Getting music onto a program
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Help for your spring garden
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MICROpendium

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*READ THIS

Here are some tips to help you when entering programs from MICROpendium:
1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation 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.

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 LANDED

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

- **Near 100% Compatible:**
  - If you have a program written in Basic, Extended Basic, XBII, Assembly Language, Forth or as you name it, if it runs on the 99/4A then it is near certain to run on the GENEVE.
- **32K No Wait State High Speed RAM:**
  - Programs like MultiPlan, which are painfully slow on the 99/4A, run many times faster, thanks in part to the High Speed RAM.
- **V9938 Video Processor with 7 Graphics Modes:**
  - Compatible with the 99/4A so you can use the GENEVE with the TV or monitor you are currently using. Same resolution as the Mac but with color. Faster than the Amiga, as fast as the Atari and does it with the aspect ratio, something the Amiga and IBM AT can not do. Aspect ratio renders higher resolution, better color, and appearance through the use of square pixels. In the high resolution mode, 256 colors may be displayed on the screen at one time by the GENEVE, eight times as many as the Amiga can display in its high resolution mode.
- **Mouse Interface:**
  - The mouse interface is built in and ready to use with the MYARC mouse. But, we don't stop there, it is also ready to support the newest hardware, like video digitzers, and that's just for starters.
- **6 Complete Pieces Of Software Are Included WithThe GENEVE. But, three you will not be able to see how you ever did without are:**
  - My-Word Processor; 80 columns, help screens for all modes of operation including control-U, initialize a disk without leaving the program, print formatted text to the screen for viewing before sending it to the printer and that's still not all My-Word will do.
  - Advanced Basic; the best and most powerful basic on the market today.
  - Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.
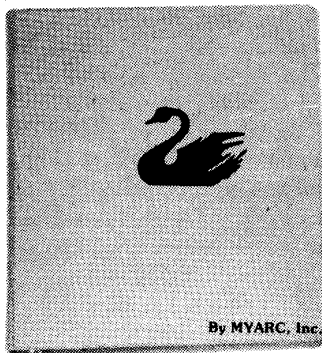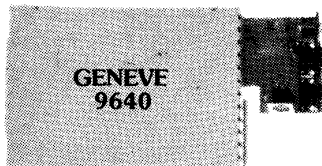
MONITOR OPTIONAL

MOUSE OPTIONAL

ENHANCED KEYBOARD OPTIONAL

GENEVE 9640

By MYARC, Inc.

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

GENEVE
P. O. Box 140
Basking Ridge, New Jersey 07920-1014
(205) 854-5843
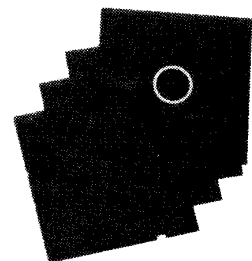
Feedbach

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

Feedback

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.

5½ 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 MICROpendium. 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

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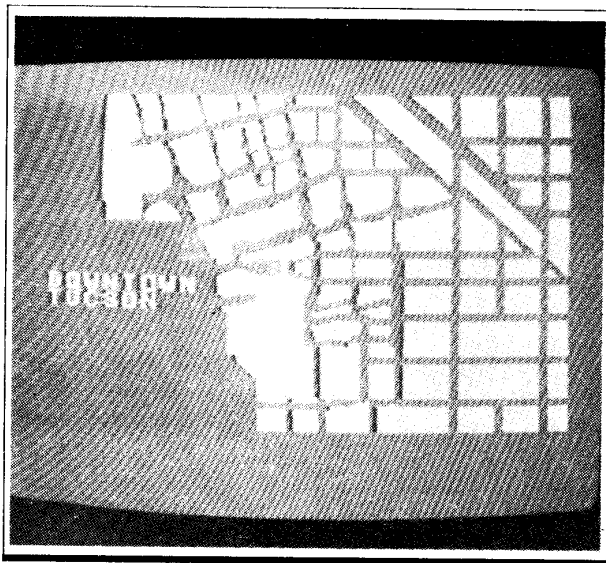
in (by abbreviating "Avenue" and "Street," using DATA statements to define characters, combining PRINT statements, and leaving out all REMark statements).

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 "lowercase"

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)   (ENTER)
NEW   (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
150 CALL CHAR(C,C$)!081
160 NEXT S !233
170 DATA 33,000E7E7E7E7E0E,3
5,7F3F1F0F0783C1E,36,4303000
0000001,37,F0F8FCFEFFFCE,38,
0301000000080C0E !245
180 DATA 40,00000000C3C3C3C3
,41,000000E0FFFFFFFF,43,0000
00000F0F0F0F,47,0303030303030
0303,61,83C1E0F,63,3F3F3F3F
!117
190 DATA 58,83C1C0C0C0C0C2C3
,59,0080C0E0F0F0F0F,64,C3C3C
3C3,91,0381C0E0F0F8FCFF,93,0
000000003030303,94,F0F0F0F !
189
200 PRINT : :"TAKE A WALK IN
DOWNTOWN":"TUCSON, ARIZONA.
": :"USE THE RIGHT ARROW KEY
":"TO GO TO THE NEXT POINT"
!071
210 PRINT "OF INTEREST.": :"
USE THE LEFT ARROW KEY":"TO
BACK UP.": :"PRESS <ENTER> T
O READ ABOUT THE SITE.": : :
 :!047
220 FOR C=96 TO 159 !225
230 READ C$ !254
240 CALL CHAR(C,C$)!081
```

```
250 NEXT C !217
260 DATA FFFFFFFFFFFFFFFF,F0
F0F0F0F0F0F0F0F,FFFF00000000FF
FF,0F0F0F0F0F0F0F0F,00000000
FFFFFFFF,FFFFFFFF !057
270 DATA 7F3F1F0F0703 01,0080
C0E0F0F8FCFE,00000000F0F0F0F
,F0F000000000F0F,C3C3C3C3C3C
3C3C3,C3C300000000C3C3 !060
280 DATA 3F3F3F3F3F3F3F3F,0F
0F0F0F,8F8FC7C7E3E3F1F1,F1F1
F9F8F8FCFCFC,FEFFFFFFFFFFEF0C
,008080C08 !094
290 DATA FCFCFCFCFCFEFEFEFE,FF
7F7F3F3F3F3F3F,7F7F7F3E3,FEF
8C0000001073F,C00000000E3E3F
1F,0000073F3F1F1F1F !219
300 DATA 07C7C3C3E3E1E1E1,FC
FEFEFCF0C0C0C0E,FE7000000000E
7F,00000000071F1F0F,00011FFF
FFFFFFFF,1F1F1F0F0F0F0707 !2
01
310 DATA 1F1F8F8F8FCFC78,E0E
0E0F0F0F,3F3F3F3F,00203038,0
00000000080C0E,0F0F00000000
01,0080C3C3E3E3E1C18 !135
320 DATA 0063E3E1F1F0C,1CFCF
CF880000E7F,FFFFFF7F3F1F0F07
,7E38000000033F3F,0000001CFC
FCFEFE,00001C3C3C3C3 !144
330 DATA 0707038380808,00000
00043C3E3E3,000000000F0F0F0F
,E0C08,0CFCFCF8C,00010303838
18181,E3E3E3E1E1E1E1E !248
340 DATA 01070F1F1F3F3F3F3F,C0
F0F8FCFEFEFFFF,07070707703030
```

```
101,070000000000073F,0000000
00F7FFFFF,808080C0C0C0E0E !2
47
350 DATA FFFFFCE,E0800000000
00C7C,FFFCF8F8F8F8F8FC,1F1F1
F18000010F,FFF00000000FFFFF
,3F3C00000000F0FF !227
360 DATA 1818181818181818,00
F0FEFEFEFCFCF8,13,23,13,21,1
5,19,12,18,14,17,13,16,11,16
,10,16,8,14,8,15 !151
370 FOR C=0 TO 34 !104
380 READ X(C),Y(C)!091
390 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
410 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
430 CALL KEY(0,K,S)!187
440 IF K<>13 THEN 430 !164
450 CALL CLEAR !209
460 CALL CHAR(60,"F0F0F07030
1")!006
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
520 C=0 !250
```

REGENA ON BASIC—

```
530 CALL CLEAR !209
540 PRINT "    `no`o`oopqee"
;CHR$(130);"f`gf`c`j`a`" !00
5
550 PRINT "     `orsptuvwx`lc
gf`gfc`j`a`" !232
560 PRINT "    `yz{|x`}~";CH
R$(127);"e";CHR$(128);"me";C
HR$(129);"f`g";CHR$(131);"bk
bib" !208
570 L$=CHR$(132)&CHR$(133)&C
HR$(134)!141
580 PRINT "     ```x`o`";L$;"
}`c`lgf`";CHR$(130);"fj`a`"
!092
590 L$=CHR$(135)&CHR$(112)&C
HR$(136)&CHR$(137)&CHR$(138)
&"`"&CHR$(139)&CHR$(117)&CHR
$(140)!079
600 PRINT "    ```a";L$;"dd"
;CHR$(141);"d#cg$bib" !082
610 L$=CHR$(142)&CHR$(123)&C
HR$(137)&CHR$(125)&"p"&CHR$(
143)&"u"&CHR$(144)&"`"&CHR$(
145)!208
620 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 "    l`";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);"|``p";L$;
"s`l``c`:";CHR$(135);"`;`" !1
13
670 L$=CHR$(154)&CHR$(149)&C
HR$(150)!150
680 PRINT TAB(10);"}";L$;"|p
m";CHR$(152);"?emeeme>=<`" !
200
690 L$=CHR$(157)&" "&CHR$(15
8)!221
700 PRINT TAB(11);"u";L$;"!c
`l`/``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$(
136);CHR$(150);"``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
760 PRINT TAB(11);"m````c`ae
@eemeee^e" !157
770 PRINT TAB(12);"f```c`a`j
``c```a`" !054
780 PRINT TAB(13);"````c`a`j`
`c```a`" !208
790 PRINT TAB(13);"bibkd|+)d
d+d(dhd" !057
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
850 IF S<1 THEN 820 !064
860 IF (K=68)+(K=100)+(K=9)<
>-1 THEN 910 !067
870 C=C+1 !255
880 IF C<35 THEN 810 !094
890 C=0 !250
900 GOTO 810 !124
910 IF (K=83)+(K=115)+(K=8)<
>-1 THEN 960 !119
920 C=C-1 !000
930 IF C>=0 THEN 810 !228
940 C=34 !050
950 GOTO 810 !124
960 IF K<>13 THEN 820 !044
970 CALL CLEAR !209
980 IF C>17 THEN 1010 !039
990 ON C+1 GOSUB 1070,1100,1
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"
!000
1080 PRINT : :"FORMERLY SANT
A RITA HOTEL,  BUILT IN 1904
." !169
1090 RETURN !136
1100 PRINT "METROPOLITAN TUC
SON":"CONVENTION AND VISITOR
S    BUREAU": :"130 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
1150 RETURN !136
1160 PRINT "CHARLES O. BROWN
HOUSE":"AND OLD ADOBE PATIO
": :"40 W. BROADWAY BLVD.":
: :"THE OLD ADOBE PATIO IS"
!202
1170 PRINT "PART OF THE BROW
N HOUSE.": :"THE FIRST BROWN
HOME WAS THEMEXICAN TERRITO
RIAL-STYLE" !002
1180 PRINT "STRUCTURE AT THE
SOUTH END  OF THE PATIO FAC
ING JACKSON STREET." !092
1190 RETURN !136
1200 PRINT "SAMANIEGO HOUSE"
: :"222 S. CHURCH AVE." !043
1210 PRINT : :"NOW A RESTAUR
ANT, THIS      TYPICAL TOWNH
OUSE OF THE    1880S 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.
```

REGENA ON BASIC—

AND 3 P.M. ON FRIDAYS, IT
BECOMES THE SITE OF AN OPEN
-AIR FARMERS MARKET." !244
1270 RETURN !136
1280 PRINT "GARCES FOOTBRIDG
E" !046
1290 PRINT : :"THIS BRIDGE O
VER CONGRESS   STREET BETWEE
N CHURCH AND   GRANADA AVENU
ES IS A" !209
1300 PRINT "MEMORIAL TO FRAN
CISCO   GARCES, AN EXPLO
RER AND THE FIRST FRANCISCAN
 MISSIONARY" !074
1310 PRINT "TO THE PIMA INDI
AN VILLAGE   AT THE FOOT OF S
ENTINEL   PEAK." !214
1320 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
OCK FACES   A PICTURESQUE ME
DIAN OF   INDIGENOUS VEGET
ATION." !184
1360 RETURN !136
1370 PRINT "TUCSON CITY HALL
": :"255 W. ALAMEDA ST." !10
3
1380 PRINT : :"THE BASE FOR
CITY":"ACTIVITIES, THIS 10-S
TORY   TAN STRUCTURE FACES":
"EL PRESIDIO PARK." !156
1390 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
RONTIER   PRESIDIO. THIS
PARK IS THE SOUTHERN HALF OF
 THAT" !105
1430 PRINT "PRESIDIO, THE PL
AZA DE LAS   ARMAS." !052
1440 RETURN !136
1450 PRINT "PIMA COUNTY COUR
THOUSE": :"155 N. CHURCH AVE
." !084

1460 PRINT : :"THIS BUILDING
 COMBINES":"SPANISH AND SOUT
HWESTERN   ARCHITECTURE IN
ITS COLUMNS," !200
1470 PRINT "ARCHES, DECORATE
D FACADE,   TILED DOME, INTE
RIOR COURT, AND FOUNTAIN." !
098
1480 RETURN !136
1490 PRINT "GOVERNOR'S CORNE
R": :"177 N. CHURCH AVE." !2
06
1500 PRINT : :"THIS WAS THE
LOCATION OF THEEXPANSIVE, ON
E-STORY ADOBE HOME OF LOUIS
C. HUGHES," !037
1510 PRINT "GOVERNOR OF THE
TERRITORY   FROM 1893 TO 189
6." !031
1520 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
RIGINAL   ADOBE BUILT BETW
EEN 1862   AND 1875." !088
1560 RETURN !136
1570 PRINT "SOUTHWEST PARKS
AND":"MONUMENTS ASSOCIATION"
:"OFFICES AND BOOKSTORE": :"
221 N. COURT AVE." !057
1580 PRINT : :"PROCEEDS FROM
 BOOKS SOLD   HERE ON ALL F
ACETS OF":"SOUTHWESTERN CULT
URE AND" !002
1590 PRINT "NATURAL HISTORY
HELP FUND   THE NATIONAL PAR
K SERVICE'S EDUCATIONAL AND
RESEARCH" !011
1600 PRINT "PROGRAMS.": :"TH
E HOUSE WAS ONCE THE":"STORK
'S NEST MATERNITY WARD." !12
2
1610 RETURN !136
1620 PRINT "EL CHARRO": :"31
1 N. COURT AVE." !038
1630 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.": :"407 N. MEYER A
VE." !127
1680 PRINT : :"BUILT IN THE
1880S, THIS   ADOBE BUILDIN
G IS PART OF   THE BARRIO PR
ESIDIO HISTORIC" !086
1690 PRINT "DISTRICT AND WAS
 PLACED IN   THE NATIONAL REG
ISTER OF" !076
1700 PRINT "HISTORIC PLACES
IN 1975." !147
1710 RETURN !136
1720 PRINT "THE OWL'S CLUB M
ANSION": :"378 N. MAIN AVE."
 !079
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
1750 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" !061
1780 PRINT "ARCHITECT HENRY
TROST AT THETURN-OF-THE-CENT
URY." !224
1790 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." !025
1830 RETURN !136
1840 PRINT "ROMERO HOUSE": :
"ON MEYER, NORTHEAST OF THE

REGENA ON BASIC—

```
MUSEUM OF ART" !018
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." !250
1870 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" !046
1900 PRINT "REGISTER OF HIST
ORIC PLACES." !036
1910 RETURN !136
1920 PRINT "TUCSON MUSEUM OF
 ART": :"140 N. MAIN AVE.":
: :"BUILT IN 1975, ITS EXHIB
ITS" !214
1930 PRINT "INCLUDE CONTEMPO
RARY WORKS.": :"PERMANENT CO
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" !052
1980 PRINT "POLITICAL REPRES
ENTATIVE     EDWARD NYE FISH
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" !0
05
2020 PRINT : :"TERRITORIAL I
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." !017
2040 RETURN !136
2050 PRINT "FEDERAL BUILDING
": :"301 W. CONGRESS ST.": :
 :"THIS EIGHT-STORY EXAMPLE
OF" !067
2060 PRINT "MODERN TERRITORI
AL DESIGN     STANDS ON HUGE C
YLINDRICAL    CONCRETE PILLARS
." !053
2070 RETURN !136
2080 PRINT "ARIZONA STATE OF
FICE BUIDING": :"401 W. CONG
RESS ST.": : :"THE FRONT OF
THIS RAMBLING," !073
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" !0
86
2140 PRINT "HERITAGE FOUNDAT
ION, IT IS  OWNED BY THE ARI
ZONA":"HISTORICAL SOCIETY."
!052
2150 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," !037
2180 PRINT "A LITTLE THEATRE
, LANDSCAPEDGARDENS, PUBLIC
PAVILIONS,   AND PARKING AREA
S." !045
2190 PRINT : :"1989 ADDITION
S INCLUDE AN   EXHIBIT HALL,
 A GRAND":"BALLROOM, AND A G
ALLERIA." !046
2200 RETURN !136
2210 PRINT "CUSHING STREET B
```

```
AR AND":"RESTAURANT": :"343
S. MEYER AVE." !065
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."
!030
2250 RETURN !136
2260 PRINT "TUCSON PUBLIC LI
BRARY":"MAIN BRANCH": : :"20
0 S. SIXTH AVE." !230
2270 RETURN !136
2280 PRINT "U.S. POST OFFICE
" !169
2290 PRINT : :"141 S. SIXTH
AVE." !239
2300 RETURN !136
2310 PRINT "TRAILWAYS BUS DE
POT": :"201 E. BROADWAY BLVD
." !055
2320 PRINT : : :"GREYHOUND B
US DEPOT": :"2 S. FOURTH AVE
." !038
2330 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
ND HIS   GANG." !087
2360 RETURN !136
2370 PRINT "SOUTHERN PACIFIC
 RAILROAD    STATION--AMTRAK"
: : :"400 E. TOOLE AVE." !01
0
2380 RETURN !136
2390 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" !037
2410 RETURN !136
2420 END !139
```

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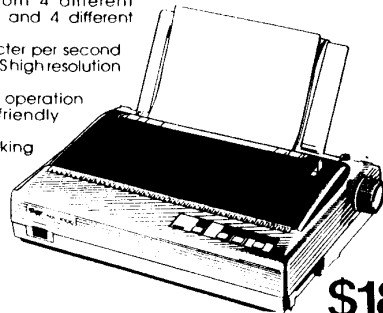
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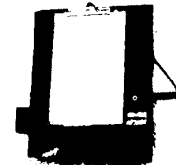
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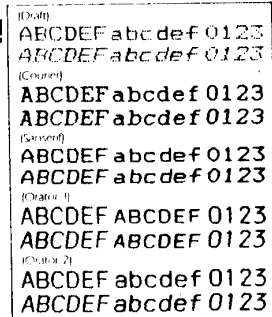
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EXTENDED BASIC

Transferring files between the 4A and PCs without a modem

By JERRY STERN
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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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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.
2. 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 "¦¦" 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.

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 = thecolumn number (starting with zero), and t = the segment length. This can be added to your STRING function library along with strcpy(sl,s2) (copy s2 into sl) and stncpy(sl,s2,n) (copy at most n characters of s2 into sl).

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

```
/*COPY A SEGMENT OF A STRING -- USING ARRAYS*/
seg(y,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*/
```

```
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=0;
}
```

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       1906    G S      1.00 1918S  G S     1.00
1897   G S     1.25
NICKLE BUFFALO     1918    AG S      .25 1919  AG S      .25
1923  AG S     .25
NICKLE BUFFALO     1927S   G S     2.00 1929  AG S      .30
1929  AG S     .25
```

In this example program, only the first keyword can apply to

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```
100 ! TEXT_PC   JLS 2/90 V 1.
0 FORMATS TEXT FILES FOR RS2
32 PORT !014
110 CALL CLEAR :: CALL BLUE
:: CALL TITLE !082
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$
!083
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 130 !054
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$ !070
180 IF ASC(SEG$(A$,LEN(A$),1
))<32 THEN A$=SEG$(A$,1,LEN(
A$)-1)&"¦¦" !037
190 IF ASC(A$)=128 THEN IF L
EN(A$)=22 THEN 220 !114
200 PRINT #9:A$&" " !085
210 GOTO 170 !249
220 CLOSE #1 :: CLOSE #9 !18

4
29505 SUB BLUE !149
29510 ! SWITCHES DISPLAY TO
WHITE ON BLUE; JLS 7/88 !230
29515 CALL SCREEN(5):: FOR L
=0 TO 14 :: CALL COLOR(L,16,
1):: NEXT L :: SUBEND !202
32590 SUB TITLE !240
32600 DISPLAY AT(2,10):"TEXT
-PC" :: CALL CHAR(96,"00FF")
:: CALL HCHAR(3,12,96,7)!179
32605 DISPLAY AT(5,1):"
LISTS TEXT FILES
TO DIRECT PC PORT    " !248
32635 SUBEND !168
```

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the first field. In other words, the first keyword might be PENNY or PEN or INDIAN or IND or NICKLE or NIC or BUFFALO 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, PENNY 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.STDIO
#include DSK1.FLOAT1
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][20]; /*keywords*/
  int keylen[6]; /*length of keywords*/
  char kk[20];    /*one keyword for argument*/
  char s[10];
  float amt[8],tot[8];
  puts("     INVENTORY SEARCH PROGRAM\n");
  puts("     Charles E. Kirkwood, Jr.\n");
  puts("     Box 1241, Clemson, SC 29633\n\n");
  puts("Input disk and file name ");
  fn=gets(fnc);
```

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```
col=81;
puts("Input number of key words ");
n=atoi(gets(ic));
while(n>0)
{
  in=fopen(fn,"r");
  puts("Input number of matches required ");
  nr=atoi(gets(ic));
  puts("Do you want a print out? (Y/N) ");
  yn=getchar();
  if(yn=='Y')
    pt=fopen("PIO","w");
  b='a';
  puts("\nInput key word(s), terminate each with  <ENTER>");
  putchar(10);
  for(i=1;i<=n;++i) /*input keywords*/
  {
    gets(buff);
    strcpy(&key[i][0],buff);
    keylen[i]=strlen(&key[i][0]);
  }
  putchar(10);
  u=0;
  itof(0,tot);
  k2=20;
  cl=20;
  while(b)
  {
    p=0;
    b=fgets(buff,col,in); /*input record*/
    k1=0;
    seg(c,b,k1,k2);
    keyln=keylen[1];
    strcpy(kk,&key[1][0]);
    p=fndstr(c,cl,keyln,kk);
    k1=k1+20;
    while(buff[k1])
    {
      r=p;
      seg(d,b,k1,k2);
      for(m=1;m<=n;++m)
      {
        keyln=keylen[m];
        strcpy(kk,&key[m][0]);
        k=fndstr(d,cl,keyln,kk);
        r=k+r;
        if(r>=nr)
        {
          if(yn=='Y')
          {
            fputs(c,pt);
            fputs(d,pt);
            putc(10,pt);
            value(d,amt);
          }
```

```
          else
          {
            u=u+1;
            puts(c);
            puts(d);
            value(d,amt);
            if(u==20)
            {
              puts("press <ENTER> ");
              t=getchar();
              putchar(10);
              u=0;
            }
          }
          r=p;
          fexp(tot,"+",amt,tot);
        }
      }
      k1=k1+20;
    }
  }
  puts("TOTAL VALUE = $");
  fpput(tot,s);
  fclose(in);
  if(yn=='Y')
  {
    fputs("TOTAL VALUE = ",pt);
    fputs(ftos(tot,s,0,0,2),pt);
    fclose(pt);
  }
  puts("\nType 0 to stop.");
  puts("\nInput number of key words ");
  n=atoi(gets(ic));
}
}

/*SEARCH FUNCTION*/
fndstr(b,blen,keyln,kk)
int blen,keyln;
char *b,*kk;
{
  int i,j,p,s,k;
  p=blen-keyln;
  j=0;
  while(j<=p)
  {
    if(*kk==*(b+j));
    {
      s=0;
      while((s<keyln)&(*(kk+s)==*(b+j+s)))
        ++s;
      if(s==keyln)
      {
        k=1;
        return(k);
```

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```
            }
          }
        ++j;
      }
    k=I;
    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=I;
    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);
```

```
    while(*e==' ')
      ++e;
    stof(e,a);
    return(a);
}
```

Some amount of compilation and assembly time can be saved 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

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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 EPROM

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 double-density formats. Incidentally, although manufacturers label their diskettes as being suitable for double-sided, double-density 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 double-sided 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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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

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 full- or 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 actually 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. Established 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.

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.

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 !026
20 REM Original by Ted Batut
is 1982(c) for PC !229
30 REM Converted for TI99/4A
by J. Koloen (5/89) !255
40 REM Runs in Extended BASI
C !044
50 REM!154
60 REM!154
70 REM Initialization !130
80 REM The variables are CRO
P, OUNCES, SPACING, YIELD, U
NITS, FERTILIZER RATE !004
90 REM for MANURE (1) and 10
-15-10 (2) !035
100 DIM C$(23),O(23),S$(23),
Y(23),U$(23),F1(23),F2(23)!2
38
110 GOSUB 1520 !069
120 CALL CLEAR !209
130 PRINT "****************
********" !150
140 PRINT " GARDEN PLANNING
PROGRAM" !251
150 PRINT "****************
********" !150
160 FOR I=1 TO 500 :: NEXT I
!255
170 PRINT "DO YOU WANT DIREC
TIONS?" !215
180 INPUT A$ !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 FOLL
OWING CROPS" !025
230 PRINT "IS AVAILABLE:" !2
31
240 PRINT " 1 Snap Beans 13
Onions" !160
250 PRINT " 2 Pole Beans 14
Peas" !177
260 PRINT " 3 Lima Beans 15
Peppers" !255
270 PRINT " 4 Beets      16
Potatoes" !121
280 PRINT " 5 Broccoli    17
Pumpkins" !093
290 PRINT " 6 Cabbage     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     22
Tomatoes" !095
340 PRINT "11 Lettuce      23
Watermelon" !249
350 PRINT "12 Muskmelons 24
>>EXIT PGM." !190
360 PRINT "WHICH NUMBER DO Y
OU WANT";!181
370 INPUT A :: A=INT(A):: IF
A=24 THEN PRINT " GOOD GARD
ENING!" :: PRINT :: END !109
```

```
380 IF A<1 OR A>24 THEN PRIN
T "INVALID CHOICE" :: GOTO 2
60 !050
390 CALL CLEAR :: PRINT :: P
RINT !013
400 PRINT " YOU HAVE SELECTE
D ":C$(A)!042
410 PRINT " HOW MANY FEET OF
ROW        MIGHT YOU PLANT"
;!236
420 REM!154
430 INPUT F !216
440 CALL CLEAR !209
450 PRINT "HERE IS THE INFOR
MATION FOR" !204
460 PRINT F;" FEET OF ";C$(A
)!072
470 F=F/10 !057
480 PRINT "APPROXIMATE YIELD
IS" !020
490 Y2=INT(Y(A)*F+.5):: PRIN
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
640 !066
530 O2=O(A)*F !069
540 IF O2<.015625 THEN O2$="
LESS THAN 1/64" :: GOTO 630
```

GARDEN PLANNER—

(Continued from Page 28)
!145

```
550 IF O2>=.015625 AND O2<.0
3125 THEN O2$="BETWEEN 1/64
AND 1/32" :: GOTO 630 !169
560 IF O2>=.03125 AND O2<.06
25 THEN O2$="BETWEEN 1/32 AN
D 1/16" :: GOTO 630 !062570
IF O2>=.0625 AND O2<.125 THE
N O2$="BETWEEN 1/16 AND 1/8"
 :: GOTO 630 !171
580 IF O2>=.125 AND O2<.25 T
HEN O2$="BETWEEN 1/8 AND 1/4
" :: GOTO 630 !015
590 IF O2>=.25 AND O2<.5 THE
N O2$="BETWEEN 1/4 AND 1/2"
:: GOTO 630 !164
600 IF O2>=.5 AND O2<1.01 TH
EN O2$="BETWEEN 1/2 AND 1" :
: GOTO 630 !107
610 O2=INT(O2+.5):: PRINT "Y
OU WILL NEED ABOUT ";O2;" OU
NCES" !211
620 IF A=13 THEN PRINT "OF O
NION SETS." :: PRINT :: GOTO
 640 ELSE PRINT "OF SEED." :
: PRINT :: GOTO 640 !105
630 PRINT "YOU WILL NEED ";O
2$ :: PRINT "OUNCES OF ";::
IF A=13 THEN PRINT " ONION S
ETS." ELSE PRINT "SEED." !12
2
640 PRINT "**** FERTILIZER R
ATES ****" !172
650 PRINT "MANURE (APPROX):"
;!116
660 F3=INT(F1(A)*F+.5):: PRI
NT F3;:: PRINT "LBS." !210
670 PRINT "CHEM. (10-10-10):
";!155
680 F4=INT((F2(A)*F)*10+.5):
: F4=F4/10 :: PRINT F4;:: PR
INT "CUPS." !174
690 PRINT "HIT ENTER--->";::
 INPUT A$ :: GOTO 210 !136
700 END !139
710 REM instructions !239
720 CALL CLEAR !209
730 PRINT " * * * * * * * *
* * * * " !020
740 PRINT "This program is d
esigned to help you in plann
ing and" !176
750 PRINT "planting your gar
den. You  will be shown a l
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" !026
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" !019
810 PRINT "use." !226
820 PRINT "Fertilizer rates
will" !175
830 REM!154
840 REM!154
850 REM!154
860 REM!154
870 PRINT "HIT ENTER--->";!1
08
880 INPUT A$ !247
890 CALL CLEAR !209
900 PRINT "be given in terms
 of pounds of manure per row
 and cups" !051
910 PRINT "of 10-10-10 (a co
mmon gardenchemical fertiliz
er mix-" !029
920 PRINT "ture). One word o
f 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" !041
960 PRINT "soils in between.
The rates given will be for
the aver-" !046
970 PRINT "age type of soil.
You shouldjudge on your own
how much" !088
980 PRINT "more" !026
990 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
ld use in  your own garden.
Also, the" !127
1080 PRINT "fertilzer value
of manure  varies widely de
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)

GARDEN PLANNER—

```
these re-    gards." !Ø34
111Ø PRINT !156
112Ø REM!154
113Ø REM!154
114Ø REM!154
115Ø REM!154
116Ø REM!154
117Ø PRINT "HIT ENTER--->";!
1Ø8
118Ø INPUT A$ !247
119Ø RETURN !136
12ØØ REM data section !1Ø5
121Ø REM If you would like t
o customize this program !23
6
122Ø REM by adding your favo
rite crops or changing the !
147
123Ø REM fertilizer rates, e
tc., this is where you do it
. !197
124Ø REM The first set of da
ta is the crop names. Note t
hat they !Ø5Ø
125Ø REM are in the same ord
er as the crop menu. If you
add more !224
126Ø REM crops, you'll have
to re-DIMension the appropri
ate variables, !ØØ7
127Ø REM change the menu sec
tion and initialization sect
ion. !ØØ9
128Ø DATA SNAP BEANS,POLE BE
ANS,LIMA BEANS,BEETS,BROCCOL
I,CABBAGE,CARROTS !Ø73
129Ø DATA CORN,CUCUMBERS,EGG
PLANT,LETTUCE,MUSKMELONS,ONI
ONS,PEAS,PEPPERS !Ø94
13ØØ DATA POTATOES,PUMPKINS,
RADISHES,SPINACH,SUMMER SQUA
```

```
SH,WINTER SQUASH !214
131Ø DATA TOMATOES,WATERMELO
NS !166
132Ø REM Next comes the data
for wt. of seed required pe
r 1Ø feet of row in oz. !2Ø1
133Ø REM The assumption is t
hat you plant 3X recommended
density then thin !231
134Ø DATA 1.6,1.Ø,4,.16,.Ø2,
.ØØ6,.ØØ72,.264,.Ø27,.ØØ6,.Ø
Ø5,.Ø1286,1Ø,4 !221
135Ø DATA .ØØ6,35,.Ø343,.144
,.Ø48,.Ø18,.27,.ØØ5,.Ø6 !19Ø
136Ø REM The next set of dat
a statements refers to the s
pacing for each of !Ø9Ø
137Ø REM the above crops in
inches. !Ø46
138Ø DATA 2-4,4-6,4-6,2-3,18
-24,12-18,1-3,1Ø-12,12-15,18
-24 !146
139Ø DATA 12,36-48,2-4 !Ø83
14ØØ DATA 2-3,18-24,8-1Ø,6Ø-
9Ø,1,2-4,18-24,36-48,18-24,6
Ø-9Ø !225
141Ø REM Next are the data f
or yield per 1Ø foot of row.
!197
142Ø DATA 12,15,4,15,1Ø,15,1
Ø,12,12,1Ø,9,11,1Ø,1.5,6,25,
15,3.5,4.5,15,15,25,8 !247
143Ø REM Next are the data f
or the units of the above. !
152
144Ø DATA LBS.,LBS.,LBS.,LBS
.,LBS.,LBS.,LBS.,EARS,LBS.,L
BS.,HEADS,FRUITS !2Ø3
145Ø DATA LBS.,PINTS,LBS.,LB
S.,LBS.,LBS.,LBS.,LBS.,LBS.,
.LBS,FRUIT !246
146Ø REM Here are the fertil
```

```
izer rates for a 1Ø-foot row
in terms of manure !Ø59147Ø
REM in pounds. !12Ø
148Ø DATA Ø4,Ø4,Ø4,15,12,12,
1Ø,15,1Ø,1Ø,1Ø,1Ø,15,Ø5,12,2
Ø,1Ø,1Ø,15,1Ø,1Ø,1Ø,1Ø !25Ø
149Ø REM Here are the fertil
izer rates for a 1Ø-1Ø-1Ø ch
emical fertilizer !2Ø9
15ØØ REM formulation (for a
1Ø-foot row as well) in cups
. !Ø73
151Ø 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
155Ø REM!154
156Ø FOR I=1 TO 23 !1Ø9
157Ø READ C$(I)!18Ø
158Ø NEXT I !223
159Ø FOR I=1 TO 23 !1Ø9
16ØØ READ O(I)!156
161Ø NEXT I !223
162Ø FOR I=1 TO 23 !1Ø9
163Ø READ S$(I)!196
164Ø NEXT I !223
165Ø FOR I=1 TO 23 !1Ø9
166Ø READ Y(I)!166
167Ø NEXT I !223
168Ø FOR I=1 TO 23 !1Ø9
169Ø READ U$(I)!198
17ØØ NEXT I !223
171Ø FOR I=1 TO 23 !1Ø9
172Ø READ F1(I)!196
173Ø NEXT I !223
174Ø FOR I=1 TO 23 !1Ø9
175Ø READ F2(I)!197
176Ø NEXT I !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-

Making music
How do they get so much music on one disk?

By BRUCE HARRISON
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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 two-person 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)
H	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
```

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 first-rate 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 DIS-
PLAY)
COPY "DSK2.TUNEA" (ACTION)
COPY "DSK2.TUNE1" (1st DATA FILE)
COPY "DSK2.TUNE2" (2nd DATA FILE)
```

MAKING MUSIC—

(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 INIT. 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(8192,245,138)
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("A"), 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 72117,3541 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 TI99/4A 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 informaton 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 subprograms. 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
130 REM * TRAFFIC COP * !079
140 REM *            * !174
150 REM ************** !048
160 PRINT "* TRAFFIC COP *"
!007
170 ! EXTENDED BASIC !118
180 CALL MAGNIFY(3)!224
190 CALL GRAPHICS !190
200 CALL INSTRUCTIONS !038
210 CALL CLEAR !209
220 SP=8 :: CR=0 !048
230 CALL SETUP(SP)!011
240 CALL CARS(SP)!162
250 CALL COINC(ALL,H):: IF H
THEN CALL CRASH(CR)ELSE 280
!104
260 CALL SOUND(-100,1000,5)!
111
270 IF CR>9 THEN 350 ELSE 24
0 !237
280 CALL KEY(3,K,S)!190
290 CT=CT+1 :: IF CT>75 THEN
CALL FASTER(CT,SP,BST)!016
300 IF K=83 THEN CALL MOTION
(#1,0,0)ELSE CALL MOTION(#1,
0,SP)!151
310 IF K=68 THEN CALL MOTION
(#2,0,0)ELSE CALL MOTION(#2,
0,-SP)!094
320 IF K=69 THEN CALL MOTION
(#3,0,0)ELSE CALL MOTION(#3,
SP,0)!159
330 IF K=88 THEN CALL MOTION
(#4,0,0)ELSE CALL MOTION(#4,
-SP,0)!100
340 GOTO 250 !073
350 CALL CLEAR !209
360 DISPLAY AT(6,1):"YOU CAU
SED 10 CRASHES, WITH" !070
370 DISPLAY AT(8,1):"THE TRA
FFIC RUNNING AT" !053
380 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
430 IF K<>89 THEN 400 !147
440 CALL CLEAR :: GOTO 200 !
106
450 SUB GRAPHICS !194
460 CALL SCREEN(2)!147
470 CALL CHAR(128,"FF1010101
01010FF")!066
480 CALL CHAR(129,"818181FF8
1818181")!080
490 CALL CHAR(130,"010101010
10204F8")!006
500 CALL CHAR(131,"808080808
04020IF")!035
510 CALL CHAR(132,"1F2040808
0808080")!036
520 CALL CHAR(133,"F80402010
1010101")!009
530 CALL CHAR(136,"000000FFF
F")!021
540 CALL CHAR(137,"181818181
8181818")!044
550 CALL CHAR(96,"000000007F
FFF3F3F3F3FF7F00000000000000
000FFFE1F1F1F1FFEFF")!144
560 CALL CHAR(100,"00000000F
F7FF8F8F8F87FFF0000000000000
```

```
000FEFFCFCFCFCFFFFE")!222
570 CALL CHAR(104,"080F0F0F0
F0C0C0C0F0F0FC0C0C0F0F0F07D0F0F
0F0F03030030F0F03030F0F0F0F0E0"
)!064
580 CALL CHAR(108,"070F0F0F0
C0C0F0F0C0C0C0F0F0F0F08E0F0F
0F03030F0F03030030F0F0F0F0D0"
)!068
590 CALL CHAR(112,"014163333
F3F1F1F1F1F3F7B63830030100818
3C6EEFCFCF8F8F8FCFCC9E07010")!
019
600 CALL COLOR(13,16,2,14,16
,1)!137
610 FOR I=2 TO 8 !064
620 CALL COLOR(I,16,1)!048
630 NEXT I !223
640 SUBEND !168
650 SUB INSTRUCTIONS !042
660 DISPLAY AT(10,8):"TRAFFI
C COP." !149
670 DISPLAY AT(13,2):"DO YOU
WANT INSTRUCTIONS?" !142
680 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 780 !039
710 IF K<>89 THEN 680 !172
720 CALL CLEAR !209
730 DISPLAY AT(4,2):"USE THE
ARROW KEYS (E,S,D,X)" !096
740 DISPLAY AT(6,3):"TO STOP
THE TRAFFIC AND" !092
750 DISPLAY AT(8,1):"PREVENT
COLLISIONS. WHEN TEN" !015
760 DISPLAY AT(10,3):"CRASHE
S HAVE OCCURRED YOU" !079
770 DISPLAY AT(12,2):"WILL B
E REMOVED FROM DUTY." !105
780 DISPLAY AT(18,4):"PRESS
ANY KEY TO PLAY." !089
790 CALL KEY(3,K,S):: IF S=0
THEN 790 !096
800 SUBEND !168
810 SUB SETUP(SP)!015
820 DISPLAY AT(4,1):"TRAFFIC
" !043
830 DISPLAY AT(6,3):"COP" !0
14
```

TRAFFIC COP—

(Continued from Page 34)

```
840 DISPLAY AT(4,21):"SPEED"
!206
850 DISPLAY AT(6,20):SP;"MPH
" !152
860 DISPLAY AT(20,1):"TI-99/
4A" !060
870 DISPLAY AT(20,21):"CRASH
ES" !151
880 CALL HCHAR(9,1,128,32)!2
31
890 CALL HCHAR(15,1,128,32)!
021
900 CALL VCHAR(1,13,129,24)!
035
910 CALL VCHAR(1,19,129,24)!
041
920 CALL VCHAR(1,14,32,120)!
026
930 CALL HCHAR(10,1,32,160)!
012
940 CALL HCHAR(9,13,130)!050
950 CALL HCHAR(9,19,131)!057
960 CALL HCHAR(15,13,133)!09
9
970 CALL HCHAR(15,19,132)!10
4
980 FOR I=2 TO 30 STEP 3 !02
6
990 CALL HCHAR(12,I,136,2)!0
44
1000 NEXT I !223
1010 FOR I=1 TO 22 STEP 3 !0
26
1020 CALL VCHAR(I,16,137,2)!
063
1030 NEXT I !223
1040 SUBEND !168
1050 SUB CARS(SP)!166
1060 IF SP>20 THEN SP=SP-4 !
134
1070 DISPLAY AT(6,20):SP;"MP
H" !152
1080 CALL SPRITE(#1,96,14,75
,1,0,SP)!012
1090 CALL SPRITE(#2,100,16,9
8,250,0,-SP)!097
1100 CALL SPRITE(#3,108,6,1,
128,SP,0)!057
1110 CALL SPRITE(#4,104,3,19
0,105,-SP,0)!091
1120 SUBEND !168
1130 SUB CRASH(CR)!225
1140 CALL MOTION(#1,0,0,#2,0
,0,#3,0,0,#4,0,0)!009
1150 CALL SPRITE(#9,112,9,88
```
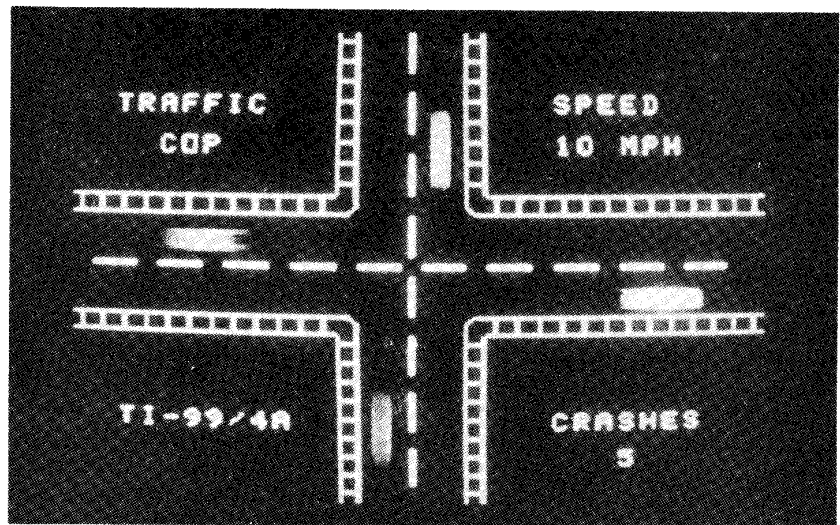


```
,120)!115
1160 CALL SPRITE(#10,112,12,
88,120,5,5,#11,112,12,88,120
,-5,-5)!219
1170 CALL SPRITE(#12,112,12,
88,120,5,-5,#13,112,12,88,12
0,-5,5)!223
1180 FOR I=0 TO 20 !105
1190 !!131
1200 CALL SOUND(-200,-7,I,11
0,I+5)!187
1210 CALL COLOR(#9,12)!053
1220 NEXT I !223
1230 CALL DELSPRITE(ALL)!115
1240 CR=CR+1 !163
```

```
1250 DISPLAY AT(22,23):CR !0
89
1260 SUBEND !168
1270 SUB FASTER(CT,SP,BST)!0
42
1280 CALL SOUND(200,-2,0,500
,5)!157
1290 SP=SP+2 !192
1300 IF SP>BST THEN BST=SP !
202
1310 CT=0 !078
1320 DISPLAY AT(6,20):SP;"MP
H" !152
1330 SUBEND !168
```

(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 GIM 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.

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 Tetrls 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 . . . . A
Ease of Use . . . . A
Documentation . . . . B
Value . . . . B
Final Grade . . . . B+

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 hi-res 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, double-density 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 CHARA1 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 CHARA1 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 saved (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	A+
Ease of Use	A
Documentation	B
Value	A+
Final Grade	A

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.
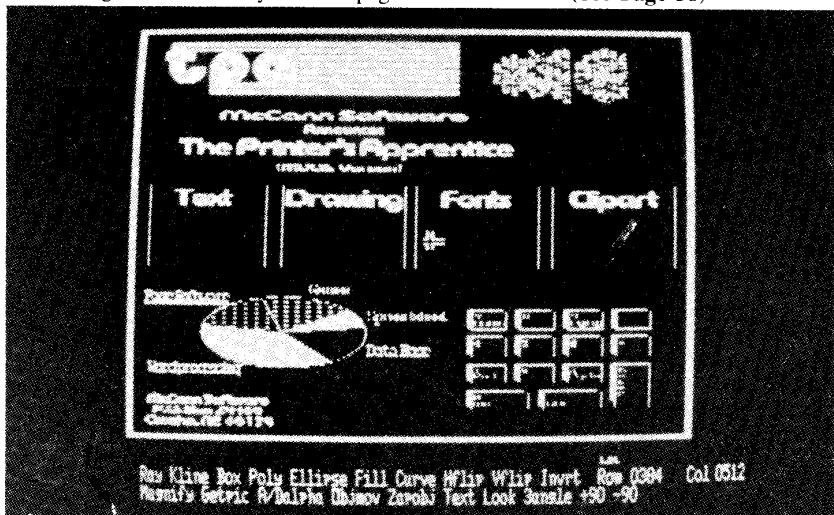
```
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--------------------------------------
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    |Above with 92k SSSD  |$145.00 |
    |MEMORY    192k DSSD  |$190.00 |
    |          256k       |$220.00 |
    |          384k DSDD  |$280.00 |
    |          512k       |$340.00 |
    |          800k       |$475.00 |
    | Add 90k Boot above  |$ 60.00 |
    |          One MEG    |$575.00 |
    |256/800 PHOENIX      |$595.00 |
    |NEW RAMBO MOD        |$ 45.00 |
----+--------------------+--------+----
    |P-GRAM kit   72k     |$150.00 |
    |NEW P-GRAM+ kit 192k |$250.00 |
    |CLOCK for P-GRAM's   |$ 20.00 |
    |  KITS incl ALL PARTS Needed |
----+--------------------+--------+----
  Pre-Built READY TO RUN ADD $30.00|
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    | MEMEX 1008k        |$305.00 |
    | MEMEX 1512k        |$365.00 |
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    |with Super cart      |$45.00 |
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****************************************
```

TPA—

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 creat-

ive 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 Tex-aments 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

MICRO-REVIEWS—

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 can 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 . . . . B
Ease of Use . . . . B+
Documentation C
Value . . . . A
Final Grade . . . . B

Cost: $8.95
Requirements: console, Extended BASIC, cassette recorder
Manufacturer: Donaldson Software, 521 Lievre St., Buckingham, Quebec, Canada J8L 2C2

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 TI 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).

FANCY

HEART

JAGGED
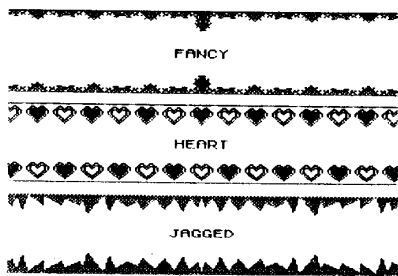
BBS relocates

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, **Kansas Geography**.

Shorock offers drill programs fo Japanese, Russian and Czech, and vocabulary filers for Japanese (Kana and Romanji), 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 611 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) 973-85C2.

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

User Notes

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,"00FF")!173
120 DISPLAY AT(3,1):"Enter s
tring to justify:" :: DISPLA
Y AT(6,1):"~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~" !233
130 DISPLAY AT(18,1):RPT$("¦
",28):"123456789012345678901
2345678" :: DISPLAY AT(21,1)
:RPT$("~",28)!238
140 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):" " !064
150 S=POS(A$,B$,T):: C$=SEG$
(A$,1,S):: D$=SEG$(A$,S+1,(2
8-S))!092
160 DISPLAY AT(9,1):C$ :: DI
SPLAY AT(11,1):D$ !065
170 IF C$="" THEN E$=D$ :: T
=G+1 :: GOTO 150 !172
180 E$=C$&B$&D$ !204
190 DISPLAY AT(17,1):E$ :: A
$=E$ :: IF LEN(A$)=28 THEN 2
20 ELSE T=S+G !236
200 DISPLAY AT(23,1):"Press
any key to continue..." !099
210 CALL KEY(0,X,Y):: IF Y=0
 THEN 210 ELSE 150 !015
220 DISPLAY AT(5,1):A$ :: DI
SPLAY AT(22,1):"Text is now
right-justified.":" ":" " !1
03
230 CALL KEY(0,Y,X):: IF X=0
 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

User Notes

son, SC 29631'(803)6540000

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 RAMdisk. 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.

User Notes

(Continued from Page 45)

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)
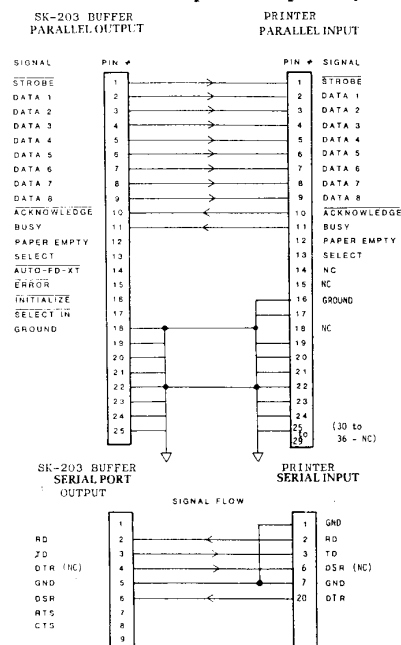
Heathkit SK-203
Buffer to Printer (Serial) Cables
(Using Radio Shack TRP-100 Printer)
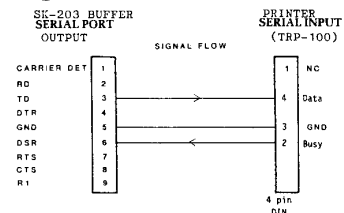
If you can pick up one of these buffers at a good price, I'd say — Go for it! The kit requires lots of careful soldering, but all IC's are socketed, which makes it a little easier, both for the building and for any required fault-finding.

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.

There is no catalog, but the disks are packed with programs that are available from bulletin boards and other sources. Some of the software may be shareware and buyers are responsible for sending the authors a payment (usually in the $5-$10 range) if the programs are used. MICROpendium highly recommends payment to shareware authors as an incentive to continue software support of the Geneve. The fees charged by MICROpendium are for media, postage and handling only and do not include shareware fees.

MICROpendium also offers MDOS 1.14F, MDOS 0.96h and MDM5 v1.29 at no charge to readers who supply disk(s), self-addressed return mailer with postage.

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