send the doctored file to a disk file, and that new file can be sent to the remote computer, or via the BBS, as an ASCII upload.

While you are looking up macros on your PC word processor, write another one. Make one that will start with a normal text file, add !! before each carriage return, without removing any, and add !! at the very end of the file. You'll use that next month to prepare a text file to go back the other way, from the PC to TI-Writer.

(See Page 18)

TRIALS OF A c99 BEGINNER

The SEG\$ Function

By CHARLES E. KIRKWOOD JR.

A new function will be introduced. In Extended BASIC there is a function called SEG\$ which returns a substring(segment) of a string. The string returned starts at a **position** in **string-expression** and extends for **length** characters.

The new function will be somewhat like this SEG\$ function. I'll call it seg(y,x,s,t) where x= the string, y= the segment, s= the column number (starting with zero), and t= the segment length. This can be added to your STRING function library along with strcpy(s1,s2) (copy s2 into s1) and strcpy(s1,s2,n) (copy at most s1).

The function seg() is written twice, first using arrays and then using pointers.

```
/*COPY A SEGMENT OF A STRING -- USING ARRAYS*/
seg(7,x,m,n)
char x[],y[];
int m,n;
{
    int i,j,k;
    k=m+n-1;
    j=0;
    for(i=m;i<=k;++i)
    {
        y[j]=x[i];
        ++j;
    }
    y[i]=0;
    return;
```

/*COPY A SEGMENT OF A STRING -- USING POINTERS*/

Suppose we now take an example using the seg() function. The search program (April 1988) is revised to make use of a record (line) of 80 columns divided into four fields of 20 each. This program can be used as a type of inventory search. The first field will contain a general name while the remaining fields in the record contain specific information. Several good examples come to mind. One could be a coin collection inventory search, another a stamp collection inventory search and still another a home inventory search.

An example of data for a coin collection might be (column numbers are for information only and may be omitted):

```
(column numbers for information only -- may be omitted)
#123456789#123456789#123456789#123456789#123456789#123456789
PENNY INDIAN
                     1986 G S
                                   1.44 1918S G S
 1897 G S
                1.25
MICKLE BUFFALO
                     1918 AG S
                                     .25 1919 AG S
                                                         . 25
 1923 AG S
                 .25
NICKLE BUFFALO
                     19278 G S
                                   2.44 1929 AG S
                                                         .31
 1929 AG S
                 .25
```

In this example program, only the first keyword can apply to (See Page 19)

EXTENDED BASIC—

(Continued from Page 17) 100 ! TEXT_PC JLS 2/90 V 1. Ø FORMATS TEXT FILES FOR RS2 32 PORT 1014 110 CALL CLEAR :: CALL BLUE :: CALL TITLE !Ø82 120 DISPLAY AT(10,1): "NAME O F INTERFACE OR FILE?": "RS232 .DA=8.BA=9600.PA=N.CRLF" :: ACCEPT AT(11,1)SIZE(-28):D\$ 1083 130 DISPLAY AT(13,1):"FILE T O LIST?": "(MUST BE IN DISPLA Y/VARIABLE 80 FORMAT)":"DSK1 ." :: ACCEPT AT(16,4)SIZE(-2 5):P\$:: P\$="DSK"&P\$!190

140 IF P\$="" THEN STOP ELSE IF LEN(P\$)<3 THEN 13Ø 1054 150 OPEN #1:P\$, DISPLAY , VARI ABLE 80, INPUT :049 160 OPEN #9:D\$, VARIABLE 80,D ISPLAY ,OUTPUT !146 170 IF EOF(1)THEN 220 ELSE L INPUT #1:A\$!Ø7Ø 180 IF ASC(SEG\$(A\$, LEN(A\$), 1))<32 THEN A\$=SEG\$(A\$,1,LEN(A\$)-1)&"||" !Ø37 190 IF ASC(A\$)=128 THEN IF L EN(A\$)=22 THEN 220 !114 200 PRINT #9:A\$&" " !Ø85 21Ø GOTO 17Ø !249 220 CLOSE #1 :: CLOSE #9 !18

295Ø5 SUB BLUE !149
295Ø6 SUB BLUE !149
2951Ø ! SWITCHES DISPLAY TO
WHITE ON BLUE; JLS 7/88 !23Ø
29515 CALL SCREEN(5):: FOR L
=Ø TO 14 :: CALL COLOR(L,16,
1):: NEXT L :: SUBEND !2Ø2
3259Ø SUB TITLE !24Ø
326ØØ DISPLAY AT(2,1Ø):"TEXT
-PC" :: CALL CHAR(96,"ØØFF")
:: CALL HCHAR(3,12,96,7)!179
326Ø5 DISPLAY AT(5,1):"
LISTS TEXT FILES
TO DIRECT PC PORT " !248
32635 SUBEND !168

TRIALS OF A c99 BEGINNER—

(Continued from Page 18)

the first field. In other words, the first keyword might be PEN-NY or PEN or INDIAN or IND or NICKLE or NIC or BUF-FALO or BUF, etc. The whole word does not have to be used, just enough to keep from getting mixed up with other keywords, if used. Any consecutive group of characters can be used as a keyword (including a blank). Each of the next three fields in the record contains the date, the condition, the location, and the value. You, of course, can choose your own abbreviation scheme. For this example, the last eight columns of each field are used for the coin value. This value must be converted to a floating-point number so that a total can be obtained.

A total of five keywords may be used. If two keywords, PEN-NY and 1906, are used, the 1st two fields of this record are printed. If NICKLE and 1919 are used, the 1st and 3rd field are printed. The coin type (first keyword) may be omitted. If only a date is chosen as the keyword, the first field with all fields containing that date will be printed. If only one keyword, BUFFALO, is chosen, all BUFFALO nickles will be printed. If only one keyword, BU, is chosen, all BUFFALO NICKLES and all BU condition will be printed. If you want to print out only BU type coins, choose BU followed by a blank for the keyword. Or you could use a blank as the first keyword and BU as the second one. A total is printed at the end of the printout.

In order to use the floating-point function stof(s,f) to convert

the string s to the float array f, there can not be any leading blanks before the number in the string. A function value(d,a) is written to eliminate the leading blanks. Actually, all that is done is to move the pointer to the right before converting.

The **fndstr()** function with the program uses pointers rather than arrays as in the April issue.

```
/*INVENTORY SEARCH PROGRAM*/
#include DSK1.STD10
#include DSK1.FLOATI
main()
  char buff[81],fnc[25],ic[5],c[21],d[21];
  int a,b,col,in,i,out,pr,k,fn,r,k1,k2,t;
  int n,nr,blen,j,x,m,keyln,yn,pt,cl,p,u;
  char key[6][2#]; /*keywords*/
  int keylen[6]; /*length of keywords*/
  char kk[2];
                   /*one keyword for argument*/
  char s[1#];
  float amt[8],tot[8];
  puts("
               INVENTORY SEARCH PROGRAM\n");
               Charles E. Kirkwood, Jr.\n");
  puts("
  puts("
              Box 1241, Clemson, SC 29633\n\n");
  puts("Input disk and file name ");
  fn=gets(fnc);
```

(See Page 20)

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HardMaster is the most capable sector editor available for the HFDC! Fix corrupted files, back-up essential information, get a "tree" like listing of your directories and files, and much more! Also excellent for use with floppies. Easy to use and with extensive documentation on hard-drives, the essential tool for any HFDC user. Requires HFDC system, disk, 32K or Geneve. By Colin Christensen.

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TRIALS OF A c99 BEGINNER—

```
(Continued from Page 19)
                                                                                   else
col=81:
puts("Input number of key words ");
                                                                                    u=u+1;
n=atoi(gets(ic));
                                                                                     puts(c);
while(n>#)
                                                                                    puts(d);
                                                                                    value(d,amt);
 in=fopen(fn,"r");
                                                                                    if(u==2#)
 puts("input number of matches required ");
 nr=atoi(gets(ic));
                                                                                      puts("press (ENTER) ");
 puts("Do you want a print out? (Y/N) ");
                                                                                      t=getchar();
 yn=getchar();
                                                                                      putchar(1∅);
 if(yn=='Y')
                                                                                      u=∮;
   pt=fopen("PIO","w");
 b='a';
 puts("\ninput key word(s), terminate each with (ENTER)");
                                                                                  r=p;
 putchar(1);
                                                                                  fexp(tot,"+",amt,tot);
 for(i=1;i(=n;++i) /*input keywords*/
  gets(buff);
                                                                              k1=k1+20:
   strcpy(&key[i][#],buff);
  keylen[i]=strlen(&key[i][#]);
                                                                          puts("TOTAL VALUE = $");
putchar(1#);
                                                                          fpput(tot,s);
u=∮;
                                                                          fclose(in);
 itof(∅,tot);
                                                                          if(yn=='Y')
k2=21:
c1=2#:
                                                                           fputs("TOTAL VALUE = ",pt);
while(b)
                                                                           fputs(ftos(tot,s,#,#,2),pt);
                                                                           fclose(pt);
  p=#;
  b=fgets(buff,col,in); /*input record*/
                                                                         puts("\nType # to stop.");
  k1=#;
                                                                         puts("\ninput number of key words ");
  seg(c,b,k1,k2);
                                                                         n=atoi(gets(ic));
  keyin=keylen[i];
                                                                       }
  strcpy(kk,&key[1][#]);
  p=fndstr(c,cl,keyln,kk);
  k1=k1+2#;
                                                                     /*SEARCH FUNCTION*/
  while(buff[k1])
                                                                     fndstr(b,blen,keyln,kk)
                                                                     int blen, keyln;
   r=p:
                                                                     char *b.*kk;
   seg(d,b,k1,k2);
   for(m=1;m(=n;++m)
                                                                       int i,j,p,s,k;
                                                                       p=blen-keyln;
     keyln=keylen[m];
                                                                       j=∮;
     strcpy(kk,&key[m][#]);
                                                                       while(j<=p)
     k=fndstr(d,ci,keyin,kk);
     r=k+r;
                                                                         if(*kk==*(b+j));
     if(r)=nr)
     {
       if(yn=='Y')
                                                                           while((s(keyln)&(*(kk+s)==*(b+j+s)))
                                                                             Hts:
         fputs(c,pt);
                                                                           if(s==keyln)
         fputs(d,pt);
         putc(10,pt);
                                                                            k=1:
        value(d, amt);
                                                                             return(k);
                                                                                        (See Page 21)
```

TRIALS OF A c99 BEGINNER-

```
(Continued from Page 20)
    }
  ++j;
return(k);
 /*COPY A SEGMENT OF A STRING*/
 seg(y,x,m,n)
char *x,*y;
 int m,n;
   int i,k;
   k=m+n-1;
   for(i=m;i<=k;++i)
     *y++=*(x+i);
   *y=∮;
   return;
 /*VALUE FUNCTION*/
 value(d,a)
 char *d;
 float a[];
    int m,n;
   char *e:
   m=12;
   n=8:
   e="
   seg(e,d,m,n);
```

Some amount of compilation and assembly time can be sayed by including the needed functions, atoi(), strlen(), strcmp(), strcpy() along with your program rather than include the entire STRING and CONV libraries. Don't forget to link CSUP, CFIO, and FLOAT with your program after assembly.

MICROpendium INDEX

Do you have your MICROpendium index? If you haven't, you can obtain an index disk by sending \$5.00 to MICROpendium. It is well worth the money.

There have been a number of index programs in the magazine over the last couple years. Most of them have been in Extended BASIC with the index in DATA statements. A considerable time and effort went into going through the magazines for this information. Each program on the index disk sorts the annual index in an alphabetic order and prints it out. Also included on this disk is a program by Jacques Groslouis for retrieving specific articles using keywords.

The April 1988 c99 program SEARCH can be used for any D/V 80 file, which can also include an index. But there is one important thing missing — data for the program, an index. Now, this program can have data very easily by getting this index disk, modifying the programs slightly to store the index files on disk in a D/V 80 format. Each article should be stored as a separate record. In this way you can add additional information as you see fit to help you when you want to make a search later on. In the same April 1988 issue is an I/O program in which you can merge yearly indices as you desire.

Expanding your system

Adding a disk drive, what to expect and what to look for

By JOHN KOLOEN

I think it is safe to say that anyone who is serious about using his computer should seriously consider acquiring a disk drive. A disk drive and controller are more important than memory expansions, RAM-disks, printers or color monitors. The only piece of equipment that might be more important than a disk controller/disk drive system is a Peripheral Expansion Box, though you can have a disk drive system without a PEB by using a CorComp Micro Expansion System or stand-alone sidecar disk controller.

For the purposes of this article, we'll

look at three system variations: a PEB with controller and disk drive; and briefly a MES with a disk drive; and a sidecar controller with a disk drive. The last of these is not recommended, but it is better than relying on a cassette recorder for data storage.

ENTRY LEVEL CASSETTE SYSTEM

Cassette storage of data is an entry-level system that allows buyers of the TI console to save and load relatively short BASIC and Extended BASIC programs. It was not designed to utilize memory expansions, assembly language programs or other powerful tools. This isn't a bad arrangement as

long as you are satisfied with using cartridge-based software. But the best software isn't available on cartridge. While there may be several hundred cartridge-based programs, there are thousands of programs that aren't on cartridges. In fact, there are devices, which we'll get into in a subsequent installment, that allow you to dump the contents of most cartridges to disk and load and run them without the cartridge.

Anyone who has upgraded from a cassette to a disk system probably remembers the first time he used the disk drive. I know I do. The first time I accessed the drive I

(See Page 26)

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more. 2 disk sides, speech & 32 K
req. Exbasic autoload.
#2. WHEEL OF FORTUNE, BLACKJACK &

JOKER POKER

Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it! any price. #3. DUMPIT

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

#4. PRINTART

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

50 ORIGINAL TI SALES DEMO DISK

WITH TI-TREK GAME

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

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

SPACE SHUTTLE MUSIC/GRAPHICS

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

#8. LOTTO PICKER

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

#9. MONA LISA PRINT OUT

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

#10. GOTHIC PRINT #10. GOTHIC PRINT
This disk lets you type out a
phrase on the screen and then print
it out in gothic (Old English)
style. Looks like hand-lettered
calligraphy. Use for invitations,
announcements and business cards.
#11 ANNATED CURETYME CARD.

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"

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

#12. TI-99 OLOPY

on any computer! #12. TI-99 OLOPY
This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

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

FIGURE STUDY (PG RATED) A collection of Playboy type centerfolds that can be printed out at your command. Use with any

at your command. Use with any printer.

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

#16. SIDEMANY PRINTOUT

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

upgrade. 7. TI FORTH DEMO \$17. TI FORTH DEMO
This demo disk was released by TI
to show the power of Forth. Fantastic music and graphics. Ed/ Assem and 32K required: #18. TI DIAGNOSTIC

#18. TI DIAGNOSTIC
This program loads into the MiniMemory module and checks out your
entire system. Much better than
disk based diagnostics that cannot
be used if a problem in the disk
system is at fault. Complete
documentation on second side.
#19. TI WRITER/MULTIPLAN UPGRADE
This disk released by TI adds real
lower case to your TI Writer, speed
to Multiplan and other
enhancements. Easy to use., just
substitute new files for old!
Instructions included.
#20. ACCOUNTS RECEIVABLE

#20. ACCOUNTS RECEIVABLE This self contained prize winning program loads and runs in Exbasic and has all the features found in a progessional accounting system. Complete with documentation and a second disk side with report

generating programs. #21. DATA BASE DEMO DISK #21. DATA BASE DEMO DISK

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

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

#23. WILL MOITTE:

#23. WILL WRITER

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

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

MEDICAL ALERT

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

bound to happen. A talented (but demented) programmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 13 to order this one!! #27. KIDS LEARNING

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

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

#29. LABEL MAKER I Two great programs for making custom labels for disks, addresses video tapes or any other application. Even contains a graphic display of the Ti-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels. #30. HOUSEHOLD BUDGET PRINTOUT with this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and that tain we used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming

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

EXBASIC XMAS MUSIC #32. EXBASIC ATAS MUSIC
Two disk sides full of high quality
xmas music that can be played
throughout the holiday season and
then used as a learning tool since
it contains wonderful arrangements
and expedies. Autoloading and menuand graphics. Autoloading and menu driven CHECKERS & BACKGAMMON

#33.

#33. CHECKERS & BACKGAMTION
A collection of great checkers and
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These are professional in quality
and will keep you busy for hours.
#34. SOLITAIRE & SCRABBLE #34. Sollitable & Scrabble
Another collection of classic games
for the TI-99/4A. Exbasic & 32k req
#35. PROGRAMMING AIDS & UTILITIES I #35. PROGRAMMING AIDS & UTILITIES A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

#36. STRICTLY BUISINGS.

#36. STRICTLY BUSINESS
A collection of various programs A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk security performance. Two disk sides filled with financial and business related programs #37. LAPD COOKBOOK

This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great receipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen. #38. GREAT 99/4A GAMES VOL. I A collection of professional games in assembly and exbasic that all load from a menu in exhasic.

load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially. #40. ARTIFICIAL INTELLIGENCE This disk contains the famouse computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm. programs so you can analyze all your emotional problems at one sitting. #41. VIDEO GRAPHS MODULE BACKUP

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

Exbasic autoload.

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

side.

#43. BEST OF BRITAIN, VOL I
Now for the first time, a
collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of

Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

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

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

#46. SUPER TRIVIA 99
A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

#47. INFOCOM RAPID LOADER
If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all

screen colors and improved text display. Comes with all documentation on disk

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

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

closing walls. Hours or great arcade action. #50. OH MUMMY (from Germany) Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment. #51. BERLIN WALL (from Canada)

This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real

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

#53. HACKER/CRACKER
A collection of disk convine

#33. HACKER/CKAUKER
A collection of disk copying
programs that copy TI disks by
tracks. If one of these can't copy
a protected disk nothing will. We
included a collection of the very
best ones including both TI and
Corform compatible. These programs CorComp compatible. These programs require 2 disk drives and 32K of memory. #54. ASTRONOMY

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

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

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

documentation

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

#58. PR BASE The alltime most popular and widely used data base program for the TI-99'AA. A freeware program that is widely supported and updated. #59. GRAPH MAKER

A collection of the best programs for producing graphs and charts from your data. Exbasic and printer. #60. FREDDY

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

#61. THE MINE
A fast action game from F.R.G. that
will keep you going for hours. Many
screens and skills required.
#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on
Disk. For legal reasons it is only

available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG A pair of great games that continue where Parsec and Munchman leave Imagine Parsec with enemy

off. Imagine raiset with elemy space craft coming from in front and in back of your ship!!!
#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99 4A for hours. Great!
#65. Department with the space of the

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

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

#67. GENEALOGY Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records. #68. CHESS

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exhapic auralload. included. Exbasic autoload. #69. COMPUTER PLAYER PIANO/KEY-

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of two types of sorts.
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Two bible games)non-fiction) that work with the TI Adventure Module.

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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.

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

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

led to the Zork series. Hours of text adventuring.

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

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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)

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features music/graphics written
in 100% assembly and what comes
from the TI sound chip is sure to
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#118. FAST TERM

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#119. RAG LINKER

A utility for converting DIS/FIX 80 assembly object code files to PROCRAM image. This allows files to load faster and take up less space on disk. Full Doc #1200 RIMMEN

Full Doc

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

#121. SUPER YAHTZEE & WHEEL II
If you like Yahtzee this disk is for
you. A great version written in high
speed assembly. Also included is another
version of Wheel of Fortune which also
lets you create your own puzzles with a
puzzle edit program included.
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Attily adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST GOLD" which is one of the better ones we have seen recently.





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TEXAS INSTRUMENTS

EXPANDING YOUR SYSTEM—

(Continued from Page 21)

knew I was into something completely different and wonderful. It was akin to the feeling I had the first night I took the TI console out of the box and plugged it into a black and white TV on the kitchen table. It was like Christmas to a nine-year-old. Only I wasn't nine.

With the addition of a disk system, you are catapulted into a new realm of computing. Suddenly you are able to save and load programs in seconds, operations which took minutes with a cassette recorder. You can load and save these programs by name, too, instead of keeping track of their locations on a tape counter. No longer are you limited to viewing computer operations in a sequential manner.

Yes, owning a disk drive system can change your computing life. Now to the details.

DISK CONTROLLERS

Selecting a disk controller is relatively straightforward. If you have a PEB, you'll need a disk controller *card*. The card fits into the PEB. Disk controller cards have been manufactured by a number of companies, including Texas Instruments, Myarc Inc. and CorComp Inc.

Disk controllers are used to communicate between the computer CPU and the disk drive. The controller makes it possible to format disks — prepare them to hold data — and to copy, delete, protect or unprotect files and programs. These functions are done through disk manager software which is provided with the disk controller.

Each of the three above mentioned controller cards has unique characteristics. Examine the chart below:

DISK CONTROLLER CAPABILITIES

Disk format	CorComp	Myarc	TI
Single-sided	X	X	X
Double-sided	X	X	X
Single-density	X	X	X
Double-density	X	X	
Quad-density		X*	
*Requires special E	PROM		

Density as used here refers to the compactness of the information stored on a disk. A double-density disk holds twice as much data as a single-density disk. Similarly, a double-sided disk holds twice has much data as a single-sided disk. See the chart below:

CAPACITY OF DIFFERENT FORMATS

Format	Capacity
SSSD	90 kilobytes
DSSD	180 kilobytes
SSDD	180 kilobytes
DSDD	360 kilobytes

You should notice that a double-sided, double-density drive lets you store four times the data as a single-sided, single-density drive. All other things being equal, you'd be better off with a DSDD drive than a SSSD drive.

CONTROLLER DETERMINES FORMAT

However, even if you have a DSDD drive, you may not be able to format DSDD disks. This depends on the capabilities of the disk controller. The TI disk controller, for example, doesn't support doubledensity formats. Incidentally, although manufacturers label their diskettes as being suitable for double-sided, doubledensity use, they are equally suitable for use as single-sided, single-density formatting.

Both the CorComp and Myarc floppy disk controllers (including the Myarc Hard and Floppy Disk Controller) support single-sided single-density through doublesided double-density. Here is a chart showing the formatting characteristics of the three controllers:

Number of sectors per format

Format	CorComp	Myarc	TI
SSSD	360	360	360
SSDD	720	640	NA
DSSD	720	640	720
DSDD	1440	1280	NA

A sector as used here refers to the subsections of a track that holds the stored data. It is the smallest addressable space on disk media. A track consists of a collection of sectors. In the case of a SSSD diskette, there are nine sectors per track and 40 tracks. Multiply 9 by 40 and you get 360, the number of sectors. A double-density disk would have 18 sectors multiplied by 40 tracks for 720 sectors. A DSDD disk would have 18 sectors multiplied by 40 tracks for each of its two sides to equal 1440 sectors.

The Myarc controller uses 9 sectors for SSSD and 8 sectors for another format. It uses 8-sector tracks because Myarc regards 8 sectors to be a better format than 9.

The upshot of this is that beyond SSSD, disks formatted on these controllers are not compatible with each other. In other words, a disk formatted using 8 sectors per track can't be read by a controller that looks for 9 sectors per track. This is one reason why the bulk of TI software is distributed on SSSD disks, to maintain compatibility with all controllers.

Which is better: 8 or 9 sectors per track? I don't think it matters to the majority of users. Some people like CorComp products, others like Myarc, and the rest don't care one way or another. Both are more flexible than the TI controller. Incidentally, both the CorComp and Myarc floppy controllers will handle up to four floppy disk drives, and the TI will handle up to three.

Once you've decided on a controller, the next step is to obtain a disk drive. This is the easy part. Virtually any 5.25-inch floppy drive that will work on a PC will work on a TI. This means that disk drives meant for Commodore 64 or Atari or Apple computers won't work. But those that are installed in PC clones will. They are available from a variety of sources, including advertisers in this magazine.

Assuming you've got a PEB, you will be installing a drive in the PEB itself. Since the PEB has its own power supply all you will need is the drive. But should you get a *full-height* drive or should you get a *half-height* drive?

A full-height drive is twice the width of a half-height drive. The PEB drive slot is designed to accept a full-height drive. However, it will also hold two half-height drives. And two drives are better than one. But, if you try to install two half-height drives in the PEB you have to modify the power connector. If you aren't handy around electrical devices, you may want to purchase a kit designed to make this project simple. Tex-Comp sells an installation kit for two half-height drives for \$29.95. Those who are more adventurous or knowledgeable can proceed on their own.

Let's say for now that you want to install a single drive in the PEB. I recommend that whatever you get that it be capable of handling DSDD disks. These drives are available virtually everywhere since these

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EXPANDING YOUR SYSTEM—

(Continued from Page 26)

are the drives that are used in PCs. Even if you use a TI controller card, which can't format DSDD, it can still use the drive for DSSD or SSSD. Generally, the DSDD drives are better built than the older DSSD drives.

MAKE SURE YOU'VE GOT CABLES

Once you've got a drive, you'll need to have cables. In most cases, your disk controller card should come with a short ribbon cable to connect a drive to the PEB, a second longer ribbon cable to connect the controller to external drives, and a small wafer board adapter used to connect external drives. (If you buy a used controller, make certain that it includes the two cables, the adapter board and a complete manual. If it doesn't include the cables you will definitely be inconvenienced in obtaining what you need, especially if you don't live in a relatively large city with large electronic supply businesses.)

The short cable is used to connect the internal PEB drive to the disk controller. One end plugs into the disk drive and the other plugs into the controller. A four-pin molex connector is used for connecting the disk drive to the PEB power supply. Once the cables are connected, you seat the drive in its slot and fasten it with machine screws.

External floppy drives — drives that aren't installed in the PEB — require a power supply and disk drive enclosure. You will also need to set some dual inline pins (DIP) according to the manufacturer's instructions. You'll also need the cable and adapter board that comes with the controller card.

The manuals that come with any of the above mentioned controllers are quite thorough about installation procedures, and I won't try to duplicate them here. (The December 1988 MICROpendium carried an article about installing disk drives.)

DISK DRIVE WITH A MINI-EXPANSION SYSTEM

Everything about disk drives above is the same for the CorComp MES. The only difference has to do with the controller card. The MES comes with the CorComp disk controller install-

ed. You plug a cable from the MES to the drive and off you go. However, the drive must have its own enclosure and power supply since the MES doesn't have a power supply. Like the card version of the Cor-Comp controller, the MES version also handles up to four floppies.

DISK DRIVE WITH A SIDECAR CONTROLLER

With a sidecar controller, you are pretty much on your own. TI manufactured these devices prior to developing the PEB. The controller plugs into the right side of the console and the disk drive is plugged into the sidecar controller. Like the MES, the drive you use must have its own enclosure and power supply. The TI controller supported only SSSD drives.

Several manufacturers produced these types of devices but none has been produced for several years. If you find one, it will probably be used. It is unlikely that you will ever find anyone to support these third-party controllers. I do not recommend them since they could easily prove to be more trouble than they are worth, especially for novices. Those who currently use these devices more than likely purchased them when they were still being produced and

Myarc HFDC in a class by itself

You may have noticed that the main article didn't have much to say about Myarc's Hard & Floppy Disk Controller card. That's because this device is in a class by itself, both in terms of price and capabilities.

The device costs about \$250-\$300 and allows you to control up to four floppies and three hard drives on a 99/4A. With the addition of an 80-track EPROM, it can also use quad-density, 3.5-inch drives. Disks formatted on these drives hold up to 720 kilobytes of data, twice what a DSDD 5.25-inch disk will hold.

I recommend the HFDC to anyone who eventually wants to upgrade to a hard disk system. It is the only hard disk controller available for the TI, other than Myarc's old Winchester hard disk (reviewed in the March 1985 MICROpendium).

The HFDC was reviewed in the September 1988 issue of MICROpendium.

could obtain support from the manufacturer or vendor.

WHAT'S IT GOING TO COST?

You can figure on spending about \$150 for a new floppy disk controller (including cables and manual). Cost of a floppy drive without power supply for installation in the PEB will vary depending on whether you go full-height or half-height. For a new full-height drive, expect to pay \$60 or less, and for a new half-height drive expect to pay \$80 or less.

For external drives, the cost of a of a fullor half-height drive with enclosure and power supply should set you back about \$120.

If I were going to install two drives, I'd give serious consideration to obtaining two half-height drives and an installation kit for the PEB since this would avoid the additional cost of having to purchase an external enclosure and power supply.

Avoid the temptation of buying the cheapest drive you can find. In most cases, you won't actaully be able to examine the drive before purchasing it so either select a well-known brand name or buy from a vendor that you are familiar with or who has been in business for years. Establish-

ed business get established because they satisfy their customers.

Prices of used equipment vary considerably. Good places to look for used equipment are classified ads in MICROpendium, local newspapers and other computer publications. However, most other magazines charge so much for classified ads that only commercial dealers can afford them. Also, check out pawn shops, Goodwill stores, flea markets, computer fairs and other places that deal in second hand goods.

The main word of advice I have on purchasing used equipment is to make sure that it works before you pay for it. A used disk drive for \$30 may look like a great bargain. But if it needs to be realigned — a common problem with older drives — it could easily cost you another \$50 to get it to work. Suddenly your \$30 drive costs more than a new one.

Next month: RS232 cards, modems and printers.

Planting time How much seed and fertilizer to use

Believe it or not, spring is just around the corner. For many, that means its time to start planning the spring garden.

The program published here is designed to help gardeners take some of the guesswork out of the process. By inputting the length of the row of any of 23 vegetables, the program calculates the amount of seed or sets you'll need as well as the amount of fertilizer (manure or chemical) you'll need to use.

The program was converted from a version done in a PC version of BASIC. Virtually nothing was done to customize it for the TI. The original program was listed to

a disk as a text file and then edited using TI-Writer. Only a few changes had to be made in the PRINT commands and the DIMension statement had to be moved from the bottom to the top of the program. The TIW file was then converted into a BASIC program.

Improving the appearance of the program in the TI Extended BASIC environment shouldn't be a difficult task. Converting the PRINT statements to DISPLAY AT and the INPUT statements to ACCEPT AT will certainly improve its display characteristics. Add a little color and some sound and it

could become something worth using over and over.

Users may modify the vegetable list. Instructions are included in REM statements starting at line 1200. You can increase the number of vegetables as well, just remember to change the DIM subscript.

The program is about 6 kilobytes in length, so there is plenty of room for expansion. It can be easily modified to run in console BASIC by changing the program lines that use statement separators (double colons).

Happy gardening.

GARDEN PLANNER

10 REM GARDEN PLANNING PROGR
AM !Ø26
20 REM Original by Ted Batut
is 1982(c) for PC !229
3Ø REM Converted for T199/4A
by J. Koloen (5/89) !255
40 REM Runs in Extended BASI
C !Ø44
5Ø REM! 154
6Ø REM! 154
70 REM Initialization !130
80 REM The variables are CRO
P, OUNCES, SPACING, YIELD, U
NITS, FERTILIZER RATE 1004
90 REM for MANURE (1) and 10
-15-10 (2) !035
100 DIM C\$(23),O(23),S\$(23),
Y(23),U\$(23),F1(23),F2(23)!2
38
110 GOSUB 1520 !069
120 CALL CLEAR !209
13Ø PRINT "**********
******* ! 150
140 PRINT " GARDEN PLANNING
PROGRAM" !251
15Ø PRINT "************
******* ! 150
160 FOR I=1 TO 500 :: NEXT I
! 255
170 PRINT "DO YOU WANT DIREC
TIONS?" !215
18Ø INPUT A\$!247
190 IF A\$="Y" OR A\$="y" THEN
GOSUB 710 !174
200 REM start of program !24
· •

5	
210 CALL CLEAR !209	
220 PRINT "DATA FOR THE I	FOLI
OWING CROPS" 1025	
230 PRINT "IS AVAILABLE:	. 1:
31	•
240 PRINT " 1 Snap Beans	13
Onions" !16Ø	
250 PRINT " 2 Pole Beans	14
Peas" !177	
260 PRINT " 3 Lima Beans	15
Peppers" !255	
270 PRINT " 4 Beets Potatoes" !121 280 PRINT " 5 Broccoli	16
Potatoes" !121	
280 PRINT " 5 Broccoli	17
Pumpkins" 1093	
290 PRINT " 6 Cabbage Radishes" !195	18
Radishes" !195	
300 PRINT " 7 Carrots	19
Spinach" !160	
310 PRINT " 8 Corn	20
Sum. Squash" !227	
320 PRINT " 9 Cucumbers	21
Win. Squash" !085	
330 PRINT "10 Eggplant Tomatoes" !095	22
Tomatoes" ! Ø95	
340 PRINT "11 Lettuce	23
Watermelon" !249	
350 PRINT "12 Muskmelons	24
>>EXIT PGM." !190	
360 PRINT "WHICH NUMBER D	X Y
OU WANT";!181	
370 INPUT A :: A=INT(A)::	: IF
A=24 THEN PRINT " GOOD O	3ARE
FNING!" PRINT FND !	100

380 IF A<1 OR A>24 THEN PRIN	1
T "INVALID CHOICE" :: GOTO 2	2
6Ø !Ø5Ø	
390 CALL CLEAR :: PRINT :: P	,
RINT !Ø13	
400 PRINT " YOU HAVE SELECTE	:
D ":C\$(A)!Ø42	
410 PRINT " HOW MANY FEET OF	:
ROW MIGHT YOU PLANT"	•
;!236	
420 REM! 154	
43Ø INPUT F !216	
440 CALL CLEAR !209	
450 PRINT "HERE IS THE INFOR	ł
MATION FOR" !2Ø4	
460 PRINT F;" FEET OF ";C\$(A	Ĺ
)!Ø72	
47Ø F=F/1Ø !Ø57	
480 PRINT "APPROXIMATE YIELD)
IS" !Ø2Ø	
49Ø Y2=INT(Y(A)*F+.5):: PRIN	ı
T Y2;:: PRINT " ";U\$(A)!193	
500 PRINT "AT A SPACING OF "	,
;S\$(A);" INCHES " !185	
510 PRINT "BETWEEN PLANTS."	
! 156	
520 IF A=16 THEN PRINT "YOU	
WILL NEED "; INT((O(16)*F)/16	;
):: PRINT "LBS. OF POTATO SE ED PIECES." :: PRINT :: GOTO	
ED PIECES." :: PRINT :: GOTO)
640 1066	
53Ø 02=O(A)*F !Ø69	
540 IF 02<.015625 THEN 02\$="	
LESS THAN 1/64" :: GOTO 630	

(See Page 29)

GARDEN PLANNER—

(Continued from Page 28)

550 IF O2>=.015625 AND O2<.0 3125 THEN O2\$="BETWEEN 1/64

AND 1/32" :: GOTO 63Ø !169

! 145

560 IF 02>=.03125 AND 02<.06 25 THEN 02\$="BETWEEN 1/32 AN D 1/16" :: GOTO 63Ø !Ø6257Ø IF 02>=.0625 AND 02<.125 THE N 02\$="BETWEEN 1/16 AND 1/8" :: GOTO 63Ø !171 58Ø IF 02>=.125 AND 02<.25 T HEN 02\$="BETWEEN 1/8 AND 1/4 " :: GOTO 63Ø !Ø15 590 IF 02>=.25 AND 02<.5 THE N 02\$="BETWEEN 1/4 AND 1/2" :: GOTO 63Ø !164 600 IF 02>=.5 AND 02<1.01 TH EN 02\$="BETWEEN 1/2 AND 1" : : GOTO 63Ø !1Ø7 61Ø 02=INT(02+.5):: PRINT "Y OU WILL NEED ABOUT ";02;" OU NCES" !211 620 IF A=13 THEN PRINT "OF O NION SETS." :: PRINT :: GOTO 640 ELSE PRINT "OF SEED." : : PRINT :: GOTO 640 !105 63Ø PRINT "YOU WILL NEED ";O 2\$:: PRINT "OUNCES OF ";:: IF A=13 THEN PRINT " ONION S ETS." ELSE PRINT "SEED." !12 640 PRINT "**** FERTILIZER R ATES ****" !172 650 PRINT "MANURE (APPROX):" ;!116 66Ø F3=INT(F1(A)*F+.5):: PRI NT F3;:: PRINT "LBS." !210 670 PRINT "CHEM. (10-10-10): ";!155 68Ø F4=INT((F2(A)*F)*1Ø+.5): : F4=F4/10 :: PRINT F4;:: PR INT "CUPS." !174 69Ø PRINT "HIT ENTER--->";:: INPUT A\$:: GOTO 210 !136 700 END !139 710, REM instructions !239 720 CALL CLEAR !209 73Ø PRINT " * * * * * * * * * * * " !020 740 PRINT "This program is d esigned to help you in plann ing and" !176 750 PRINT "planting your gar will be shown a l den. You ist of" !158

760 PRINT "crops. Pick one o f them by number. You will then be" !149 770 PRINT "asked how many fe et of row that you might be planning" !Ø26 780 PRINT "to plant of that crop. The program will then tell you" !241 790 PRINT "how much yield yo u can ex- pect, how much se ed you" !114 800 PRINT "should buy, and t he approxi-mate amount of fe rtilzer to" !Ø19 810 PRINT "use." !226 820 PRINT "Fertilizer rates will" !175 830 REM! 154 840 REM! 154 850 REM! 154 860 REM! 154 87Ø PRINT "HIT ENTER--->";!1 Ø8 880 INPUT A\$!247 890 CALL CLEAR !209 900 PRINT "be given in terms of pounds of manure per row and cups" !Ø51 910 PRINT "of 10-10-10 (a co mmon gardenchemical fertiliz er mix-" !Ø29 920 PRINT "ture). One word of warning: "!248 930 PRINT "Different soils n

eed differ-ent amounts of fe rtilizer" !181 940 PRINT "to give the best yield. For instance, sandy s oils re-" !111 950 PRINT "quire more fertil izer than clayey soils, wit h silty" !Ø41 960 PRINT "soils in between. The rates given will be for the aver-" !Ø46 970 PRINT "age type of soil. You should judge on your own how much" !Ø88 980 PRINT "more" !026 99Ø REM! 154 1000 REM! 154 1010 REM! 154 1020 REM! 154 1030 REM! 154 1040 PRINT "HIT ENTER--->";! 108 1050 INPUT A\$!247. 1060 CALL CLEAR !209 1070 PRINT "or less you shou 1d use in your own garden. Also, the" !127 1080 PRINT "fertilzer value varies widely de of manure pending on" !173 1090 PRINT "source and how i t has been handled. Experie nce is the" !193 1100 PRINT "best teacher in (See Page 30)

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GARDEN PLANNER—

(Continued from Page 29) gards." !034 these re-1110 PRINT ! 156 1120 REM! 154 113Ø REM! 154 114Ø REM! 154 1150 REM! 154 116Ø REM! 154 117Ø PRINT "HIT ENTER--->";! 108 1180 INPUT A\$!247 119Ø RETURN !136 1200 REM data section !105 1210 REM If you would like t o customize this program !23 1220 REM by adding your favo rite crops or changing the ! 147 1230 REM fertilizer rates, e tc., this is where you do it . ! 197 1240 REM The first set of da ta is the crop names. Note t hat they 1050 1250 REM are in the same ord er as the crop menu. If you add more !224 1260 REM crops, you'll have to re-DIMension the appropri ate variables, 1007 1270 REM change the menu sec tion and initialization sect ion. !009 1280 DATA SNAP BEANS, POLE BE ANS, LIMA BEANS, BEETS, BROCCOL I, CABBAGE, CARROTS 1073 1290 DATA CORN, CUCUMBERS, EGG PLANT, LETTUCE, MUSKMELONS, ON I ONS.PEAS.PEPPERS 1094 1300 DATA POTATOES. PUMPKINS, RADISHES, SPINACH, SUMMER SQUA SH, WINTER SQUASH !214 1310 DATA TOMATOES, WATERMELO NS ! 166 1320 REM Next comes the data for wt. of seed required pe r 10 feet of row in oz. !201 1330 REM The assumption is t hat you plant 3X recommended density then thin !231 1340 DATA 1.6,1.0,4,.16,.02, .ØØ6..ØØ72,.264,.Ø27,.ØØ6,.Ø Ø5..Ø1286,1Ø,4 !221 135Ø DATA .ØØ6,35..Ø343..144 ,.Ø48,.Ø18,.27,.ØØ5,.Ø6 !19Ø 1360 REM The next set of dat a statements refers to the s pacing for each of 1090 1370 REM the above crops in inches. !Ø46 138Ø DATA 2-4,4-6,4-6,2-3,18 -24, 12-18, 1-3, 10-12, 12-15, 18 -24 !146 1390 DATA 12,36-48,2-4 !083 1400 DATA 2-3.18-24.8-10.60-90,1,2-4,18-24,36-48,18-24,6 0-90 !225 1410 REM Next are the data f or yield per 10 foot of row. ! 197 1420 DATA 12,15,4,15,10,15,1 Ø,12,12,1Ø,9,11,1Ø,1.5,6,25, 15,3.5,4.5,15,15,25,8 !247 1430 REM Next are the data f or the units of the above. ! 152 1440 DATA LBS., LBS., LBS., LBS .,LBS.,LBS.,LBS.,EARS,LBS.,L BS., HEADS, FRUITS ! 203 1450 DATA LBS., PINTS, LBS., LB S.,LBS.,LBS.,LBS.,LBS.,LBS., .LBS,FRUIT !246 1460 REM Here are the fertil

izer rates for a 10-foot row in terms of manure !0591470 REM in pounds. !120 148Ø DATA Ø4,Ø4,Ø4,15,12,12, 10, 15, 10, 10, 10, 10, 15, 05, 12, 2 Ø, 1Ø, 1Ø, 15, 1Ø, 1Ø, 1Ø, 1Ø ! 25Ø 1490 REM Here are the fertil izer rates for a 10-10-10 ch emical fertilizer !209 1500 REM formulation (for a 10-foot row as well) in cups . !Ø73 1510 DATA .25,.25,.25,.5,.5, .5, .5, .5, .5, .5, .5, .5, .5, .25, .5,.5,.5,.5,.3,.5,.5,.5,.5 ! 2Ø2 152Ø REM! 154 153Ø REM! 154 154Ø REM! 154 1550 REM! 154 1560 FOR I=1 TO 23 !109 157Ø READ C\$(I)!18Ø 1580 NEXT | !223 159Ø FOR I=1 TO 23 !1Ø9 1600 READ O(1):156 161Ø NEXT | !223 1620 FOR I=1 TO 23 !109 163Ø READ S\$(1)!196 164Ø NEXT | !223 1650 FOR I=1 TO 23 !109 166Ø READ Y(I)!166 167Ø NEXT I !223 168Ø FOR !=1 TO 23 !1Ø9 169Ø READ U\$(1)!198 1700 NEXT | !223 171Ø FOR I=1 TO 23 !1Ø9 172Ø READ F1(I)!196 173Ø NEXT | !223 1740 FOR I=1 TO 23 !109 1750 READ F2(1)!197 176Ø NEXT 1 !223 177Ø RETURN ! 136

READER TO READER

Lewis Turner writes:

I have a special need for my TI99/4A computer. This need is to monitor temperature, air and soil in a greenhouse, monitor moisture of soil and monitor light and the quality of light. The data gathered should be able to be stored for later retrieval or printed on a printer as it is gathered.

The next need is to use the computer to control switches for light, controls for heating circuits in soil and valves for misting or watering.

The above needs concern themselves with more than one function in monitoring as well as control. If anyone has performed similar tasks with the computer, I would appreciate learning how it is accomplished, and how to program the computer to talk to the peripherals and receive data from them. I have seen the concepts in various texts, but am confused as to how to directly tie into the TI99/4A computer.

Write Turner at 18 John St., West Warwick, RI 02893.

Réal Doré writes:

I recently purchased an RGB Monitor, a Magnavox Model 8CM515. I'd like to know how to connect it to a Mechatronic 80-column card. The Mechatronic outputs a composite signal for the horizontal and vertical synchronization but the monitor has separate input for the vertical sync and horizontal sync. I connected the composite output to the horizontal sync, it works but I can't use the color, sharpness and hue ad(See Page 35)

Making music

How do they get so much music on one disk?

By BRUCE HARRISON ©1990 Harrison Software

Recently, Harry Brashear reviewed some of our music programs in this magazine, and in his review, asked a pointed question: "How do they put so much music on one disk?

We wrote a letter of thanks to Harry for his kind words about our music, and included a short explanation of how we do that. Our "record," for now, is about 90 minutes of music, plus on-disk documentation on one DSSD disk. We'll try here to explain in some detail how that's possible.

The first part of the "secret" is, of course, doing all the music in assembly language, which makes the most efficient use of memory space in the computer. The second part is in making the assembly code appear to be part of an Extended BASIC program, so that it gets stored to disk in "program" (or memory image) format.

MUSIC IN ASSEMBLY LANGUAGE

We'll start with the business of doing the music in assembly language. In the TI Editor/Assembler book, a whole chapter is devoted to sound, and the method recommended by TI is to create "sound lists" in main memory and to put these bytes in VDP RAM, then let the VDP produce the sound through the generators. Unfortunately, the timing of sound durations by the VDP is done using its vertical interval as the clock. This means that the timing is all done in 60ths of a second, and that proved to be a killing limitation for the ornaments in the music, particularly for the Baroque and Galante music we wanted to create. In other words, one cannot properly execute 64th-note triplets when the smallest duration for either a note or a rest is 1/60th of a second.

Fortunately, another method of doing things in assembly is mentioned in passing by TI in that giant book. That is the method of passing sound bytes directly to the sound generator chip at address Hex 8400. TI, of course, points out that when you do this, you must use your own timing loop to control the duration of the sound. This turned out to be the main ingredient of our success. We soon found out that our timing loop, even with purposeful time-

wasting operations built in, would have to execute more than 200 times for a 64th note at a *presto* pace. This gave us the flexibility to execute all the ornaments flawlessly.

The concepts of musical ornaments and their correct execution meant nothing to our chief programmer. Bits, bytes, words and hexadecimal numbers are meaningful to him Fortunately, we have a two-person team here at Harrison Software, with one member being Dolores P. Werths, a musician.

Of course the concepts of musical ornaments and their correct execution meant nothing to our head programmer. Bits, bytes, words and hexadecimal numbers are meaningful to him, but not turns, triplets or mordants. Fortunately, we have a twoperson team here at Harrison Software, with one member being Dolores P. Werths, a musician.

Our roles are complementary in the ordinary sense of that word. What one knows about programming in assembly mates up neatly with what the other knows about music. This "mating" of skills led to a method for creating music which we believe is unique to our operation. We set up a couple of source files which are nothing but EQUate statements. One of these, common to all our programs, is the "Notes" file, which establishes mnemonic labels for all the notes we actually use on each generator, plus the volumes for each generator. The value for each equate is the hex code taken right from the E/A book, but the label is set up to be in quasi-musical notation. Thus, the musician can create data files with simple mnemonics which the assembler puts together as the hex values which the sound generator understands. The musician can write:

DATA D31,G22,A13 BYTE V31,V52,V43 This means a third octave D is to be played by generator 1, a second octave G is played by generator 2 and a first octave A is played on generator 3, with volumes 3 for generator 1, 5 for generator 2 and 4 for generator 3.

A similar approach is used for the durations of notes, using a file unique to each piece of music, called the "Tempo" file. A typical "Tempo" file looks like this:

TEMP	EQU	250	(RANGE 4-2000)
SX	EQU	TEMP	(64th Note)
T	EQU	TEMP*2	(32nd Note)
S	EQU	TEMP*4	(16th Note)
E	EQU	TEMP*8	(8th Note)
Q	EQU	TEMP*16	(Quarter Note)
Н	EQU [.]	TEMP*32	(Half Note)
TS	EQU	E/3	(Triplet 16th)
TT	EQU	S/3	(Triplet 32nd)

Thus all the durations are derived from a single programmer entry. Notice that the range of possible values for TEMP is very broad, but values below 200 make the music very fast indeed, while values above 400 make for truly "dirge" playing.

With these two files to establish the mnemonics, our musician can create a series of data files directly from the sheet music, and, when assembled, these make a compact expression in hex of the musical content of a composition.

Two more ingredients in our music programs besides the data and the mnemonics are what we call the "Action" file and the "Subs" file. The action file provides pointers into the data and calls the appropriate subroutine to play that section of the music. We take advantage of another small economy of memory in the action file, in that many pieces of music (most, in fact), have repeats of sections of the score, or even *Da Capos*, which repeat the entire score. We accomplish these repeat playings by using simple register counts in the action file. Part of an action file might look like this:

	LI	R4,2
P003	LI	R9,M003
	LI	R13,E012
	BL	@LDMEAS
	DEC	R4
	JNE	P003
		(See Page 32)

MAKING MUSIC—

(Continued from Page 31)

This means that the subroutine (LDMEAS) will "play" all the music between label M003 and E012 in the data file, then decrement register 4, and if that's not zero, play it again (one repeat in this case). Doing it this way may save us thousands of bytes of memory over the course of one movement of a sonata.

By allocating several registers to these loop counts, we can do rather tricky nested loopings to maximize our "bang for the buck" in memory usage.

The other ingredient, the "Subs" file, may be thought of as a musical instrument. In there, we not only time the duration of playing, but can manipulate both the volume and the note values while a note executes. For example, our "Piano" subroutine provides a simulated exponential decay of the volume during the playing of each note, while our "Flute" provides a vibrato by varying the frequency during the playing of a note. Neither of these concepts will work with the "sound list" method, because 1/60th of a second is simply too long a time to wait for our next access to the generator. In our direct feed method, we have hundreds of chances to change what the generator is doing even while a 64th note is playing.

PLAYING TEMPO

We said earlier that our musician is able to create the data files directly from sheet music, and that's true, but that only provides a "working draft" of the composition. Consider the matter of playing tempo, for example. Our resident musician is careful about the markings given on the sheet music, and sometimes takes many attempts at the tempo number before she's satisfied that the music is being played allegro assai and not presto, or vice versa.

This musical integrity is one thing we insist on, and it's yet another reason that our music is a team effort. Many of the music programs we've seen by others have all kinds of superb graphics and special effects of one kind or another, but they are lacking the musician's touch, in that the rhythms are inaccurate, or the various ornaments are improperly executed. For us, that detracts from the enjoyment of the music. In all fairness, many of these are actually programmed in BASIC or Extended

BASIC, so not all the musical faults can be laid at the programmers' feet. We know from our own experience that it's sometimes impossible to get "CALL SOUND" to do what you really want.

ONLY 28 DECIBELS

Of course, there's more to the musician's touch than just timing. There's also the matter of dynamics and musical balance to consider. The dynamics are, of course, not anywhere near the available range of real musical instruments. The total range available on the TI sound generators is only 30 decibels, and because of the way we use volume settings, we are limited to only 28 decibels. Even so, we can produce dramatic changes in volume. Our resident musician is careful in the use of large swings in volume. Rarely do the scores call for maximum forte or minimum piano.

Having a musician 'on staff' here has made all the difference in the music we create. On occasion, she even finds mistakes in the printed scores, and with her knowledge of music is able to correct them.

For that matter, some of the sheet music we use gives no indication of dynamics at all. In some of those cases, we can listen to recordings of the music played by firstrate musicians, and try to emulate their style. In the Nutcracker Suite, for example, many cues were taken from a recording by the Philadelphia Orchestra under Eugene Ormandy. Of course, many recordings of that work could be used for guidance. In the cases of such works as Johann Christian Bach's sonatas, Opus V and XVII, no recordings are readily available, so the musician must study other works by that composer carefully, to get the sense of how the composer would wish to have his music played.

Having a musician "on staff" here has made all the difference in the music we create. On occasion, she even finds mistakes in the printed scores, and with her knowledge of music is able to correct them. Sometimes the publisher or editor has misinterpreted an ornament indication, or even put in a wrong note. Being able to detect and correct such errors makes our music sound better.

In much of the music we do here, the ornamentation is indicated simply by markings, and it is left to the performer to interpret the markings in a correct musical manner. Our musician has studied all this with great care, so that the actual playing of the ornaments is appropriate for its musical context. She often has to resort to working out the timings on graph paper, to make sure that the notes in the ornamentation work out properly timed with the longer duration notes in the bass line.

One of the more challenging instances was in the Nutcracker Suite, where Tchaikovsky had a tied group of seven notes in the space of one quarter note. The timing for that had to be worked out on a grid on which each square represented 1/28th note. Fortunately, once the timing had been worked out, the numbers could be expressed directly in the source file so that the assembler did the calculations of the actual durations. For example, if a note needs a duration of one seventh of a quarter note, we can simply enter Q/7 in a data statement, and let the assembler take the value assigned to Q and divide that by seven. Of course, there is some "rounding error" in the calculation, since the assembler works only in integer numbers, but the effect is minimal because the numbers are large enough. The value for a quarter note is somewhere around 3800, so dividing by seven and leaving off the part beyond the decimal point is not a noticeable difference when the music is playing.

MASTER SOURCE FILE

To put a piece all together, we use a master source file, which copies all the necessary parts into one object file, like this:

COPY "DSK.2NOTES"

COPY "DSK2.TUNET" (TEMPO)

COPY "DSK2.TUNEP" (SCREEN DISPLAY)

COPY "DSK2.TUNEA" (ACTION)

COPY "DSK2.TUNE1" (1st DATA FILE) COPY "DSK2.TUNE2" (2nd DATA FILE)

(See Page 33)

MAKING MUSIC—

(Continued from Page 32) (REPEAT FOR AS MANY DATA FILES AS NEEDED) END

Once all the parts are there, we have an object file that can be loaded and run using the E/A module, but this is, of course, just an intermediate step. Our final product is something which looks like an Extended BASIC program. To do that requires several crucial steps.

MAKING IT LOOK LIKE XBASIC

First, we must make some minor changes in the "P" file, such as substituting EQUates for REFs, adding the >60 offset to characters we write to the screen, and so on.

Next, we assemble into an uncompressed object file, and bring that object file in with the editor. The beginning record of that file has in its first field the length of the program (in hex) when loaded into memory. We write that number down, then get out our hex calculator. Let's say, for example, the length was >0A5C. We enter the magic number >FFE6 into the calculator, and subtract >0A5C. That gives us the answer >F58A. This will be the absolute origin which we'll put in our source code.

We also make sure that that is also the entry point of our code, even if all that instruction does is branch to another label. We write down that number, then subtract >10 from it, to get another number, >F57A. This number will be used to set the line number table location in Extended BASIC.

After we've put the absolute origin in our source code, we assemble again to an uncompressed object file. This is the file we'll load under Extended BASIC. First, however, we must do some more with our two numbers. Since we're going to "poke" those under XB, we must separate the numbers into two bytes and convert the bytes to decimal equivalents. Thus >F57A becomes 245,122, and >F58A becomes 245,138.

Now we go into Extended BASIC, execute a NEW command, then a CALL IN-IT. Now we set the line number table to our "phony" location by executing a CALL LOAD(-31952,245,122,245,122), thus making the beginning and end of the line

number table the same location, with no program present. Next, we type in a short XB program:

100 CALL INIT :: CALL LOAD(8192,2 45,138)

110 CALL LINK("ANY")

Now, with that short program in place, we go back to command mode, and type in CALL LOAD("DSK2.TUNE"). The XB loader puts our assembly object file into memory at locations *above* our short XB program. Now we simply execute a SAVE DSK1.XBTUNE. This saves our XB and assembly as one program file.

Before we go on. I should explain that first line of the XB program above. That line clears out any old link program names, then pokes the address of our assembly program to >2000, or memory location 8192. After a number has been poked to that address, the next CALL LINK executed will link to that location regardless of what name is given in the link statement, and in fact no program name needs to have been defined. Therefore the CALL LINK("ANY") in line 110 could just as well be CALL LINK("ANY"), or any name we like, with the same result, which is an instant switchover to our assembly program.

Saving our assembly program in this way, "submerged" under an Extended BASIC program makes it take about half the disk space of a *compressed* object file under E/A. That is so because we're saving the exact memory image, and don't

need any object tags or other extraneous material. One other advantage is that only that one time do we have to endure the painfully slow XB loader for the tagged object file. Once it's submerged, the file loads just as quickly as any XB program.

One other step which I haven't mentioned is the business of "PLAY ALL" from our menu. For that, we add a line 120 to our XB part of the program:

120 CALL PEEK(10118,A) :: IF A=21 THEN RUN "DSK1.XBTUNE2" ELSE RUN "DSK1.LOAD"

That line looks in location 10118, and gets the number of the selection that was made from the menu, which, of course, our menu program has poked there. In this example, 21 equals the "PLAY ALL" option, so if A=21 we run the next tune in this series, if not, we go back to run our menu (DSK1.LOAD). That location, 10118, just happens to be an out-of-the-way location in low memory, which neither our programs nor Extended BASIC tampers with, except when we want to poke and peek there.

And that, friends, is how we manage to put so much music on one disk. If you have further questions, please write us at 5705 40th Place, Hyattsville, MD 20781.

Or, for more immediate interaction, call us at (301) 277-3467. We'll be happy to talk to you, any time up until about midnight Eastern time.

1990 TI FAIRS

FEBRUARY

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

MARCH

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

APRIL

Canadian TI-FEST, April 28, Merivale High School, Nepean, Ontario, Canada. For information, contact Ruth O'Neill, 34 McLeod St., Ottawa, Ontario, Canada K2P 0Z5 or (613) 234-8050 or CompuServe 72l17,354l or Delphi REON.

MAY

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

Annual Met of T199/4A Users Group UK, North Gate Arena, Chester, England (subject to confirmation). Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

User groups and others planning events for TI/Geneve users are encouraged to send information for inclusion in this event listing. Send information to: MICROpendium Fairs, P.O. Box 1343, Round Rock, TX 78680.

Fun and games with subprograms

TRAFFIC COP

It's time to have a little fun, and see what can be done with the use of subprograms in Extended BASIC.

The program listed below originally appeared in the newsletter of the TI User Group of Perth, Western Australia. We're not certain of the author.

The object of the game is to direct traffic at an intersection. Four cars approach the intersection from four directions and it is your job to see that they don't collide. You do this by controlling their velocity by using the arrow keys. After each safe pass the speed of the cars increases by two miles per hour, making the task increasingly difficult. You are permitted 10 crashes before your traffic cop is "retired."

In addition to being fun to play, the program is a fine example of the use of sub-programs. It is nicely structured and should give you plenty of ideas about incorporating subprograms into your own Extended BASIC efforts.

TRAFFIC COP

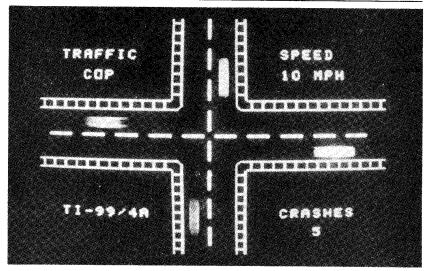
100 CALL CLEAR !209 110 REM ********* ! 048 120 REM * ! 174 13Ø REM * TRAFFIC COP * !Ø79 140 REM * ! 174 150 REM ******** !048 160 PRINT "* TRAFFIC COP *" 1007 170 ! EXTENDED BASIC !118 180 CALL MAGNIFY(3)!224 190 CALL GRAPHICS ! 190 200 CALL INSTRUCTIONS 1038 210 CALL CLEAR !209 22Ø SP=8 :: CR=Ø !Ø48 23Ø CALL SETUP(SP)!Ø11 240 CALL CARS(SP)!162 250 CALL COINC(ALL,H):: IF H THEN CALL CRASH(CR)ELSE 280 1104 26Ø CALL SOUND(-1ØØ,1ØØØ,5)! 270 IF CR>9 THEN 350 ELSE 24 Ø !237 28Ø CALL KEY(3,K,S)!19Ø 290 CT=CT+1 :: IF CT>75 THEN CALL FASTER(CT,SP,BST)!Ø16 300 IF K=83 THEN CALL MOTION

(#1,0,0)ELSE CALL MOTION(#1, Ø.SP)!151 310 IF K=68 THEN CALL MOTION (#2,0,0)ELSE CALL MOTION(#2, Ø.-SP)!Ø94 320 IF K=69 THEN CALL MOTION (#3,0,0)ELSE CALL MOTION(#3. SP,Ø)!159 33Ø IF K=88 THEN CALL MOTION (#4,0,0)ELSE CALL MOTION(#4, -SP,Ø)!1ØØ 34Ø GOTO 25Ø !Ø73 35Ø CALL CLEAR !2Ø9 36Ø DISPLAY AT(6,1): "YOU CAU SED 10 CRASHES, WITH" !070 370 DISPLAY AT(8,1):"THE TRA FFIC RUNNING AT" 1053 38Ø DISPLAY AT(10,1):SP;"MPH "!146 390 DISPLAY AT(12,2): "BEST S PEED SO FAR IS"; BST; "MPH" !1 60 400 DISPLAY AT(16.6)BEEP:"PL AY AGAIN? (Y/N)" !153 410 CALL KEY(3,K,S):: IF S=0 THEN 410 !226 420 IF K=78 THEN END !001 43Ø IF K<>89 THEN 4ØØ !147 440 CALL CLEAR :: GOTO 200 ! 106 450 SUB GRAPHICS !194 460 CALL SCREEN(2)!147 47Ø CALL CHAR(128,"FF1Ø1Ø1Ø1 Ø1Ø1ØFF")!Ø66 48Ø CALL CHAR(129,"818181FF8 1818181")!Ø8Ø 49Ø CALL CHAR(13Ø,"Ø1Ø1Ø1Ø1Ø 1Ø2Ø4F8")!ØØ6 500 CALL CHAR(131,"808080808 Ø4Ø2Ø1F")!Ø35 510 CALL CHAR(132,"1F2040808 Ø8Ø8Ø8Ø")!Ø36 520 CALL CHAR(133,"F80402010 1010101")!009 53Ø CALL CHAR(136,"ØØØØØFFF F")!Ø21 540 CALL CHAR(137,"181818181 8181818")!Ø44 55Ø CALL CHAR(96."ØØØØØØØØ7F FFF3F3F3F3FF7FØØØØØØØØØØØØØØØ ØØØFFFE1F1F1F1FFEFF")!144 560 CALL CHAR (100,"00000000F F7FF8F8F8F87FFFØØØØØØØØØØØØØØØ

ØØØFEFFCFCFCFCFFFFE")!222 57Ø CALL CHAR(1Ø4,"Ø8ØFØFØFØ FØCØCØCØFØFØCØCØFØFØFØ7DØFØF ØFØFØ3Ø3Ø3ØFØFØSØ3ØSØFØFØFØEØ")!064 580 CALL CHAR (108, "070F0F0F0F CØCØFØFØCØCØCØFØFØFØFØ8EØFØF ØFØ3Ø3ØFØFØ3Ø3Ø3ØFØFØFØFØDØ")!Ø68 590 CALL CHAR(112."014163333 F3F1F1F1F1F3F7B6383Ø3Ø1ØØ818 3C6EEFCFCF8F8F8FCFC9EØ7Ø1")! Ø19 600 CALL COLOR(13,16,2,14,16 .1)!137 61Ø FOR I=2 TO 8 !Ø64 62Ø CALL COLOR(1,16,1)!Ø48 63Ø NEXT | !223 640 SUBEND ! 168 650 SUB INSTRUCTIONS 1042 660 DISPLAY AT(10,8):"TRAFFI C COP." !149 67Ø DISPLAY AT(13,2):"DO YOU WANT INSTRUCTIONS?" !142 68Ø DISPLAY AT(15,11)BEEP:"(Y/N)" !164 690 CALL KEY(3.K.S):: IF S=0 THEN 690 !251 700 IF K=78 THEN CALL CLEAR :: GOTO 78Ø !Ø39 710 IF K<>89 THEN 680 !172 720 CALL CLEAR !209 730 DISPLAY AT(4,2): "USE THE ARROW KEYS (E,S,D,X)" !Ø96 740 DISPLAY AT(6,3):"TO STOP THE TRAFFIC AND" 1092 75Ø DISPLAY AT(8,1):"PREVENT COLLISIONS. WHEN TEN" ! Ø15 76Ø DISPLAY AT(10,3):"CRASHE S HAVE OCCURRED YOU" !079 770 DISPLAY AT(12,2): "WILL B E REMOVED FROM DUTY." !105 78Ø DISPLAY AT(18,4):"PRESS ANY KEY TO PLAY." !Ø89 79Ø CALL KEY(3,K,S):: IF S=Ø THEN 790 1096 800 SUBEND ! 168 81Ø SUB SETUP(SP)!Ø15 820 DISPLAY AT(4,1):"TRAFFIC "!Ø43 830 DISPLAY AT(6,3):"COP" !0 14 (See Page 35)

TRAFFIC COP—

(Continued from Page 34) 840 DISPLAY AT(4,21): "SPEED" 1206 85Ø DISPLAY AT(6,2Ø):SP;"MPH "!152 86Ø DISPLAY AT(2Ø,1):"TI-99/ 4A" !Ø6Ø 870 DISPLAY AT(20,21): "CRASH ES" ! 151 88Ø CALL HCHAR(9,1,128,32)!2 31 89Ø CALL HCHAR(15,1,128,32)! Ø21 900 CALL VCHAR(1,13,129,24)! Ø35 910 CALL VCHAR(1,19,129,24)! Ø41 92Ø CALL VOHAR(1,14,32,12Ø)! Ø26 93Ø CALL HCHAR(1Ø,1,32,16Ø)! Ø12 94Ø CALL HCHAR(9,13,13Ø)!Ø5Ø 95Ø CALL HCHAR(9,19,131)!Ø57 96Ø CALL HCHAR(15,13,133)!Ø9 97Ø CALL HCHAR(15,19,132)!1Ø 980 FOR I=2 TO 30 STEP 3 102 990 CALL HCHAR(12,1,136,2)!0 44 1000 NEXT | !223 1010 FOR I=1 TO 22 STEP 3 !0 1020 CALL VCHAR(1,16,137,2)! Ø63 1Ø3Ø NEXT I !223 1040 SUBEND !168 1050 SUB CARS(SP)!166 1060 IF SP>20 THEN SP=SP-4 ! 1070 DISPLAY AT(6,20):SP;"MP H" !152 1080 CALL SPRITE(#1,96,14,75 .1.Ø.SP)!Ø12 1090 CALL SPRITE(#2,100,16,9 8,25Ø,Ø,-SP)!Ø97 1100 CALL SPRITE(#3,108,6,1, 128,SP,Ø)!Ø57 1110 CALL SPRITE(#4,104,3,19 Ø,1Ø5,-SP,Ø)!Ø91 1120 SUBEND !168 1130 SUB CRASH(CR)!225 1140 CALL MOTION(#1,0,0,#2,0 ,Ø,#3,Ø,Ø,#4,Ø,Ø)!ØØ9 115Ø CALL SPRITE(#9,112,9,88



.120)!115 116Ø CALL SPRITE(#1Ø,112,12, 88, 120, 5, 5, #11, 112, 12, 88, 120 ,-5,-5)!219 117Ø CALL SPRITE(#12,112,12, 88,120,5,-5,#13,112,12,88,12 \emptyset , -5, 5)! 223 1180 FOR I=0 TO 20 !105 119Ø !!131 1200 CALL SOUND(-200,-7,1,11 $\emptyset, 1+5)!187$ 121Ø CALL COLOR(#9,12)!Ø53 122Ø NEXT I !223 123Ø CALL DELSPRITE(ALL)!115 124Ø CR=CR+1 !163

125Ø DISPLAY AT(22,23):CR !Ø 89 126Ø SUBEND !168 1270 SUB FASTER(CT,SP,BST)!0 42 128Ø CALL SOUND(2ØØ,-2,Ø,5ØØ .5)!157 129Ø SP=SP+2 !192 1300 IF SP>BST THEN BST=SP ! 202 131Ø CT=Ø !Ø78 132Ø DISPLAY AT(6,2Ø):SP;"MP H" ! 152 133Ø SUBEND !168

READER TO READER

(Continued from Page 30)

justment buttons. Is there any way to separate the output composite sync from the 80-column card? I'd also like to know where to get Edgar L. Dohman's Superbug II program, the version with the 52-page manual. I wrote him twice but received no answer. I am also searching for the template file called BNKOSRC that can be used in creating the memory image files that get loaded into Super Space memory by the BNKLDR program. DataBioTics sent a new disk but the file was unreadable We sent a new letter to DataBioTics but no answer so far.

Is there any place where I can find out programs that can be loaded in Super Space and use 8K or 32K with bank switching?

Write Doré at 575 Ave. Glazier, Ville-Vanier, Québec, Canada GlM 3A8.

Denver Earl Sullivan writes:

I own TI-Artist Plus! as well as a Mechatronic TI mouse. However, when I install the TI-Mouse Device Service Routine MECHA from TIA+ Disk 3 the "rubber band" lines of the drawing package as well as those of the other Artist Modules vanish, making drawing, chaling, vectoring etc. extremely difficult if not impossible. I would appreciate ANY help in correcting this annoying error in the MECHA-S sourcecode. I am not an assembly language programmer and would greatly appreciate it if someone could please send me a documented listing of the changes that need to be made in order to correct this flaw. The joystick driver works correctly. Write Sullivan at 314 North Sycamore St., Osgood IN 47037.

Reader to Reader is a column to put TI99/4A and Geneve 9640 users in contact with other users. Be sure to address it to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680. **TRIS**

Strategy, action and very quick

By JOHN KOLOEN

Tris, by Jim Reiss, is a fast-moving game that will test the hand-eye coordination of the most able computer jock. It is based on a game that originated in the Soviet Union and has been widely marketed for PCs, other computers and game players. MICROpendium published a relatively simple Extended BASIC version called TetrIs in the September 1989 edition.

Asgard's Tris is available on cartridge for the 99/4A and on disk for the Geneve 9640. The version reviewed here runs on the Geneve out of MDOS. In other respects it is the same as the 99/4A version. Both are programmed in assembly language.

Performance: The object of Tris, of course, is to line up shapes at the bottom of the screen in such a way that they form a solid pattern. The lower part of the screen is then scrolled off to be replaced by another row of blanks that will eventually be filled in.

The playing area consists of an area of about 18 rows deep and 10 columns wide. Within these boundaries the game is played.

Variables include a variety of shapes that must be fitted into the pattern as well as the speed with which they descend. This version of Tris also gives you an option to preview each shape before it drops so that you can plan a location for it. Very handy, indeed (though I don't consider it cheating).

Fortunately, Tris lets you select the difficulty level — and there are 10 levels. After selecting a level (0-9), you may turn the preview on and select from one of two sets of input keys, depending on which set you find the easiest to use. A fourth option, called *height*, randomly places blocks up to the level (0-9) you select. "Selecting a level other than zero gives you the added challenge of not only keeping up with falling blocks but also removing the ones already there by filling rows," according to the manual. This is something a relatively accomplished player would do. But not this reviewer.

Once the game starts, and using the input keys, you manuever the falling shapes to fit into openings at the bottom of the

Review

Report Card

Performance	
Ease of Use	
Documentation	
Value	
Final GradeB-	۲

Cost: \$24.95 + 75 cents S&H (\$1.25 Canada)

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

Requirements: Geneve and disk system or TI99/4A console.

screen. Once it is in position, you can press the Enter key to cause it to drop quickly, which scores points based on the height the piece is dropped from. The higher the piece, the greater the number of points. After the piece falls into place, another piece drops from the top of the screen and you continue the process until the game is over or you go crazy — whichever comes first.

Playing Tris successfully requires the skills of an arcade game player with those of a tactician. I found it challenging at level

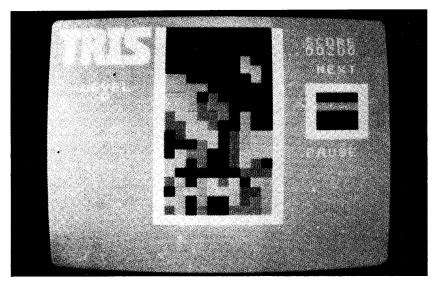
0, which gives you an idea of how accomplished I am. Even then, I was glad to have access to a pause key. But, at the lower level, I found it to be enjoyable. I didn't feel frustrated, because I did achieve a small amount of success.

The game uses color and sound and is as simple to learn as tic-tac-toe and as difficult to master as Rubik's cube.

Documentation: The manual consists of an 8½ x 11 sheet of card stock folded in half. It is logically designed and produced on a laser printer. While it addresses the technical aspects of playing quite well, I wish it offered a few tips on how to play the game and, especially, whether there really is a winning strategy.

Ease of Use: The game loads automatically and is fully prompted. It couldn't be much easier to use.

Value: The asking price for Tris is in the same ballpark as variations of the program offered for PC and game player users. It is more expensive than most recent TI game offerings, but most recent games are shareware rather than commercial software such as this. I can't tell you how it compares with versions that run on other machines, but is well done. If you are into arcade action and strategy it is definitely worth consideration.



THE PRINTER'S APPRENTICE (GENEVE VERSION)

Talkin' about a revolution

By DOUG PHELPS

This is what the Geneve was made for. A powerful, revolutionary program with hires graphics, fast, completely WYSIWYG, and entirely memory resident along with the page (or pages) you are working on. I am talking about the new MDOS version of the popular 99/4A program, "The Printer's Apprentice."

TPA is a pagemaking program which allows the user to place graphics, format text, and draw on a full-length, doubledensity page. The screen is a 512 x 192 pixel window onto the full 1023 x 767 page.

TPA allows you to use a variety of artwork and fonts. You may use TI-Artist pictures and instances, and, of course, TPA screens. For fonts you may choose from TI-Artist (any size), TPA fonts, and CHARAI type fonts. You may also use custom CHARA+ fonts for use as patterns in the flood fill.

Performance: When you purchase TPA, you receive a "flippy" disk containing the program, three TPA fonts, a CHARAI font, and a CHARA+ font especially for patterns on one side, and a sample TPA screen on the other side.

TPA allows you to have an unlimited number of graphics on the page and an unlimited number of any mixture of fonts from any of the possible sources. You may have only one font in memory at a time, but that font's size may be increased several times (for titles perhaps).

When TPA is booted, (it takes about 28 seconds on my disk formatted with the excellent Hypercopy) a sparse screen appears with several selections which may be chosen by the pressing of its first letter. Pressing "A", for artwork, takes you to the screen where art is loaded and save, (any portion, or all of the page may be saved in TPA format only).

Choosing "Fonts" — any font can be loaded in five keystrokes or less by paging through the file names listed with the directory function. Also on the font screen, the CHARA+ pattern may edited to taste and saved in a custom file for use in the fill option (64 fill patterns are included).

"Colors" allows you to adjust the

Reviews

Report Card

Performance	+
Ease of UseA	
Documentation B	
Value	+
Final GradeA	

Cost: \$22.50 (includes shipping) Manufacturer: McCann Software, P.O. Box 34160, Omaha, NE 68134 Requirements: Geneve 9640

foreground, background, and cursor colors. (Color is not provided in page creation).

Selecting "Jotter" takes you to a mini TI-Writer-like word processor. Display/Variable 80 files may be loaded, saved, and edited in lengths up to 100 lines. The text created or loaded into the Jotter is what is used for formatting text on the page. It is important to remember that where the cursor is left when the Jotter is exited, is where formatting begins. This is useful when formatting multiple columns. When the formatting is finished in one column, merely place the cursor on the word after the last word in the column just formatted, in the Jotter buffer.

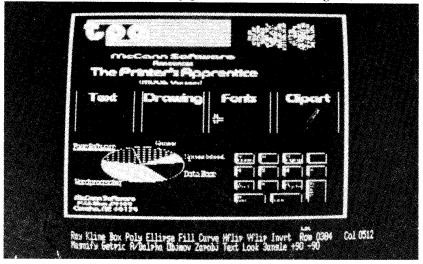
Selecting "Draw" takes you to the page

creation screen. TPA actually has two pages in memory at one time, a front and a back page. The front page is what is usually printed out and the back page is where your graphics are first loaded, before cutting and pasting onto the front page. Another menu is present at the bottom of the screen, with a Row and Column display which keeps track of the cursor location to the pixel. After a selection from the menu is made (by pressing the first letter of the option), the arrow keys are used to move the cursor (no provision is made for joystick or mouse use) one may draw rays, continuous lines, boxes, polygons, circles, ellipses, curves and more.

Other options provide for horizontally or vertically flipping portions of the page, rotating parts of the page, moving or copying parts of the page, erasing parts of the page, magnifying part of the page, and even viewing a reduced full page representation of the whole page. The full page is represented by displaying every other line horizontally, and every fourth line vertically.

Text may be formatted anywhere on the page, centered, right margin justified, and either left or right margin ragged, in as many columns as you wish. After selecting the text option, a box is opened by "anchoring" the upper left corner with the "insert" key and pulling it open to the desired size.

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TPA-

(Continued from Page 37)

Pressing enter formats the text in Jotter inside the box to its limits in the currently loaded font. Formatting, say, a Jotter full of text to a full page may take a couple of minutes. But, no extra program is needed. It is all done at MDOS speed before your eyes. Small amounts of text may be entered with the A/Dalpha option without using the Jotter. This is useful for typing titles or labels.

Graphics are used by first loading them onto the back page, and then cutting and pasting them anywhere on the front page. The procedure is much like formatting text on the screen. After loading the graphic (picture, instance or screen) you open a box on the front screen which will be large enough to hold it by anchoring the upper left corner with the "insert" key and opening it to the desired size. Once a picture is loaded and placed on a page, that's it. The graphic may be copied or moved anywhere on the page. You may remove the disk and forget about it. Everything on the page is saved as one file. This can make for a large file (anywhere from a few sectors to slightly over 360 sectors), but I prefer it over the method of saving a page, and merely saving the disk location of each graphic that the otherwise excellent Page Pro 99 uses.

No matter how good a page creation program is, it eventually has to be printed or it's of little use. Printing from TPA allows many options. It may be printed on an Epson or Gemini 10X, in single, double- or quad-density, single or double-strike, in portrait or landscape. Any portion, or the entire page may be printed.

Using the Cpixel editor, the size and and shape of the pixel may be altered. If the pixel is edited to print four pixels for every one on the page, the page would print out four times as large. Of course, a full page will not fit on a page if it is enlarged four times. But, an instance along with a little text could be enlarged this way for good effect.

After entering your printer device name (PIO.CR, etc.), choosing the "Goprint" option will cause the part of the screen you chose to print out. Additionally, advanced users may use an option where both the front and back screens are printed side by side with the quad-density option.

Documentation: The documentation is a well-done booklet done entirely with TPA. It could use some more in-depth examples, but it provides enough basic information to allow the user to get started and discover some things on his own. I didn't mind experimenting at all. This is a fun program.

Conclusions: A few things I would like to see in future versions are a pixel editor to allow expansion of artwork on the screen and not just at printout time, and the provision for the use of a joystick or mouse. According to the author, he has had some trouble acquiring a mouse.

The Printer's Apprentice improves on the capabilites of Page Pro 99, combines them with the drawing functions of TI-Artist (and a few of its own), to be the premier page publishing tool in the 99'er world. The programmer has said that this program is the test to see if the Geneve community will support his efforts. At \$22.50, don't let this program get away. It is a must have for every Myarc 9640 owner.

MICRO-REVIEWS

Everything from videos to taxes

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

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

*** FUNNELWEB INSTRUCTIONS (Video)

For all of you who have done battle with the Funnelweb Configuration files, and lost the war, I present Charles Good. Charles has taken the new 4.2 version and made a video documentary on setting up FW.

It starts right out by telling you what all those vague two-letter file names mean, and takes you all the way through the configuration.

Charlie does a heck of a job on narration — although after an hour or so, I could have used some background music. But the tape accomplishes what it sets out to do, getting the Funnelweb system up and running, based on your own needs.

Many features of the configuration files are rough to get through. Almost everybody will benefit from this tape. Paid Lima User Group members or bona fide group librarians can send \$5 and a new blank VHS tape to Charles Good 210, Ohio State University, Lima OH 45804. (Others write for price).

**** TI-TAX

There has already been a major review of this program in the Feb. 1987 issue of MICROpendium, so I won't bother to go over the whole thing again. It's enough to say that this program is worth every penny you spend on it.

First a quick overview for the newcomers to our community, and the ones that need to be hit over the head for convincing.

TI-TAX is basically a series of Multiplan templates that closely resemble (it's scary) the IRS forms. You load these into the Microsoft Multiplan environment and fill out the appropriate lines with your own creative bookkeeping numbers. When you are finished, Multiplan calculates your tax return and all you have to do is dump it to the printer.

A word of warning: You cannot send a signed facsimile to the IRS, so any form that requires a signature is for practice only. Any form NOT requiring a signature can be sent in as is. The author has now included a Form 1040, (and possibly 1040A) Overprint though, so you can slip the official form into your printer and it will fill in the lines. This is a new feature.

Another new addition to the program is a file called INITIAL. This transports mundane information like name, address and Social Security number to each form. That's a heck of a time saver right there.

Since the government tends to make last minute changes in the IRS laws and forms, Bill Chavanne, the author, holds all orders until Jan. 15 and then ships all updates and original orders by Jan. 30. I understand that he has never failed to do this either, a very professional approach.

At this point, there are six packages of forms available: Short Forms, \$20: Long Forms, \$10: Schedules, \$15: Usual Forms, \$15: More Forms #1, \$15: and More Forms #2, \$15. There are a number of forms and schedules in each package that pertain to each other, but I might be inclined to get the first three mentioned for general coverage. Each order must include \$5 for postage and handling, so you save by getting several at once.

You must have the Microsoft Multiplan cartridge to use these templates and also a printer that will do condensed print.

This package has been around since 1983 and it's still going strong. I can't emphasize how professionally it's handled, and that means a lot. The output is so real looking, it gives you the screaming jitters just to hold it in your hand.

Send your money to: William G Chavanne, 4549 English Ave, Ft. Meade MD 20755.

A SASE will get you the complete listing of forms and prices.

**** MAILING LIST MANAGER

*** PUBLICATIONS INDEX

Hey look, I'm getting efficient, two reviews in one!

Bill Gaskill KNOWS how to program command files for TI-Base and he is darn good at it. It therefore stands to reason that he would be a likely victim to go with Texaments and begin knocking out support programs for them.

You must, of course, own TI-Base to be able to use either of these programs. To access them, load TIB as you would normally and type "DO MENU" at the first prompt after the date input. It only takes a few seconds to get the main menu, and after that, it's like handling any user friendly database program. Everything is menu driven and there are screen prompts all over the place to help you through.

Let's look at the Mailing List Manager's main menu.

- A. ADD NEW DATA
- C. CHANGE A RECORD
- D. DISPLAY DATA BASE
- F. FIND A RECORD
- H. HELP SCREENS
- M. MAILING LABELS
- P. PRINT A REPORT
- **U. UTILITIES**
- X. eXit PROGRAM

Each of the aforementioned selections is broken down into sub-menus. (As I said, it's an idiot-proof program.) For instance, when you "add new data" you can select either the normal inverse screen that TIB uses, or, you can bring up a customized screen that spreads your inputs out a little more. The latter may be easier on the eyes for some people.

The Utilities menu allows you to do cataloging, deleting of one or more records, modify your printer driver, etc. Also within this menu is the most unique feature of the program, AUTO-DIAL a phone number. That's right, along with the addresses you put in the phone numbers, then you can

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MICRO-REVIEWS—

(Continued from Page 39)

search them out and have the program dial them for you.

The one thing the docs don't tell you about this is that it works best at 300 baud. I beat my brains out for almost a day until I figured that out. It's a fine program if you own TI-Base, and a Hayes-compatible modem.

You have the ability to print out the complete list on labels, or by single name, or based on a search of ZIP codes too, as well as a report list. Neat Program!

The second program, Publications Index, is equally well done, allowing searches on all fields etc.

It's primary design seems to be for computing articles, and under that heading, perhaps MicroPendium specifically. These are the key codes for article types:

- 01 ARTICLE
- 02 EDITORIAL
- 03 NEWS ANNOUNCEMENT
- 04 PROGRAM
- 05 REVIEW
- 06 TUTORIAL
- 07 USER NOTES

If that doesn't narrow it down, I don't know what does. Frankly, I think we have more than enough of these type of programs right now, but to each his own. It does work faster, better and friendlier than any other one I've seen, so for that reason I'm giving it three stars. I would have liked it a lot better if it had been more generalized. How come they think we TIers are so obsessed with our computers that we think of nothing else? I would like to index my National Geographic magazines.

With that in mind, however, I would like to point out that a bit of knowledge about TI-Base command files will go a long way. If you don't like the way these programs are set up, change them! Just make sure you do it to a copy and not the original. If this sounds like I have a patch over one eye, forget it. The author and Texaments both agree that these programs are as much a learning experience as anything else. Once you've learned, and created your own command files, send your efforts to Texaments and MAYBE you can make some money.

Both programs are \$14.95 each plus shipping. Order from Texaments, 53 Center Street, Patchogue NY 11772, or call their

BBS at; 1-516-475-6463

**** TIPS (TI Print Shop)

I have been a little reluctant to talk about this program up to now, simply because it's status seemed a little unclear to me. That is no longer the case, so here we go.

Never in the history of this community has so much been given for so little. It's free, free, free!

The gentleman who created the system, Ron Wolcott, wants nothing but our thanks and appreciation. He has my thanks many times over.

How come they think we TIers are so obsessed with our computers that we think of nothing else? I would like to index my National Geographic magazines.

Before I get into what the program does, I should tell you that the entire system contains, at this point, approximately 4,000 graphic pictures. They have been ported over to the TI world by Ron from public domain IBM graphics.

As many of you know, I am a real graphics freak, so believe me when I tell you there's no junk in this collection. They are all fabulous art work, and most measure about 10x15 characters, so they aren't small either.

Also included in the graphics system is a batch of fonts. These are used mainly with the TIPS print shop utilities. From the program you cân make banners, cards, flyers, the whole ball of wax.

The only problem here is that the TIPS program is slow, but it's getting better with every new release. The newest version, 1.4, I think, better than doubles the speed of 1.3. I think the big problem here is that one program is trying to do everything, so it needs to be broken down a bit.

Two separate programs are included with the system that view and convert the graphics to Artist instances. These two programs are written in "C" so they work faster than greased lightning.

When I first started to get involved with TIPS, I decided that the first thing I wanted to do was to convert everything to Instance format. I now realize that this was an incredibly stupid idea. You see, each graphic file contains about 100 separate graphics. The file is a compressed format that is incompatible for anything except TIPS, unless you use the converter. Since a program is included to print out sample sheets from the files, all you really need to do is make yourself a catalog. When you need a graphic, just look it up and convert it. This only takes about 20 seconds, so you might as well leave the original format alone.

OK, where to get this ultimate graphics system. It is available on all the networks — GEnie, CompuServe and Delphi — and may even be trickling down to the BBSes by now. If you don't have access to the networks, drop me a line, and I'll figure out a way for you to get it.

Keep in mind, the total system now comprises about six or seven DSDD disks. I expect Jim Peterson or Barry Traver can help you out, also.

PUBLIC DOMAIN CATALOG

Jim Peterson, of Tigercub Software, has completed a new public domain software catalog, #2. You can order it from Jim for \$1, refundable on your first order. The catalog contains the listings of 309 SSSD disks of all kinds of programs.

I know there is a tendency for some people to ignore the PD stuff thinking that it may not be quite the "hotshot" stuff that is being produced these days, but they are wrong. There are a heck of a lot of terrific programs on these disks. Sometimes they don't quite fit the bill, but can very easily be adapted to do so.

A case in point is disk #910, graphs and charts. There are a number of programs on this disk to produce graphs on the screen. I found a beauty that would give me what I needed, and all I had to do was include a screen dump in the XB code. This stuff is worth it's weight in gold.

Send \$1 and a large SASE to Tigercub Software, 156 Collingwood Ave, Columbus OH 43213.

If you would like your software considered for review in this column, send it (with an SASE if you want it returned) to Harry T. Brashear, 2753 Main St., Newfane NY, 14108.

WAR OF THE NETHERWORLDS

Defend your home planet

By KEITH BERGMAN

I read an estimate once that there are as many as 80,000 TI owners with just a cassette player.

Software for these owners, however, has been few and far between of late. As software becomes more advanced, the 16K that seemed like so much in 1979 is now a severe limitation. But interesting programs can be written in this small memory space. Case in point is War of the Netherworlds, a game from Donaldson Software.

In this two-player game, each player starts out on a planet with 100 fighters. The goal is to wipe out the opposing player's fighters. The players take over the 12 moons between their planets, using them as springboards for future attacks and building ships on them. The moons are also sources of materials for battlestars (more on them later). Your fighters can only fly across small areas of space at a time, so the moons are vital for attacking the home planet.

Each moon has a randomly set productivity rate. This rate determines how many new ships are built on the moon each turn. For example, if you have 100 ships on a moon with a 12 percent productivity rate, you will have 112 there on your next turn. The rate seems to vary from 5 to 25 percent, and it is not evenly distributed across the board. This is a weak point of the game, since there is only one 25-percent-productive moon. In my experience, the person with the 25 percent moon usually won the game. (Just think of 100 fighters, then 125, then 156 and so on. It multiplies rather quickly!)

Attacking another player's moon or planet is simply a matter of sending your ships there. There is no Legends-like battle sequence; it is automatically determined and you are shown the numeric totals. It is more exciting than it sounds, particularly when the fight is for an important moon.

Battlestars are the super-weapon of the game. The four moons closest to your planet supply you with material to build your battlestar. Each time you send fighters back to your home planet, more is added to your battlestar. A percentage total is shown on

Review

Report Card

Performance	В
Ease of Use	B +
Documentation	C
Value	A
Final Grade	В

Cost: \$8.95

ada J8L 2C2

Requirements: console, Extended BASIC, cassette recorder Manufacturer: Donaldson Software, 521 Lievre St., Buckingham, Quebec, Can-

the screen and when this total reaches 100 percent, you can launch at any time. The battlestar wipes out everything on the moon you send it to (it can't be used on planets), leaving that moon deserted. This effort sets the battlestar's completion level back down to 60-80 percent, and you must send more materials to your home planet to fix it and re-use it.

Intelsats (intelligence satellites) are also important to the game. They allow you to gather information on any moon in the game, whether yours or the enemy's. They can be blown up only with battlestars, and each player has three. A player without one is at a definite disadvantage, since he cannot see how many fighters are coming to attack him — and, indeed, cannot even see how many fighters he has on his *own* moons!

The game can last for 5 to 95 minutes, according to the documentation, but some games I played lasted considerably longer. A save-game feature would be nice in a game like this, even with the considerable wait that saving on cassette would involve. If no one wins after 59 game-years, there is a danger of the twin suns of your planet going supernova. In this case, the game is a tie. This is a good idea, because, if no one has won by this time, the game is usually heading for a stalemate.

The game is easy to use, after a few minutes of trial and error. It would be much easier, however, if the documentation were any help. The docs are only three pages long (plus a half-page of addenda), and they are unclear on several aspects.

The biggest fault I find with the game is that it is for two players only. I like being able to match wits with the computer. But, in 16K, this may not have been possible. Plus, it's more fun to play games like this with others (and I'd like to thank my friend Matt Barnes for helping me test this game — and wiping me out almost every time!)

Floyd Donaldson has made an interesting game. The fact that he got as much as he did into 16K shows his programming skills. The game doesn't set the world on fire with speed, but it's not so slow as to be annoying. And I would have preferred to buy it on disk, but it's no trouble to blow the dust off the old cassette player, load it once and save it to disk. Other than a few minor quibbles, it's a highly exciting game. I recommend it for anyone who enjoys strategic conflicts.

SeniorNet keeps persons 55+ on line

SeniorNet has 26 sites in 13 states and Canada, where volunteers have trained more than 3,000 persons 55 and older to use personal computers, according to an article in the January 1990 AARP Bulletin, published by the American Association of Retired Persons. SeniorNet, founded in 1986 at the University of San Francisco, is open to persons who are not near the sites if they already know how to use computers. Its online component is on the Delphi telecommunications network. SeniorNet's annual membership dues are \$25. Delphi is accessed by a one-time \$15 fee plus \$6.90 per hour evenings and weekends and \$16.70 an hour weekends. For an additional 30 to 70 cents per hour, members can access Delphi's other services.

For information, contact SeniorNet, University of San Francisco CA 94117-1040, or (415) 666-6505.

Newsbytes

Texaments releases GuideLines program

Texaments has released **GuideLines**, a supplemental graphics support package for T1 Artist PLUS!

GuideLines, a two-disk set, features new fonts, instances, slides and pictures, according to the manufacturer. All but one of the 15 fonts included are complete, with both upper and lowercase letters, numbers from zero to nine and a full set of punctuation characters.

The program includes Banner Borders, described as a type of clipart with which banners can be created using the drawing and printing modules of TI Artist PLUS! GuideLines includes 12 different banner styles as well as a blank template so that custom banners and banner borders can be designed by the user.

Six different templates come with GuideLines to assist users to create personalized calendars, disk sleeves/jackets, standard mailing labels, banners and full page drawings, the manufacturer says. Also included are 17 small instances, two full sets of slides and a numbered full screen position reference template.

GuideLines is available from Texaments for \$9.95 (plus \$2.50 shipping). **Guide-Lines** requires TI Artist PLUS! (also available from Texaments for \$24.95 plus \$2.50 shipping).

For more information, or to order, contact Texaments, 53 Center St., Patchogue, NY 11772, (516) 475-3480 (voice) or (516) 475-6463 (BBS).



BBS relocates

The bulletin board formerly operated in Calgary, Alberta, Canada, by David Lovering has been relocated to Airdrie, Alberta.

New number for the board is (403) 948-5023.

UK group to meet in Chester in May

The TI99/4A Users Group UK has scheduled its annual meeting for 1990 at the Northgate Arena in Chester, England, May 26.

According to Stephen Shaw of the group, this is a preliminary notice, with the date and location subject to confirmation.

Shaw notes that Chester is a historic site, with Roman walls encircling the city, an ancient cathedral, a famous zoo nearby, the River Dee and a canal, the Grosvenor Gardens, a museum and shopping center.

He says the nearest international airport is Manchester. From there, it is possible to take a bus to Manchester Piccadilly railway station and go by train to Chester Station.

"A walk or a bus to the Town Hall," he says, "and then ask for or look for Northgate — it is to the north of the Town Hall! Chester is a very compact city."

Tourist information is available from Tourist Information Centre, Town Hall, Chester, Cheshire, England.

Show information is available from Shaw at 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

Shorock publishes catalog of programs

Don Shorock has released a second catalog of language and other educational fairware.

Shorock notes that his programs are fairware but not public domain freeware. Users ordering copies should send a blank unformatted disk, along with a mailer and postage. Shorock can produce only SSSD format. Fairware contributions may be sent with the order or after the user has used the program.

Foreign users need not send the disk, disk mailer and postage, he says, but should send a larger contribution to cover these items.

His disk ED01 contains three geography, three history, one astronomy and five math programs from elementary to algebra; ED02 contains seven geography and five math programs; ED03 contains two geography and two music identification programs, also chemistry, flags, geology, history philosophy and semaphore code ED04, Inventions; and ED05, Kansa: Geography.

Shorock offers drill programs fo Japanese, Russian and Czech, and vocab ulary filers for Japanese (Kana and Roman ji), Czech, Danish, Finnish, French, German, modern Greek, Hungarian, Norwegian, Polish, Spanish, Swedish, Vietnamese and Latin.

Under development ("ready to go in about two evenings or one day of programming"), are a number of language vocabulary file programs. Shorock notes that an order for one of these would "bump it to the top of the list of those being developed." These are Croatian (Latin alphabet); Czech, Danish, Finnish, French, German, modern Greek, Hungarian, Norwegian, Polish, Spanish (different type of program); Esperanto; Gaelic; classical Greek; Indonesian; Italian; Rumanian; Russian; Serbian (Cyrillic alphabet); Serbo-Croatian (Latin alphabet); Slovak; Swahili; Turkish; and Ukranian.

Programs under development with "more serious work to do" are Japanese Kanji filer, stroke order and bare bones; Arabic; Bulgarian; Hebrew; Icelandic; and Yiddish.

Shorock says some languages are beyond the machine's capabilities, incuding Thai and most Southeast Asian languages besides Vietnamese, as well as the languages of India.

For information or to order, write Shorock at P.O. Box 501, Great Bend, KS 67530.

Quality 99 Software relocates office

Quality 99 Software has moved to larger offices, according to company president Larry Hughes.

New address for the company is 6ll 26th St. S., Arlington, VA 22202. New phone number is (703) 836-4629.

Hughes says users can receive a catalog of Quality 99's disk programs by sending

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the company a stamped, self-addressed business-sized (No. 10) envelope at the above address.

Harrison finds bugs

Harrison Software has uncovered and corrected two bugs in its Word Processor. Both affect the "Configure System" utility. The first will affect persons who use other than "PIO as the printer port, as only the first three characters of the printer port name will come back when the system reboots with a configure file.

The other bug is in the "Printing Defaults" section of the same utility. The type style input won't accept anything but a number.

Bruce Harrison says both bugs have been corrected in orders shipped this year. He notes that the bugs will not affect all users.

He says, "Any user who's bothered by these bugs can simply write to us and we'll forward a corrected disk at no cost."

Write Harrison Software, 5705 40th Place, Hyattsville, MD 20781.

Inverter available

PowerStar Products Inc. has released a small inverter for use in cars, trucks, RVs, vans and boats.

The **POW200** plugs into any standard cigarette lighter and delivers 115 volts AC (house current) for operating appliances up to 200 watts (400 watts peak), according to the manufacturer. It will run a personal computer, an electric drill or a TV and VCR.

The inverter works whether the engine is running or not, the manufacturer says, since it uses the energy stored in the vehicle battery. The manufacturer says it is expected to fill many applications previously filled by a generator.

Suggested retail price is \$149.95.

PowerStar Products is located at 10011 North Foothill Blvd., Cupertino, CA 95014. Phone is (408) 973-8562.

Reservation mixups plague Fest West

BJ Mathis of the Southwest Ninety-Niners, says that problems have been experienced with a number of room reservations for the TI Fest West '90, to be held at the Day's Inn at 88 East Broadway in Tucson, Arizona.

She says no reservation records exist for a number of attendees who say they have called to make reservations. She asks persons who have not received confirmations of their reservations or who are concerned about their reservations to telephone her at (602) 747-5046.

Send *Newsbytes* to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

User Notes

Reduce wear and tear on disk drives

This tip appeared in the newsletter of theOzark 99er User Group of Springfield, Missouri:

Since a disk drive can wear out eventually, and since most of the wear that can happen to a drive is in the area of the carriage and stepping, you can take steps to set up your diskettes to do a minimum amount of work everytime you use them. After a diskette has been filled up and you no longer expect to make any changes, and are about to put a write-protect tab on it, why not make a copy of it using the file-copy utility in your disk manager? This will serve two ends. First, you will benefit every time you catalog the diskette because it will run faster, and second, it will decrease the amount of head wear.

To see this for yourself, run a directory of a diskette that you have many files on, and just listen to the drive work. Then, copy the files to a newly initialized diskette and see how much faster it creates the directory.

...by the way

If you think that all you have to do to back up your programs is put them on a diskette and hide them from the kids, think again.

Magnetic media isn't particularly stable over the long haul. So that what is there today may be gone next year. Even if you do everything right.

This is of particular interest to hard disk users who back up their hard disks to floppies. (and at this point who doesn't?). It may also be of interest to those who keep archival copies of their programs and files.

At any rate, the data on magnetic media tends to deteriorate after a period. Some say data on a floppy will be safe for two years. Others say one year. Others say longer. It just depends. Even so, there are a few things you can do to keep your data as safe as it can be. Always keep your disks away from heat sources, computers, telephones, radios and other electronic devices. Also, don't expose them to ex-

tremes in temperature or humidity. And stack them on top of one another. This will help prevent them from warping.

After doing all this, understand that the data on the disks won't remain there forever. Bits and pieces of it will gradually just disappear, even if you keep them in a hermetically sealed bank vault.

So how can you maintain a set of backups? Well, you will have to backup your backups periodically, every year or two will probably be good enough. And, no, it doesn't matter whether you back them up to 5.25-inch disks or 3.50-inch disks. Even streamer tapes, being magnetic media, aren't guaranteed to keep your data forever.

Daytona user update

They still meet but not officially. Former members of the Daytona 99ers User Group, which disbanded some time ago, continue to meet at the Port Orange Public Library, according to Arnie Stewart. Six-eight 99/4A users meet at 7 p.m. Wednesdays at

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the library, where they keep a full TI system. The group folded because there weren't enough active members to keep it going. According to Stewart, the group still maintains a mailing address — P.O. Box 15232, Daytona Beach, FL 32115 — though it doesn't usually answer mail. Stewart says the informal meetings are open to any TI users.

For more information, contact Stewart at 904-428-0819, or write him at 827-11th Ave., New Smyrna Beach, FL 32169.

Right justified text

This comes from Bill Gaskill, of Grand Junction, Colorado. He writes:

Routines to manipulate text strings have appeared in MICROpendium numerous times over the years, including routines to center text on the screen, provide word wrap simulation and others. This routine demonstrates how a text string can be right justified. Most of the programming that is included is overhead that is used to let the user see what is occurring with the string while the program is working on it. The actual right-justify coding takes place in lines 140-190.

When the program loads you are prompted to enter a string of text to justify. Once you do so and press the Enter key the string is then divided into two strings at the point where the first blank space is found. Among other things, line 140 sets B\$ to equal a blank space and then T to equal the POSition of the first blank space in the string. Line 150 then sets S to equal the same position the first time around and then it uses that position to SEGment the original string into two strings. The display on your screen will show what C\$, the first half of the string, looks like, and then just below it, D\$, which is the second part of the original string.

Below both of the string segments E\$ is displayed just above the numeric ruler that is used to show you what occurs with the string that will ultimately become the right-justified text. The justification process takes place one action at a time so that you can observe it. Just press Enter each time you wish to see another part of the justification process take place.

When the string has been right-justified the program will jump to the end of the process in line 220 and then display the new string. You may press Enter again to do another string or simply end the program with FCTN Quit.

100 CALL CLEAR :: CALL SCREE

N(5):: FOR A=1 TO 14 :: CALL

COLOR(A, 16,5):: NEXT A !215

110 DISPLAY AT(1,5): "RIGHT J USTIFY TEXT" :: CALL CHAR(12 6,"ØØFF")!173 120 DISPLAY AT(3,1): "Enter s tring to justify:" :: DISPLA Y AT(6,1): !233 13Ø DISPLAY AT(18,1):RPT\$("; ",28):"123456789Ø123456789Ø1 2345678 ':: DISPLAY AT(21,1) :RPT\$("~",28)!238 14Ø ACCEPT AT(5,1)SIZE(-28): A\$:: B\$=" " :: I=LEN(A\$):: IF I=28 THEN 220 ELSE T=POS(A\$,B\$,1):: G=T :: DISPLAY AT (22,1):" " !Ø64 15Ø S=POS(A\$,B\$,T):: C\$=SEG\$ (A\$,1,S):: D\$=SEG\$(A\$,S+1,(2 8-S))!Ø92 160 DISPLAY AT(9,1):C\$:: DI SPLAY AT(11,1):D\$!Ø65 170 IF C\$="" THEN E\$=D\$:: T =G+1 :: GOTO 15Ø !172 18Ø E\$=C\$&B\$&D\$!2Ø4 19Ø DISPLAY AT(17,1):E\$:: A \$=E\$:: IF LEN(A\$)=28 THEN 2 20 ELSE T=S+G !236 200 DISPLAY AT(23,1):"Press any key to continue..."! \$99 210 CALL KEY(0.X.Y):: IF Y=0 THEN 210 ELSE 150 1015 220 DISPLAY AT(5,1):A\$:: DI SPLAY AT(22,1):"Text is now right-justified.":" ":" "!1 ØЗ 23Ø CALL KEY(Ø,Y,X):: IF X=Ø THEN 230 :: GOTO 120 !139

PLUS! mods told

This comes from Jack Sughrue, of East Douglas, Massachusetts. Sughrue is the author of PLUS!. He writes:

There is a debug item relating to PLUS! that I would like to correct. In the monthly planning calendar program the year

1990 will not print out on some earlier versions of PLUS!. The error occurs in the first DATA line (around 240 on most early versions) the @ signs in that line should be changed to the number 1. The error crept in when I was in the process of changing the printout to a different framing device for the days. PLUS! (version 2.0) has all the bugs removed and all the new changes operating smoothly.

The second PLUS! item which should be changed for anyone using the newer versions of Funnelweb are the coding items C1 and C2. Because FWB's CONFIG program now uses these terms, I recommend that all the C in PLUS! codes be changed to Z codes. To do this properly, rename (with DM-1000 or whatever disk manager you use) codes C0 through C9 to Z0 through Z9. Then go inside each 2-sector, numbered autocode and change the first line of each from .IF DSK1.Cn to .IF DSK1.Zn; the n in each case being the code number shown. These latter changes must be done in the EDIT mode and reSAVEd under their original numbers. This will then remove all the conflicts with people who retain their CONFIG files on their working word processing disk. You might also want to change the DSK number to your preference at the same time for the full autoload features.

c99 correction

This comes from MICROpendium columnist Charles E. Kirkwood Jr., of Clemson, South Carolina. Kirkwood writes a column the c99 column. He writes:

For some reason or other your word processor did not print the same character as mine in the December c99 article. This normally might not make much difference, but in this case the address labels won't be printed correctly for those who use the disk version.

To quote from the article as published: I order to print the name on one line and the address on as many lines as needed, two characters, and ', are used to indicate where a carriage control should be and the end of the address, respectively. Sample address data:

MR. JOHN DOE"100 Lark Ave."Clem (See Page 45)

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MISS JANE DOE"245 Main St."Easley, SC 29640'(803)8550000

A blank appears for the first character in the text and a quotation mark appears in the examples. I wanted to use characters that are not normally used. This first character should have been a tilde, that little wavy line (FCTN W), thus;

MR. JOHN DOE 100 Lark Ave. Clem son, SC 29631 (803) 6540000

MISS JANE DOE 245 Main St. Eas ley, SC 29631'(803)8550000

This incorrect character also appeared in the PRINT A LABEL function.

This will not be a problem for those who copy the article from the magazine, because the text and program use the same symbol, but it will be a problem for those who receive the disk.

The PATH command

This comes from Bob Sherburne, of Las Vegas, Nevada. He writes:

You may or may not be familiar with the PATH command in MDOS. It lets you define a path to search through if the command or filename you type is not found on the current drive. I have written over 100 batch files to take care of the mundane chores or loading modules from MDOS, printing or showing files, doing catalogs of directories, etc. Even though the batch files are only 2-4 sectors in length, they still took up 200+ sectors on my Horizon RAMdisks.

Using

"PATH H:BATS;H:MDOS;H:UTIL;"

will tell the computer to look through three directories on my hard drive and see if the command/filename is located in any of them. If it is, MDOS will then run the file just as if you had typed in the correct drive, directory and filename in the first place. This lets me use my Horizon RAMdisks as uncluttered workbenches but still have hundreds of files available *instantly* on command. It takes less than one second to access a batch file via the PATH using a 28ms hard drive.

PATH also works with floppies. "PATH A:;B:;C:;" searches floppy drives A, B and C for the

command/filename if it is not found on the current drive. I cannot recommend a long path when using floppy disk drives since it takes much longer to search each drive than it does to search a hard drive or RAM-disk. If you don't have a hard drive or RAMdisk, it might be a good idea to keep frequently used batch files or programs on one of your floppy drives and use a short path to search that particular drive.

The PATH command may be included in your AUTOEXEC or typed in from the command mode. If PATH is entered without parameters the current path will be displayed for you.

MDOS has what I consider to be a major flaw concerning this command: If you have used CD (change directory) and are no longer in the Root directory, the PATH command no longer works..

Complete cleaning cures console lockup

This comes from Bruce Willard, of Worcester, Massachusetts. Willard is vice president of the Massachusetts Users of the Ninety-nine and Computer Hobbyists. Because the following involves disassembly of the 99/4A console, neither the author nor MICROpendium can take responsibility for the results. Follow the instructions carefully. Do not attempt it if you don't feel qualified. He writes:

Much has been written regarding lockups of the 99/4A console. These console seizures can be caused by dirt at various locations in the console, dirty edge contacts on cartridges, faulty power supplies, worn parts, and many other not so likely possibilities.

Over many years, I have found that, by far, the most likely culprits are dirt, grime, and grease in the cartridge port. Generally, the first signs of of problems are periodic lockups when using the Extended BASIC cartridge. Some people have actually thrown away their XBASIC cartridges, assuming them to be defective. What a waste! The problem progresses to where the XBASIC cartridge won't function at all. However, some of the game cartridges operate fine. I believe that is because more edge contacts are used in the XBASIC cartridge than in most other

cartridges.

What is required is only a thorough cleaning. I have cleaned a number of consoles over the years, providing console cleaning demonstrations at TI fairs and user group meetings. All of them had similar symptoms. Every one operated perfectly immediately after the cleaning. I can only conclude through my experience that dirt is the No. 1 TI99/4A killer.

Recently, I began having lockup problems on my console which cleaning didn't resolve. Closer inspection showed that the cartridge port adapter edge contacts had "pits" in them where they made contact with the internal metal pieces of the socket mounted on the main printed circuit board. Pits are a great place for grime to settle, and escape basic surface cleaning. I carefully resoldered the edge contacts using a low wattage soldering iron. I do not recommend doing this if you are not at least somewhat experienced using a soldering iron. This solved the problem thus far.

The following may be helpful to those daring enough to clear up most lockups.

CONSOLE CLEANING AID

First, get some *bonded* paper for cleaning. Cut it into 4-inch strips about ¼-inch wide. Get a small, flat-bladed screwdriver to aid in cleaning. Also, acquire a phillips screwdriver to open the console.

To begin, disconnect all cables from the console. The on/off switch (for the black and silver consoles) comes off by pulling, very carefully, straight toward you (assuming the console is sitting flat in front of you the way you normally use it.)

Once the switch cap is removed, turn the console over and remove all screws. Life off the bottom. You will now see the main board encased in sheet metal, the power supply, and the keyboard. To get to the main board you must remove two screws from the power supply board and set the board aside. Now, there are three screws to remove the main board. Just be careful. You will be able to see all of them — one on each end and one in the middle. When the screws are removed you will be able to life the main board out once you pull off the keyboard connector, which is about in the middle of the edge of the board that is closest to the center of the case.

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Now that you have disconnected the main board, turn it over. Notice the L-shaped cartridge (GROM) adapter. Just pull it off. At this point we will begin cleaning. Take the flat-bladed screwdriver and fold a strip of the bonded paper over the end. Now place that covered end into the GROM connector and move it back and forth and up and down. Do it carefully, applying some pressure to the sides of the connector. Continue this action, changing the bonded paper frequently as it becomes dirty, until you can pass the paper anywhere in the connector and have it come out clean. You don't need solvents. Using the wrong type could cause you more problems.

Perform the same procedure on the L-shaped adapter, but first carefully remove the plastic cover. It is held on with little tab clips. It might even be wise at this time to remove, permanently, the cloth strip inside. It's probably too filthy to do any good anyway.

Once that is done, rub the bonded paper on the edge contacts of the adapter (both sides) until they are clean. Do the same thing to the edge contacts on the main printed circuit board.

Now carefully reassemble the console. Insert the adapter into the main PC board first. Align the main PC board so that the GROM port will slide through the small opening in the plastic case. Then pay close attention to the little plastic alignment posts that will help position the main board properly for reattachment with screws.

Continue with the re-assembly of the console. Once assembled, be sure everything fits properly and then give it an operational test. It's amazing what a clean console can do for you.

Printer buffer is a good deal

This comes from G.S. Tory of Victoria, British, Columbia. It concerns the Heathkit SK-203 printer buffer, which is available for a low price. He writes:

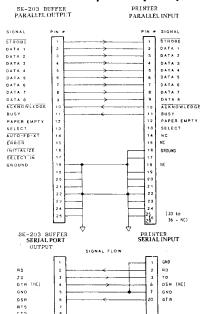
The buffer recently went on sale at a clearance price and is certainly a versatile unit. It comes with 64K of memory and is expandable to 512K. It has both serial and parallel inputs and outputs, and may be

operated straight through, crossed or both inputs to one output.

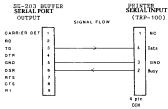
The serial baud rate, number of data bits and number of stop bits selected for the output can be different than the input parameters. For example, I was running 4800 (7 data bits, odd parity, 1 stop bitt into the unit and feeding out 600 (8N1) to a printer. It allows printing extra copies using front panel buttons, or clearing the buffer, etc. It also has a digital display showing the amount of memory currently available, and it tests the memory at each powerup.

Connecting cables follow IBM conventions, which may seem odd to TI users. DB25 connectors are used for the parallel connectors and DB9 for the serial! Of course, there are no hookup diagrams shown in the handbook for the TI, but I've included a copy of the diagram I used to make up cables for my system (see below). My cables are shielded, although I haven't shown them to be. You can make them shielded or unshielded. Other models of printers may require minor changes, but you can consult your printer handbook for this.

Heathkit SK-203 Buffer to Printer (Parallel) Cables (For SC Messenger (par. or ser.) & Radio Shack TRP-100 parallel input only)



Heathkit SK-203 Buffer to Printer (Serial) Cables (Using Radio Shack TRP-100 Printer)



If you can pick up one of these buffers at a good price, I'd say — Go for it! The kit requires lots of careful soldering, but all IC's are socketed, which makes it a little easier, both for the building and for any required fault-finding.

Geneve PD software

MICROpendium will supply public domain Geneve software to readers who can't get it from bulletin boards or user groups. The disks are numbered by set. Currently there are three sets available, numbered 1-3. Each set contains a variety of programs and files for the Geneve. Because of the variety of disk formats used by readers, the sets are being offered in three formats. The chart below gives the cost per set based on the disk format ordered:

FORMAT	COST	# of DISKS
DSDD	\$5	1
DSSD	\$6	2
SSSD	\$8	4

When ordering, stipulate the format required and the disk controller you are using.

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