

MICROpendium

Volume 12 Number 10

November 1995

\$3.50

Chicago fair keeps interest of TI faithful

**Term 80, AMS card, PC99,
new software gain attention**
See stories pages 4 and 8



Bud Mills with SCSI card

Also inside

- ◆ The art of assembly
- ◆ A plea for C
- ◆ The meaning of Funnelweb
- ◆ Set your clocks
- ◆ Reviews of Canon BJC-4000 printer, Christmas Music, Music Programming Aids, Plotter, PRINST. INSTEDIT, The Harrison Drawing Suite



TIers at the fair

Photos by Gary Cox

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MICROpendium

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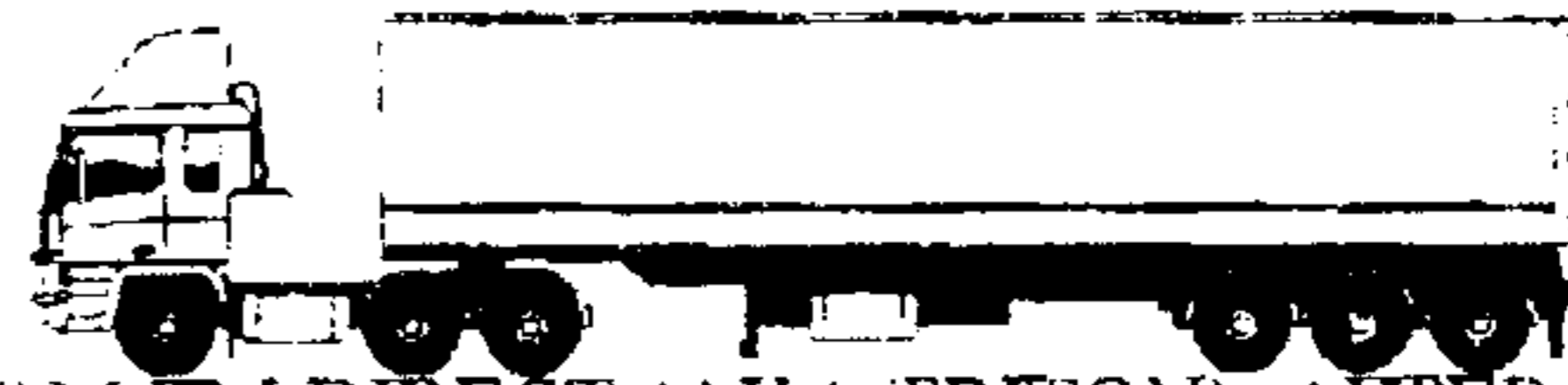
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*READ THIS

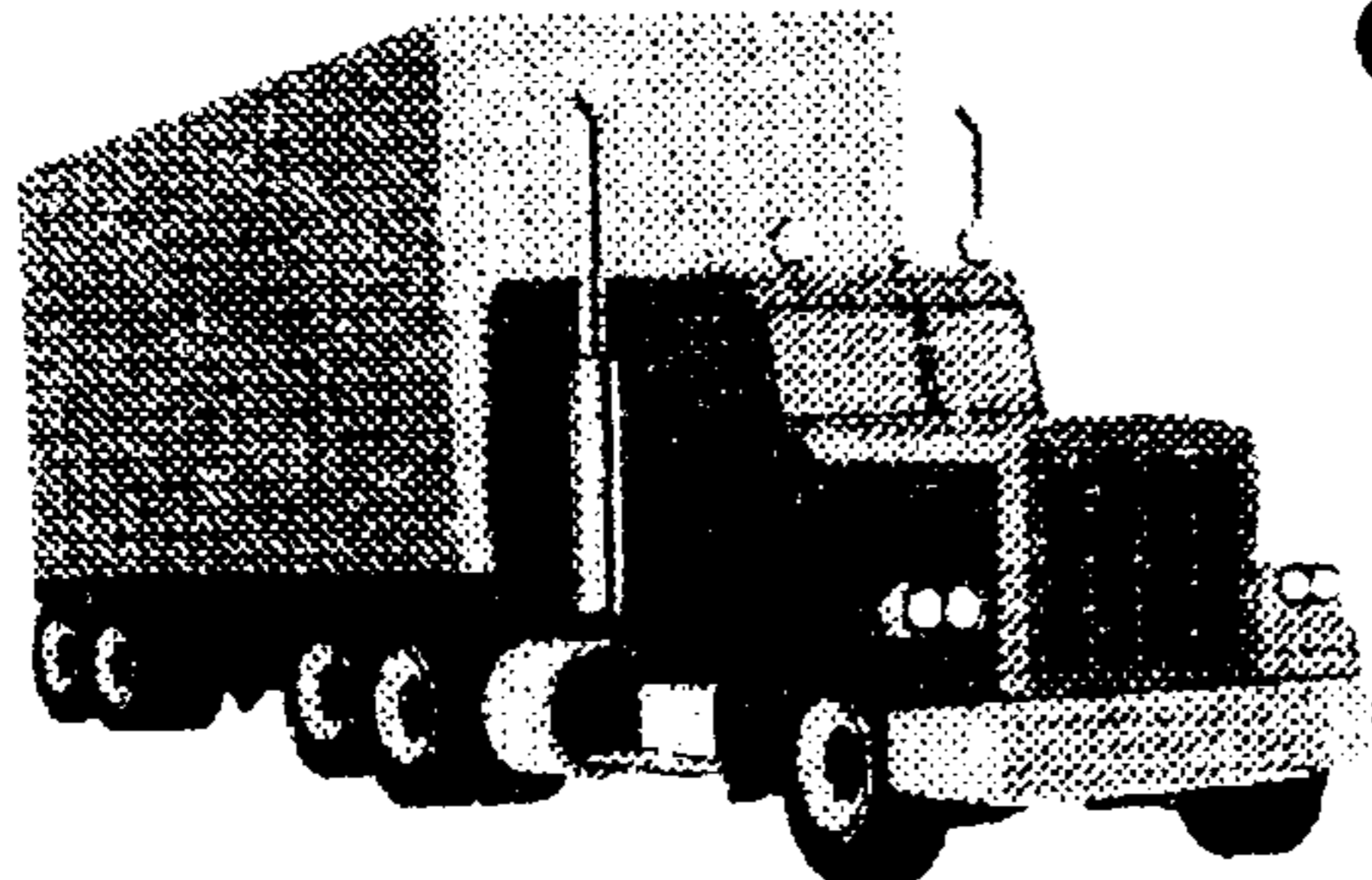
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2. Long Extended BASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

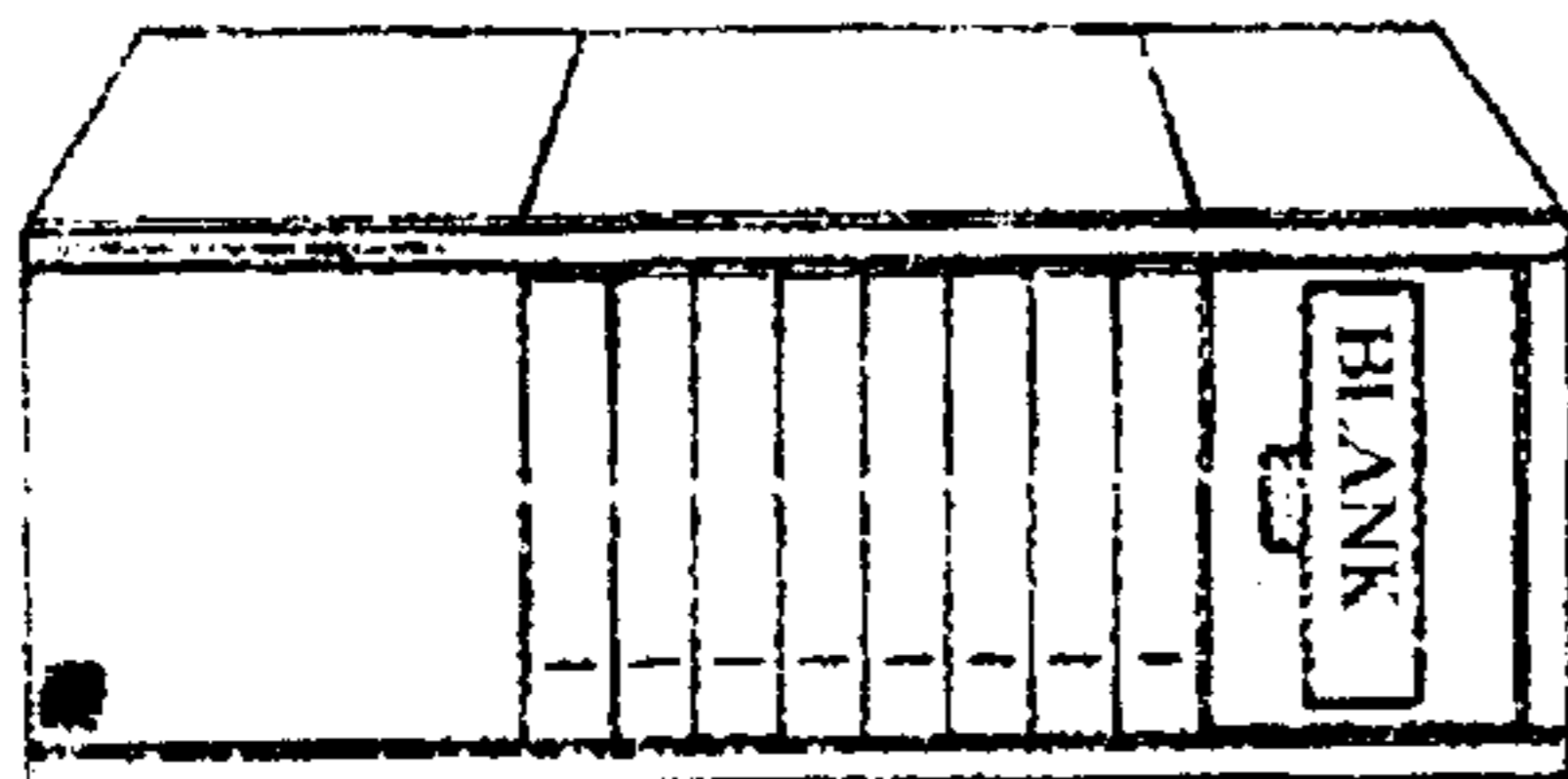
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COMMENTS

News from Chicago

The Chicago TI fair has come and gone and for many visitors the workshops once again were worth the trip alone. There were fewer vendors than in years past, but most of those who were there offered worthwhile products. They also had time to talk about their wares and run demos.

TERM 80

One of the most interesting workshops focused on the Super AMS card and Term 80. Charles Good hosted the session. While there were several equipment failures during the session, the demo of Term 80 captured the interest of a number of Tiers who use the Internet. The program was written by Jeff Brown.

Among its many features, the most obvious is the fact that it emulates an 80-column screen on a standard TI99/4A. It does this without any hardware whatsoever. No 80-column card. No special video adapter. No special monitor. It's done entirely through software using a composite monitor. However, don't expect the 80-column mode to be as clear as 80-columns on a Geneve. The program uses smaller characters scrunched closer together than a TI99/4A user may be used to. The 80 columns are achieved by making each character only 3 pixels wide and eliminating the spaces between the characters. It may seem unlikely, but it's readable, and that's all that really counts if you're trying to do some surfing on the Internet. In addition, it fully supports VT-100 emulation and 8-color ANSI.

If you haven't tried the Internet, you might wonder why make a big deal out of Term 80. The fact is that most parts of the Internet expect you to be using an 80-column terminal. In some cases you can get by with 64 columns, which Term 80 also emulates, but 32 columns, or even 40, isn't enough. Lines of text get doubled over. Menus get jumbled and scroll off the screen before you have a chance to read them. It's so difficult to use a 32-column screen that most users probably would give up after the first several attempts. Term 80 changes all that.

If you want to use a TI99/4A to access the Internet but don't have an 80-column device of some sort, you need Term 80. Term 80 is available on various electronic services in a slightly disabled form. I recommend spending the \$15 for the full version and order it from Brown at 2111 Montreal Rd., #102, Gloucester, Ont. Canada K1J 8M8; (613) 746-1013; email bb737@freenet.carleton.ca.

BARCODE SOFTWARE

Another very interesting program making the rounds at the fair is TI-Bar, a barcoding program for the TI. Barcoding, of course, results in those horizontal and vertical lines that you find imprinted on more and more mail. The barcodes allow the post office to handle the mail more efficiently, which results in faster delivery at a cheaper price for the mailer. The program works with a variety of printers, including ink jet, and 9-pin and 24-pin dot matrix printers. I was told by users at the fair that it also works with laser printers, but the documentation that comes with the program doesn't mention lasers. However, I wouldn't be surprised. In addition to printing barcodes, it also prints the labels and return address on envelopes or sheets of paper. A number of folks were mentioning how useful this program could be for user groups who have regular mailouts. It could be useful to anyone who uses the mail. The program was written by William F.S. Dowling.

Bud Mills reported progress with the SCSI, handing out EPROMs to SCSI owners who have TI systems. You may recall that until recently the SCSI worked only with the Geneve. With the chip, which can be ordered from Bud at 166 Dartmouth Dr., Toledo, OH 43614; (419) 385-5946, a TI user with a SCSI card can format a drive, write and delete files. However, other disk management functions, such as running a directory, aren't available, yet. For now, TI SCSI users who want to keep track of their files have to keep a list, but progress is being made. And that's good to see. By the way, the card supports drives up to 250 megabytes.

AMS SOFTWARE

A program designed for the Super AMS card, AMS Copy, was also demonstrated at the fair. Super AMS, of course, is the Asgard-developed memory card for the 4A. It replaces the 32K expansion and adds anywhere from 96K to 224K for use by Super AMS programs, or programs adapted for use by Super AMS. The 32K works just like any other memory expansion. I believe the standard size of the card, since the Southwest Ninety Niners took over support, is 256K. Asgard configured the base unit at 128K. AMS Copy can copy as much as an entire DSSD disk into memory — using the 256K AMS card — and then write the contents to floppies, formatting them on the fly. Larger disks are copied in two passes. Unlike track copier, AMS Copy detects errors and reports them, so you know your copies will be good. According to Charlie, BJ Mathis, who developed AMS copy, wants to incorporate it into DM-1000 and give it the capability of copying to multiple drives.

It was also reported that Tony McGovern now has a Super AMS card and wants to use it to modify the 40-column version of Funnelweb so that 40-column users will have access to a large text buffer, just as 80-column users do. And Jeff Brown is said to be enhancing his Term 80 so that all of its modules will load into AMS memory simultaneously. Obviously, Term 80 would run faster with this feature.

PC99 UPGRADE, ETC.

Mike Wright demonstrated a pre-release version of PC99 V. 3A. He calls its debugger "the most powerful tool available for the 4A. There are no secrets." The debugger lets the user see everything a program does while it runs. Wright also reported that he now has permission from TI to distribute its entire library of programs, including the original documentation. However, buyers won't get a hard-copy version of the manuals. Instead, Wright is scanning the documents into a PC and distributing them as WordPerfect Envoy files.

There were a number of other products to look at, including Load Master, a work in progress by Mickey Cendrowski, Mike Wright's version 3A of PC99 and a high-speed GPL card that replaces GROM 0 in the 99/4A. It is said that this card increases the speed of the 4A by a factor of six!

I thought that Hal Shanafield and the Chicago TI group ran a fine, low-keyed fair. The layout of the Evanston Public Library was excellent, with the seminar room conveniently located across the hall from the exhibit room. I'm not sure how happy the commercial vendors were, because the attendance was down from last year, but I had a good time.

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FEEDBACK

Be polite, or else

Where is Amy Vanderbilt now that we need her? Now that MANNERS has died, are manners also dead? What is Harrison talking about here?

Amy Vanderbilt may be remembered by some as the principal arbiter of etiquette in the U.S. MANNERS (upper case) was the Washington, D.C., area users' group. Manners (lower case) is another word for etiquette. What's annoying Harrison is the lack of manners among many in the TI "community" and its possible impact on our survival.

From time to time, we send out packages of software to various people in our "community." The stuff is sent *free* to the recipient, and accompanied by a letter which usually asks the recipient to test that software and let us know how it worked on that person's system. Some always respond. We always get responses from Charles Kirkwood, John Bull, Earl Raguse and Phil Van Nordstrand, for example. There are others, however, who simply don't "answer the mail" in any fashion. Not only is this bad manners, it hurts the "community" in two ways. First, we don't find out what works and doesn't on other configurations of TI systems. Second, the lack of responses makes us reluctant to try out new ideas, and in general stifles our creative spirit.

Those who *have* written to us know that we answer all mail, and usually make efforts to correct any problems found with our software. Of course, it's not always possible to correct problems, but we at least respond in some manner. Those of

you who've not bothered to test software, or who've not bothered to let us know the results (you know who you are) should be just a trifle ashamed. We spend many hours (and our own dollars) preparing packages to be sent out for testing, and when we don't even get a simple "thank you" note, it hurts.

Given this lack of manners, we're tempted just to give up, but some of our friends, like Mr. John Murphy, of Dorset, England, who's even made transoceanic phone calls to say thanks, keep our spirits up. Those who continue to exhibit complete lack of response will be removed from our mailing list. Don't complain that you've not been warned.

Bruce Harrison
Hyattsville, Maryland

Hooray for MICRO, says long-time reader

I just want to tell you how I appreciate the great job that you're still doing for the TI99/4A computer. I look forward to each month of getting the MICROpendium.

I have been a subscriber since 1990 and this magazine gives me a lot of information that is so very helpful, and whom to contact for new, as well as old, software and hardware.

I just can't believe what some of the readers are complaining about the MICROpendium, because it's the only one magazine that supports the TI99/4A still.

A lot of people do not realize that a lot of the programs for the other computers are credited to the TI99/4A. If any of you read or check with authors you will find

that there is a lot of new software hardware out there for the TI99/4A like the CD-ROM-SCSI hard drive, the AMS system. Some people don't have the money but when you want to upgrade that is your privilege only. Only you know what you want. For others, don't speak for them.

All I can say to the publisher is keep up the very wonderful job that you are doing. A job well done.

I'm also the president of the Dallas TI Home Computer Group.

Mattie Bush
Dallas, Texas

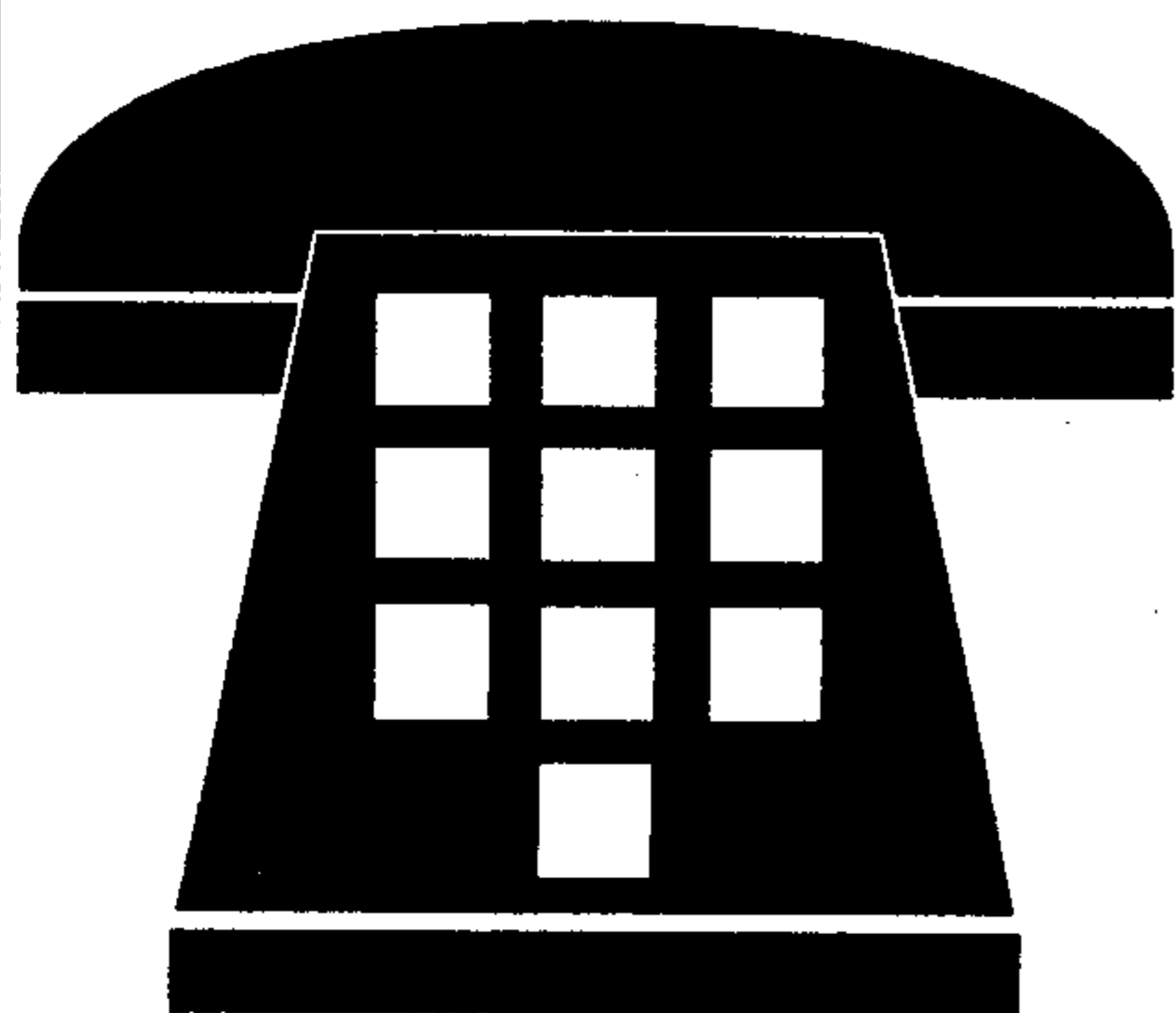
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READER TO READER

Stan Ulanoff says he has three Peripheral Expansion Boxes available free to anyone who wants to pay shipping.

Write him at 113 N. Carondelet Court, Mobile, AL 36608. Phone (334) 342-1646; fax (334) 342-1675.

Reader to Reader is a column to put TI and Geneve users in touch with other users. Address questions to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680. We encourage those who answer the questions to forward us a copy of the reply to share with readers.



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Floating on Internet waters



TI users learn to navigate

By JOHN BULL

Have you ever been in a small sailboat on the ocean? Yachts cruise by, leaving you in their wake, but you wouldn't swap places, that is, if you have any sense of adventure!

A few months back I launched my trusty little TI99/4A into the deep, wide, waters of the Internet. Loaded and ready with Myarc 512, Horizon RD, 2400 baud modem, and reliable old TELCO, we signed on Delphi for \$10 per month plus \$3 for Internet access. That gave us four hours per month (more costs more) of net time and I have not wasted a single minute.

First, it took a week or two to master the art of logging on and maneuvering the menus — not hard, but it does take some learning with the help of the Delphi manual. You set up TELCO to dial the local Sprintnet access phone number, oops! — not remembering to tell TELCO to log the screen to Myarc 512. Then a fancy little logon routine with cryptic key presses, then user name and password. Shortly, here comes the welcome message and main menu.

Remember, you are in a little boat in channels charted for big ones. The screen is all 80 columns and you have only 40! Fortunately they pause at the bottom of each 24-line page and <f>5 scrolls left and <f>3 scrolls right, letting you read it all; <enter> gets on to the next page. It is not too handy but it works.

The real secret of success is logging the screen to whatever disk memory you have, and sometimes you need a lot. After sign-off you can then load the log files into the Funnelweb editor and read, edit, and save as much (or little) as you want. I use LOG/1 as a filename and TELCO fills it with a buffer-full (10K or so) and then updates to LOG/2, etc., automatically.

Delphi and other nets have all sorts of interesting and valuable things immediately available on-line — the encyclopedia is real handy and I have used it — but the first attraction for me was TI NET, which includes a lively forum and a big database for free downloading of TI stuff.

The Forum includes Tony McGovern as an active participant plus a lot of friendly, knowledgeable people who are generous with advice and information. Did you know that CALL ABSP will abort the contents of the Myarc printspooler? I do now (it is not in the manual) thanks to an inquiry on the forum.

The database is easy to use once you find what you want — it may take some looking since KEY WORDS are not always what they seem. TELCO's Xmodem works flawlessly for me for both downloading and uploading files. My "WINDOWS for the TI" is now there for anyone who wants it. A lot of the program files are for 9640 users, which is good or bad, depending on the point of view. Your boat may be bigger than mine.

Beside the TI Forum, the Internet was the chief attraction for me. E-mail is quick — usually fractions of seconds to deliver. If you know an address, mine is in %"bulljh@delphi.com"; you type MAIL SEND, give the address, add your message, type <c>Z, and it is on its way.

The TELCO macros are very useful for addresses, since e-mail addresses are sometimes long and complex and precision is essential. One wrong keystroke, and it doesn't go. I keep about a dozen addresses as macros that are instantly available with <f>M plus the appropriate single key press.

Editing messages on the screen can pretty tricky for a low grade typist like me and so I prefer, if they are more than a line or two long, to type them in advance and save them as text files using PF, then C DSKn.filename. This eliminates printer codes, which do not fare well on the Internet. The message can then be placed on the screen with TELCO's ASCII file uploader. It is quick and easy.

Tom Wills has undertaken to keep updated the list of TI user e-mail addresses that he recently published in MICROpendium. His address is twills@indirect.com and he says that he will send the list to those who ask. This should help the TI community stay in touch.

As you may already have heard, the In-

ternet is a *really* big ocean. Plain e-mail is just sticking your toe in. Recently, our local newspaper published the address of a server, LISTSERV, that if asked will send you a complete list of all the lists on the Internet. Well, I asked and I received — about 7,500 listnames, addresses, and descriptions marching up my screen for over two hours! It took all the Myarc 512 plus all available Horizon space plus most of a floppy to get all of it. Are you interested in dogs? Which breed? There is a list for you! A list for almost every conceivable interest! It took several more hours with Funnelweb to edit the 7,500 down to about 150 lists that might have some interest to me or my friends.

Several of those 150 looked really interesting, so I picked out one in my professional field and sent an e-mail message saying SUBSCRIBE, as instructed. In the next three days there were more than 350 e-mail postings to my address and they must have averaged two typed pages each. Most were amateurs holding forth without limitations — if they felt like saying something, they did so, and at length. My Delphi mailbox began to fill up with much more than I had time to read. How to stop it? Easy! Just send e-mail, RESIGN, and they quit sending.

There was one big plus from the experience — a friend from 40 years back was author of one of the first messages and that has led to a pleasant renewed contact via private e-mail. You never know who you will meet!

Finally, how does the TI99/4A perform on the Internet? Plenty well enough to be fun and valuable. Anything that is in plain English, ASCII text, or TI program files can be handled. The whole ocean of material that can be found through gopher and its helpers is right there for the taking. Thousands of interest groups, some matching your interests, are just waiting for you to join them. Windows, a really fast modem, and a few megs of memory, for instance, would add capabilities that we do not have. Thank you, but *no!* My own little sailboat is more fun.

Chicago TI Faire

New card from Germany boosts TI speed 6 times

By GARY W. COX

The 13th annual Chicago TI Faire has now come and gone. This year's faire was held at the Evanston Public Library in Evanston, Illinois, which is a suburb of Chicago. The weather this year, as is usual, was wet as vendors carted equipment into the library. Some problems with both Holiday Inn and the library slightly dampened the event but these problems were out of the control of the Chicago TI UG. However, the library meeting room was plenty large and the seminar room very close which made for a good event. It was also really good to see all the hard core Tiers once again!

Attendance to the faire this year was about the same as last year's event but vendor attendance was down. Scheduled to have tables were many different user groups, many of which didn't show, and a few regular vendors were noticeably absent.

Despite a few missing vendors many new products were released at the Faire. Those coming into the faire were given a special event newsletter as well as a free copy of an electronics/computer/ham radio magazine called *Nuts & Volts* which was used for some of the advertising for the Faire.

New from Cecure Electronics was a very neat program called TI BAR CODE written by William F.S. Dowling. TI BAR CODE will run on a TI99/4A or Geneve in Extended BASIC. This program produces the bar codes used by the post office in routing your mail! Thus, with the ability to create the same bar code that the post office creates to route mail, already having that bar code on the letter saves the post office one step! You may have not noticed this bar code before but take a look at some of your mail and often you will see a bar code printed on it somewhere below the address. A computer at the post office scans this bar code to determine the destination of a letter thus elimi-

nating the necessity of a human having to do the routing by hand. This program sells for \$15. I commend William Dowling for a job well done writing a complicated program to produce these bar codes! Don Walden of Cecure Electronics also had clock cards available for the 4A for only \$34. Don also was selling a neat device which splits off the audio from the 4A console to where head phones can be connected, thus allowing one to listen to the sounds from the 4A privately. Also remember Cecure Electronics is an authorized repair center for all TI99/4A, CC40 and Myarc products but can often repair some third party products as well.



Charles Good demonstrates Term 80 at the fair.
(Photo by Gary Cox)

Ada and Ron Markus of Ramcharged Computers had several tables of mostly software and some hardware such as the Asgard Mouse. Recently Ramcharged Computers purchased the remaining stock of Asgard Software which was on display and updates to some of the programs are expected in the near future. New for the faire was a neat Tunnels of Doom game called Hall of Lost Moria which sold for only \$4.95! Also new was a version of Clippix called Clippix Plus which is written for systems with an 80-column card. An announcement of other new products for Ramcharged Computers is expected soon!

Bud Mills of Bud Mills Services was giving out EPROMS for the SCSI (small computer systems interface) cards! On a Geneve and using MDOS 4.0 any SCSI hard drive can be used. At this time CD-

ROMs are limited to just playing music with the current version. Version 4.01 of MDOS, expected to be released soon, will provide floppy drive and ZIP drive support! On a TI99/4A the SCSI EPROM is still in the beta test stages but in its current version it will still control a SCSI hard drive. The hard drive can be accessed in the same manor as any other device such as typing "OLD SCSI1" the same as using "OLD CS1"; Bud also had his assortment of the usual Horizon RAMdisks!

Berry Harmsen of the Dutch TI Users Group in Amsterdam, The Netherlands, had a really neat new device which plugs into the PEB and replaces the TI99/4A console GROM 0-3. With this GROM card in place and some modifications to the TI console the TI99/4A will run six times faster! The card, which was produced by Michael Becker and Gerd Weissmann Germany is not yet available in the USA. However, you can write to them if you wish by writing Gerd Weissmann, Konigstr. 17-19, D-67655 Kaiserslautern, Germany or Michael Becker, Diedesfelder St. 12, D-68309 Mannheim, Germany. Perhaps one of the TI vendors in the USA can pick up on this new card?

Mike Wright of CaDD Electronics was present showing a prerelease version of PC99 (TI Emulator for PCs) version 3a. This new version included upgrades in some of the utilities such as a "disk find search for any TI file on disk" and an artist utility which can display TI-Artist files. An overlay function was also added to PC99 as since an overlay can't be placed on a PC keyboard like on a TI99/4A the function keys to obtain the functions of the overlay on a PC are displayed on the screen. Another feature added was a TRACE function to trace the progress of events as the system runs. Mike also recently obtained permission from Texas Instruments to release all of TI's disk-base programs (like the ones with the brown label) and already has permission for the cartridge-based programs. He also can

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CHICAGO FAIRE —

 (Continued from Page 8)

now provide the documentation for many of the programs on a PC disk with a special viewer to view it showing the manual in color with graphics; thus, the manuals are displayed in their original format rather than a text-only conversion. Those who have purchased PC99 will be receiving update information in the mail when the latest version is released.

Ricky Bottoms of RBD Enterprises had an assortment of equipment and cartridges for sale including TI modulators, various PEB cards and keyboards.

Bob Retzler of JOA Midwest had a huge assortment of mostly PC CD-ROMs for sale including games, utilities and programs.

As for the user groups, the Chicago TI Users Group represented at the table by Victor Steerup and Dave Connery had the user group library as well as an interesting 3D display on a TI99/4A. Victor had a console setup running TIM (80 column device) connected to some electronic 3D glasses which are in turn connected to the video output of the console. Therefore, when using these glasses and viewing images written in 3D graphics format, the images appear to our eyes to be in 3D! Also available at the Chicago TIUG table was a new assembly language poker game by Marcel's Software with assistance from Bruce Harrison.

Charles Good of the Lima TI User Group had a system set up where any program from Jim Peterson's library could be copied. He also had copies of the demo version of TERM 80 and RXB (Rich Extended BASIC).

William Lucid of the Hoosier Users Group (assisted by Jeff White) had a variety of publications available. Michael Mickelsen of The Windy City TI User Group had a variety of hardware and software for sale. The Milwaukee Area Users Group also representing Arcade Action Software had a variety of hardware and software including some CC40 items. Peter Kraus of the Will County TI users group had a variety of hardware and software as well for sale! The Mid-South (Memphis) TI users group, of which I am president, had a table with a variety of hardware and software for sale, including

Vendors at the Chicago fair

Arcade Action Software, 4122 Glenway, Wauwatosa, WI 53222

Bud Mills Services, 166 Dartmouth Drive, Toledo, OH 43614, Phone: (419) 385-5946

CaDD Electronics, 45 Centerville Dr., Salem, NH 03079-2674, Phone: (603) 895-0119 or (603) 893-1450

Chicago TI Users Group, P.O. Box 7009, Evanston, IL 60204, Phone: (708) 864-8644

RBD (Ricky Bottoms) Enterprises, 643 Fair Ave., Shelbyville, IN 46176, Phone (317) 392-0293

Cecure Electronics Inc., S74 W17000 Janesville Road, P.O. Box 132, Muskego, WI 53150-0132, Phone: (414) 679-4343 or 1-800-959-9640, FAX: (414) 679-3736

Hoosier TI User Group, P.O. Box 2222, Indianapolis, IN 46206-2222, Internet: lucid@indy.net

JOA Midwest, 776 Willow, Elmhurst, IL 60126, Phone: (708) 782-6012

Lima TI User Group, P.O. Box 647, Venedocia, OH 45894, Phone: (419) 667-3131 or Internet: cgood@osulima1.lima.ohio-state.edu

Marcel's Software, 5705 40th Place, Hyattsville, MD 20781-1727.

Mid-South (Memphis) TI99/4A Users Group, P.O. Box 38522, Germantown, TN 38183-0522, Phone: (901) 358-0667, Internet: gary.cox@stjude.org

Milwaukee TI Users Group, 4122 Glenway, Wauwatosa, WI 53222, Phone: (414) 422-9648 or (414) 679-4343

Ramcharged Computers, P.O. Box 81532, Cleveland, OH 44181, Phone: (216) 243-1244

Vereniging TI-Gebruikersgroep (Dutch TI User Group), 1e Osterparkstr.141e 1091 GZ Amsterdam, The Netherlands.

Will County TI Users Group, 1400 Caton Ave, Joliet, IL 60435, Phone: (312) 283-2359

Windy City TI User Group, 1549 Webster Lane, Rosemont, IL 60018-1423

a Geneve. While some other groups didn't have tables, representatives of several other user groups were present at the faire. Then last but not least John Koloen of MICROpendium was present and had free copies of MICROpendium available for everyone. If I have left anything or anyone out I must apologize but I hope John Koloen will cover in his article what I missed in this article.

I would like to thank Hal Shanafield (Faire Chairman) and the Chicago TI Users Group for all the hard work that they put into getting this event together as I really had a good time! Thanks again Hal!

If at all possible please try to attend a TI faire and support the

vendors. Other fairs coming up include the Fest West Feb. 17 in Tucson, Arizona, and the Multi Users Group Conference May 25 in Cleveland, Ohio. Berry Harmsen of the Dutch TI users group mentioned that a TI Faire is planned for Germany and I hope that information will be in MICROpendium as soon as the details arrive. The TI community depends on the support of everyone reading this article. Support the fairs, go to your local user group meetings, buy from the vendors, tell the shareware authors at least thanks for their work and last but not least continue your support for MICROpendium. Without MICROpendium the TI community would fall apart fast!

You can set your clocks with this program

The following program, called **CLOCK**, comes from the British Columbia 99er Users Group. This program will find any clock in your system and display all information and allow you to set the clock. Several subprograms were used to give all the information and the main program seeks out the clock and displays the information. The program shows the date, day, time, and the type of clock you have in your system. Thanks to Jerry Stern for the date and day subroutines.

The biggest problem with this program is making the MBP clock react like the others. The Triple Tech and Myarc clocks are devices but the MBP clock is at an address, so it does not work like the rest. If you feel like making a donation, send no more than \$2 to the B.C. 99ers, 216 10th Ave., New Westminster, B.C., Canada V3L 2B2.

Here is the listing.

CLOCK

```

100 REM MBP CLOCK OWNERS -
CHANGE LINE 730 J$="95"
TO CORRECT YEAR !219
110 @=0 :: [=1 :: ]=2 :: _=3
:: \=4 :: GOTO 140 :: CLOCK
$,D$,DAY$,H$,HR$,I$,J$,K$,L$,
M$,MIN$,MON$,N$,O$,P$,S$,SE
C$,TM$,X$,YR$ !196
120 DATE,DAY,HOUR,I,J,K,MINU
TE,MONTH,SEC,X,Y :: CALL CHA
R :: CALL COLOR :: CALL HCHA
R :: CALL INIT :: CALL LOAD
:: CALL SCREEN :: CALL SOUND
:: CALL VCHAR :: DEF SET=X+
6*INT(X/10)!127
130 !@P-
140 CALL INIT :: DISPLAY ERA
SE ALL :: FOR X=@ TO 13 :: C
ALL COLOR(X,16,[):: NEXT X :
: CALL CHAR(132,"80808080808
08080010101010101010000000
0000000FFFF")!244
150 CALL E(H$,I$,J$,K$,L$,M$,
N$,O$):: IF I$="" THEN 160
ELSE 180 !136
160 CALL F(H$,I$,J$,K$,L$,M$,
N$,O$):: IF I$="" THEN 170
ELSE 180 !147
170 CALL G(H$,I$,J$,K$,L$,M$,
N$,O$):: IF N$="0" THEN 250
ELSE CALL SCREEN(14)!100
180 CALL VCHAR(\,\,133,15)::
CALL VCHAR(\,29,132,15):: C
ALL HCHAR(_,5,134,24):: CALL
HCHAR(19,5,135,24):: DISPLA
Y AT([,[]:O$ :: DISPLAY AT(5
,10)SIZE(10):"Today is:" !20
2
190 J=VAL(I$):: K=VAL(H$)::
I=VAL("19"&J$):: CALL DATE(J
,K,I,P$):: CALL AMPM(L$,M$,T
M$):: CALL DAY(J,K,I,K$):: X
=LEN(P$):: Y=((28-X)/!)):: DI
SPLAY AT(9,Y)SIZE(18):P$ !16
1
200 X=LEN(K$&" "&TM$):: Y=((
28-X)/!)):: DISPLAY AT(12,Y)S
IZE(18):K$&" "&TM$ :: DISPLA
Y AT(22,5):"Set the Clock? Y
/N" :: ACCEPT AT(22,24)VALID
ATE("YyNn"):S$ !140
210 IF S$="N" OR S$="n" THEN
DISPLAY ERASE ALL :: CALL L
OAD(-31962,100,130):: END !0
91
220 CLOCK$=SEG$(O$,6,[):: IF
CLOCK$="1" THEN 430 !118
230 IF CLOCK$="y" THEN 540 !
170
240 IF CLOCK$="M" THEN 260 !
101
250 CALL SCREEN(7):: DISPLAY
AT(10,6)SIZE(18)BEEP:"No cl
ock in system" :: FOR X=[ TO
500 :: NEXT X :: CALL LOAD(
-31962,100,130):: END !220
260 !!131
270 DISPLAY ERASE ALL :: DIS
PLAY AT(,8):"MBP Clock set"
!239
280 DISPLAY AT(8,):"Enter t
he day (Sunday =1)" :: ACCEP
T AT(8,28)VALIDATE(DIGIT)SIZ
E(!)BEEP:X$ :: IF (X$<"1")OR
(X$>"7")THEN 280 !001
290 X=VAL(X$):: DAY=SET !227
300 DISPLAY AT(10,12):"MM/DD
/YY" :: DISPLAY AT(12,12):"H
H:MM:SS" !022
310 ACCEPT AT(10,12)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :: I
F (X$<"01")OR(X$>"12")THEN 3
10 !013
320 X=VAL(X$):: MONTH=SET !1
39
330 ACCEPT AT(10,15)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :: I
F (X$<"01")OR(X$>"31")THEN 3
30 !037
340 X=VAL(X$):: DATE=SET !03
5
350 ACCEPT AT(10,18)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :: I
F (X$<"90")OR(X$>"99")THEN 3
50 !082
360 ACCEPT AT(12,12)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :
F (X$<"00")OR(X$>"23")THEN
60 !066
370 X=VAL(X$):: HOUR=SET !06
7
380 ACCEPT AT(12,15)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :: I
F (X$<"00")OR(X$>"59")THEN 3
80 !098
390 X=VAL(X$):: MINUTE=SET !
215
400 ACCEPT AT(12,18)VALIDATE
(DIGIT)BEEP SIZE(-):X$ :: I
F (X$<"00")OR(X$>"59")THEN 4
00 !121
410 X=VAL(X$):: SEC=SET !224
420 CALL LOAD(-31164,SEC,@,M
INUTE,@,HOUR,@,DAY,@,DATE,@
MONTH):: CALL SOUND([,20000,
30):: DISPLAY ERASE ALL :: F
OR X=@ TO 1000 :: NEXT X ::
GOTO 170 !253
430 DISPLAY ERASE ALL :: OPE
N #[:"CLOCK" :: DISPLAY AT(,
_):"Triple Tech Clock Set"
!208
440 DISPLAY AT(8,):"Enter
he day (Monday =0)" :: ACCEP
T AT(8,28)VALIDATE(DIGIT)SI

```

(See Page 11)

CLOCK —

(Continued from Page 10)

```

E( )BEEP:D$ :: IF (D$<"0")OR
(D$>"6")THEN 440 !086
450 DISPLAY AT(10,12):"MM/DD
/YY" :: DISPLAY AT(12,12):"H
H:MM:SS" !022
460 ACCEPT AT(10,12)VALIDATE
(DIGIT)BEEP SIZE(-):MON$ ::
IF (MON$<"01")OR(MON$>"12")
THEN 460 !089
470 ACCEPT AT(10,15)VALIDATE
(DIGIT)BEEP SIZE(-):DAY$ ::
IF (DAY$<"01")OR(DAY$>"31")
THEN 470 !067
480 ACCEPT AT(10,18)VALIDATE
(DIGIT)BEEP SIZE(-):YR$ ::
IF (YR$<"90")OR(YR$>"99")THE
N 480 !205
490 ACCEPT AT(12,12)VALIDATE
(DIGIT)BEEP SIZE(-):HR$ ::
IF (HR$<"00")OR(HR$>"23")THE
N 490 !138
500 ACCEPT AT(12,15)VALIDATE
(DIGIT)BEEP SIZE(-):MIN$ ::
IF (MIN$<"00")OR(MIN$>"59")
THEN 500 !126
510 ACCEPT AT(12,18)VALIDATE
(DIGIT)BEEP SIZE(-):SEC$ ::
IF (SEC$<"00")OR(MIN$>"59")
THEN 510 !121
520 X$=D$&"", "&MON$&"/"&DAY$&
"/"&YR$&","&HR$&":"&MIN$&":"
&SEC$ :: PRINT #[:X$ !103
530 CLOSE #[: DISPLAY ERAS
E ALL :: GOTO 150 !094
540 DISPLAY ERASE ALL :: OPE
N #[: "TIME", INTERNAL, FIXED :
: DISPLAY AT(, _):"Myarc Clo
ck Set" :: DISPLAY AT(10,12)
:"MM/DD/YY" :: DISPLAY AT(12
,12):"HH:MM:SS" !097
550 ACCEPT AT(10,12)VALIDATE
(DIGIT)BEEP SIZE(-):MON$ ::
IF (MON$<"01")OR(MON$>"12")
THEN 550 !180
560 ACCEPT AT(10,15)VALIDATE
(DIGIT)BEEP SIZE(-):DAY$ ::
IF (DAY$<"01")OR(DAY$>"31")
THEN 560 !158
570 ACCEPT AT(10,18)VALIDATE
(DIGIT)BEEP SIZE(-):YR$ ::
IF (YR$<"90")OR(YR$>"99")THE
N 570 !040
580 ACCEPT AT(12,12)VALIDATE
(DIGIT)BEEP SIZE(-):HR$ ::
IF (HR$<"00")OR(HR$>"23")THE
N 580 !229
590 ACCEPT AT(12,15)VALIDATE
(DIGIT)BEEP SIZE(-):MIN$ ::
IF (MIN$<"00")OR(MIN$>"59")
THEN 590 !217
600 ACCEPT AT(12,18)VALIDATE
(DIGIT)BEEP SIZE(-):SEC$ ::
IF (SEC$<"00")OR(SEC$>"59")
THEN 600 !203
610 PRINT #[:SEC$,MIN$,HR$,D
AY$,MON$,YR$ :: CLOSE #[:
DISPLAY ERASE ALL :: GOTO 16
0 !182
620 !@P+ !062
630 SUB E(H$,I$,J$,K$,L$,M$,
N$,O$):: ON ERROR 660 !158
640 OPEN #9:"CLOCK" :: INPUT
#9:D$,E$,F$ :: CLOSE #9 ::
I$=SEG$(E$,1,2):: J$=SEG$(E$,
7,2):: H$=SEG$(E$,4,2)!064
650 K$=D$ :: L$=SEG$(F$,1,2)
:: M$=SEG$(F$,4,2):: N$=SEG$(
F$,7,2):: O$=" Triple Tech
Clock Detected" :: CALL SCRE
EN(13)!046
660 SUBEND !168
670 SUB F(H$,I$,J$,K$,L$,M$,
N$,O$):: ON ERROR 700 !199
680 OPEN #9:"TIME", INTERNAL,
FIXED :: INPUT #9:N$,M$,L$,H
$,I$,J$ :: CLOSE #9 :: O$="
Myarc clock detected" !06
4
690 CALL SCREEN(5)!150
700 SUBEND !168
710 SUB G(H$,I$,J$,K$,L$,M$,
N$,O$):: ON ERROR 750 !250
720 DEF BD(X)=X-6*INT(X/16)!
247
730 CALL PEEK(-31164,A,A1,B,
B1,C,C1,D,D1,E,E1,F,F1):: K$
=STR$(BD(D)):: H$=STR$(BD(E)
):: I$=STR$(BD(F)):: L$=STR$(
BD(C)):: M$=STR$(BD(B)):: N
$=STR$(BD(A)):: O$=" MBP
Clock detected" :: J$="95"
!178
740 IF VAL(M$)<10 THEN M$="0
"&M$ !038
750 SUBEND !168
760 SUB AMPM(L$,M$,TM$)!017
770 IF VAL(L$)=0 THEN TM$="1
2:"&M$&"am" :: SUBEXIT !045
780 IF VAL(L$)=12 THEN TM$=L
$&":"&M$&"pm" :: SUBEXIT !05
1
790 IF VAL(L$)>12 THEN TM$=S
TR$(VAL(L$)-12)&":"&M$&"pm"
ELSE TM$=L$&":"&M$&"am" !048
800 SUBEND !168
810 SUB DATE(J,K,I,P$)!099
820 D$="January February
March April May
June July August
September October Nove
mber December " !194
830 P$=SEG$(D$, (J-1)*10+1,10
):: T=POS(P$," ",4):: P$=SEG
$(P$,1,T)&STR$(K)&","&STR$(
I):: SUBEND !209
840 SUB DAY(J,K,I,K$)!029
850 IF J>2 THEN M=J-2 :: Y=I
ELSE M=J+10 :: Y=I-1 !141
860 C=INT(Y/100):: D=Y-100*C
:: N=INT((13*M-1)/5)+K+D+IN
T(D/4)+INT(C/4)-C-C+77 :: N=
N-7*INT(N/7)+1 :: IF N=1 THE
N K$="Sunday" !085
870 IF N=2 THEN K$="Monday"
!157
880 IF N=3 THEN K$="Tuesday"
!022
890 IF N=4 THEN K$="Wednesda
y" !222
900 IF N=5 THEN K$="Thursday
" !142
910 IF N=6 THEN K$="Friday"
!152
920 IF N=7 THEN K$="Saturday
" !137
930 SUBEND !168

```

Reservation number changes for Fest West

Tom Wills of the South West Ninety Niners says Ramada Inn University, Tucson, Arizona, where Fest West '96 is to be held, has changed the number to call for reservations. The new number to call is 1-800-777-2999. Or, (520) 623-6666. Callers should specify the reservation is for Fest West '96, which is scheduled for Feb. 17, 1996.

For other information, call: BJ Mathis (520) 747-5046; Tom Wills (520) 886-2460; or Mike Doane (520) 98-3835. Or write Fest West 96 Committee, South-West 99ers, P.O. Box 17831, Tucson, AZ 85731-7831.

THE ART OF ASSEMBLY — PART 53

Yes You Can!

By **BRUCE HARRISON**

If there's one danger in becoming a "guru" in assembly, it's this: People are always asking me questions, and expecting that I'll know the answers. Sometimes it's easy to answer, and other times it takes whole days of experimenting with the TI to find the solution. Today we'll start with a "case in point" of a question and its answer.

Our dear friend Dr. Charles Good asked a question about our compiler. He wanted to know whether a user could make a compiled program work with additional assembly routines. At first, we thought no, and told him so. That answer turned out to be wrong, but we didn't know that for some months.

FINDING OUT

Some months after answering the question for Dr. Good, we found a need in our own work to compile a program that included the loading and use of an Assembly routine. The program was a demo for one of our Assembly routines, but we wanted to know how the program would perform when Compiled. It had been many months since we'd used the Compiler, or worked on it, so we weren't sure what it would do with a line like:

```
10 CALL INIT :: CALL LOAD("DSK1.ACCTIME/O")
```

We had a vague memory of having put a provision into the Compiler so it would simply ignore CALL INIT. That was put in because the compiled program performs a CALL INIT when it starts, and would quit working if another CALL INIT got performed while it was running. Sure enough, the Compiler did indeed ignore the CALL INIT part of line 10. It then included the rest of line 10 with a BL @TOGI instruction, so that the CALL LOAD... would be performed by the GPL interpreter. That looked as if it would work, and indeed it did! When the compiled program started running, it lit up drive 1, loaded the routine ACCTIME/O, and then went on with its job. The CALL LINKs within the program that used ACCTIME/O also worked just as they had in the original Extended BASIC program. Neat!

DON'T THANK ME!

Thank Harry Wilhelm, who designed the very clever High Memory Loader program. As you know, Harry is the guy I call on when I need help, and he almost always has a ready and correct answer. Harry designed the HML program so that things like my compiled programs could contain Assembly content without tying up any of the low memory space. Thus, when that CALL LOAD got executed, the content of the object file got placed into low memory, just as if a "normal" XB program were running. Harry also designed his HML so that, if the item needed for a CALL LINK was not found in his lookup list in high memory, it would be sought in the "normal" DEF table in low memory and executed. Thanks, again, Harry! Your genius never ceases to amaze us.

Harry Wilhelm designed the HML program so that things like my compiled programs could contain Assembly content without tying up any of the low memory space.

NOT ONLY THAT, BUT...

Having proved that this method would indeed work provided that the object file was available on the right disk, we wondered if we could take advantage of another of the features of Harry's HML. That is the ability to load more than one object file into high memory. In the usual case with the compiler, we load only the compiler's object file, but HML will allow us to add more object files to the list before loading. We decided that this was worth trying, so we removed line 10 from the original program, Compiled and assembled as usual, and then during the HML operation, we added ACC-TIME/O along with the Compiler's object file. Sure enough, HML loaded both files

into high memory, and the resulting program worked exactly as we'd hoped. Now we don't have to worry about having ACC-TIME/O on the disk, since its contents are "embedded" right inside the compiled program.

THERE ARE EXCEPTIONS!

This section could be called "NO YOU CAN'T"! There are some assembly routines that won't work with compiled program. One example that immediately comes to mind is one of our own inventions, namely the CALL FILES routine that we wrote to allow CALL FILES to be done from within an XB program. That would fail to work because the XB program gets told by the routine to RUN (line number), and the line number in all likelihood will not be there. It's possible to use the CALL FILES linkage by changing the second parameter in CALL LINK("CALLF"...) to 32767 before saving the XB program in merge format. We've tried that, and it worked on our demo program. Another clear exception is our boot-tracking routine (TRACK4), which searches for DSK1 in the XB program. That won't work because it has no way of searching through the assembly part of the compiled program. There may be other assembly routines that won't work with a compiled program, but we've no way of knowing what will and won't work unless people try things and let us know.

ANOTHER LOOK AT THINGS

As most of our readers know, from time to time we take another look at old routines that we designed and update them. In recent months, we've been playing various "games" with the concepts of User Interrupt and ways of counting time in 60ths of a second. The idea came to us that we could perhaps make a new and improved version of our screen input routine CRSIN. That was published many moons ago, and we still use it with slight variations in most of our programs. It works well, but when run on a Geneve or a bus-modified TI, the cursor blinks much too fast. Could we use the knowledge we'd gained about interrupts to cure that problem? Yes, we could!

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THE ART OF ASSEMBLY —

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THE NEW ACCEPT ROUTINE

The idea was simple enough. We'd use a USRINT to check the state of the counter at >8379, and switch from cursor to screen character after every 20/60ths of a second. In order to make this work as we wanted, we did some tricks that may appear strange at first sight. For example, we used a BLWP vector out of the USRINT that uses our own workspace for the BLWP. This was possible because the interrupt servicing happens in another workspace, so there's no need to supply another set of registers for the BLWP that changes the character on screen. In this month's sidebar is a complete program that uses ACCEPT to take input from the screen into a string in memory, then displays that string.

WHILE WE'RE AT IT ...

While making this new routine, we added some features that were not in the original. For example, the DATA following the BL@ACCEPT determines the screen position, the location in memory into which the string is reported, and whether or not the field is to be cleared upon entry. We also added an erase feature with Function-3 (or Function-8) that can clear the field while the routine is running. We kept the ideas of repeat-key action for moving the cursor left and right, with a delay before repeat starts, and used the interrupt count for that, too. Thus the delay before repeat starts and the repeat rate itself are independent of the speed of the processor.

The result is a better subroutine. It's simpler than the old one, does not require self-modifying code, and reacts faster to keystrokes. As before, Function-1 and Function-2 perform delete and insert, much the way the TI built-in line editors do, except that the delete key does not repeat. Our students may want to make some changes, and of course that's fine. You might, for example, want to make Function-E or Function-X exit from the routine, by extending the FUNCT series of labels. You might also want Function-8 to exit instead of just replicating what Function-3 does. There you go, another exercise for the serious student. At present, other Function key combinations, such as Function-4, -5, -6, or -7 have no effect. Same goes for Function-E and -X.

HOW DOES IT WORK?

You think we know! Take a look at the sidebar, which has lots of annotation, and maybe you could tell us. Just kidding! Here's how it works.

The very first thing the routine does is to get its "parameters" from the DATA following the BL. That starts with getting the desired screen position. MOV *R11+,R0 gets the desired position into R0. Since this routine is going to put an edge character just before the first input position, it will check to see if your desired position is the screen origin, and will move one byte to the right so there's room for the edge character ahead of the first character acceptance position.

Next, it gets the maximum number of characters allowed into R2, the "clear field" signal into R3, and the address for the output string into R9. The address used as the fourth parameter should have room for the number of characters allowed plus one, for the length byte. Here, we've allowed a BSS of 30 at TEMSTR, but 29 would work, since we've limited the input field to 28 characters.

Now the routine clears its insert flag, then stashes away the parameters for starting screen position and number of characters into R7 and R4, for use later. It next points back one spot on the screen and places an edge character there. This is done so we can prevent the cursor from moving outside the field. R0 gets INCed, then R2 added, and another edge character gets placed one spot beyond the last allowed input spot. We set R6 so it points to that last spot in the input field. We'll need that later, too. At CLRSNS, we get back the starting position into R0, then check R3. If R3 is zero, we won't clear the input field. If R3 is anything other than zero, we will clear the field. That's done using a simple loop, which you can easily decipher.

At this point, we're through with all the preliminaries, and ready to actually start accepting keystrokes. The first order of business, then, at label KEYFRC, is to find out what character is already there at the first position in the field. We'll save that character at ALTKEY, so it can alternate with the cursor when the blink is happening. Now we put the cursor's ASCII value (30) into the left byte of R1, and write that to the screen. To make the blinking start, we clear the counter at >8378, then enable our USRINT routine by placing its address at >83C4.

THE MAGIC PART

In the five lines starting at KEYIN, all the magic part happens. Notice that, after scanning the keyboard, we use LIM1 2 and LIM1 0 to briefly allow interrupts during each pass through this five-line loop. Because interrupts are being allowed, the timer at >8379 gets incremented once every 60th of a second, and our USRINT also executes once every 60th to check the state of that counter.

When USRINT finds that the counter is equal to or greater than 20, it will invoke the changing code by BLWP @CHVECT. That vector uses our own workspace (WS) and the code starting at CHG1. There, we read the character from the current screen position. If that's a cursor, we replace it with the character from ALTKEY. If it's not a cursor, we put the cursor at that position. Using our own workspace for this vector may seem strange, but it saves our having to set aside another workspace just for this purpose. The only drawback is that while the interrupt is active, we can't use R13, R14, and R15, since those get changed by the BLWP action.

If you'd like, you could set aside another workspace somewhere in the data section like this:

```
CHGWS BSS 32
```

Then you'd have to change CHVECT to DATA CHGWS,CHG1, and change the start of CHG1 like this:

```
CHG1 MOV @WS,R0
      BLWP @VSBR
```

The rest could stay unchanged. That would work just as well as what we've shown, and then you could keep R13, R14, and R15 of the workspace at WS available for other things. Of course most of the registers at CHGWS would go unused, but perhaps you could use them in some other vector within your program.

That's how the magic happens. The cursor blinking is carried out in the background, without needing attention from the main part of the subroutine. Just for the fun of it, we've added a part to

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the main program in the sidebar so that, after you've "accepted" a string through the routine and then displayed that, we activate the USRINT before the BL @KEYLOO near the end of the main program. Sure enough, while the program waits for a keystroke, the cursor blinks near the bottom of the screen.

THE CAUTIONS

Be a bit careful about using this idea. Notice that in some places here we've put in a CLR @>83C4. That's done to de-activate the USRINT while we're doing things like, for example, delaying for repeat-key operation. (We don't want the cursor blinking by itself during that time.) Also, we've taken care to disable USRINT before exiting back to E/A. If we forget that, the cursor will stay there blinking while the "Press Enter to Continue" message is on-screen, and even after that.

We've found that having a user interrupt activated can interfere with certain other functions, particularly if we're in the Extended BASIC environment. There, for example it messes up the action of ON BREAK NEXT, among other things. In all cases, then, you should make sure that the user interrupt is activated only while needed.

Next month, another surprise topic. We're taking some time off from writing these, so we can get other things done. One could say we're busy servicing an interrupt.

SIDEBAR 53

```

0001 * SIDEBAR 53
0002 *
0003 * A STRING INPUT FIELD USING THE USER
0004 * INTERRUPT TO CONTROL CUSOR BLINK.
0005 * A COMPLETE PROGRAM
0006 * Code by Bruce Harrison
0007 * 21 December 1994
0008 * PUBLIC DOMAIN
0009 *
0010 REF VSBW, VSBW, VMBW, VMBR, KSCAN REF UTILS
0011 DEF START DEFINE ENTRY
0012 *
0013 * REQUIRED EQUATES
0014 *
0015 STATUS EQU >837C GPL STATUS BYTE
0016 KEYADR EQU >8374 KEY-UNIT
0017 KEYVAL EQU >8375 KEY VALUE
0018 *
0019 * MAIN CODE SECTION
0020 *
0021 START LWPI WS LOAD OUR WORKSPACE
0022 CLR @KEYADR CLEAR KEY-UNIT
0023 RESTR BL @ACCEPT USE ACCEPT SUBROUTINE
0024 DATA 11*32+2 SCREEN POSITION R12, C3
0025 DATA 28 FIELD LEN
0026 DATA 0 0 - DON'T CLEAR 1 - CLEAR
FIELD
0027 DATA TEMSTR STRING DESTINATION
0028 LI R0, 13*32+2 ROW 14, COL 3
0029 LI R1, TEMSTR STRING JUST ACCEPTED
0030 BL @DISSTR DISPLAY THAT
0031 LI R0, 19*32+5 ROW 20, COL 6
0032 LI R1, PAK "PRESS ANY KEY"
0033 BL @DISSTR DISPLAY THAT

```

```

0034 A R2, R1 NEXT STRING
0035 LI R0, 21*32+4 ROW 22, COL 5
0036 BL @DISSTR DISPLAY "OR FUNCT-8"
0037 LI R0, 23*32+15 ROW 24, COL 16
0038 CLR @>8378 CLEAR TIMER
0039 MOV @CURSOR, R1 CURSOR CHAR
0040 BLWP @VSBW ON SCREEN
0041 MOV @INTLOC, @>83C4 ENABLE USER INTERRUPT
0042 MOV @ANYKEY, @ALTKEY ALTERNATE SPACE
0043 BL @KEYLOO USE KEY LOOP
0044 CLR @>83C4 STOP USRINT
0045 MOV @ANYKEY, R1 SPACE IN R1
0046 BLWP @VSBW WRITE THAT
0047 CI R8, 6 WAS FUNCTION-8 STRUCK?
0048 JEQ RESTR IF SO, GO BACK
0049 LWPI >83E0 GPL WORKSPACE
0050 B @>6A TO GPL INTERPRETER
0051 *
0052 * SUBROUTINES
0053 *
0054 ACCEPT MOV *R11+, R0 R0 HAS START POSITION
0055 JNE GETLEN IF NOT 0, JUMP
0056 INC R0 ELSE POINT AT 1
0057 GETLEN MOV *R11+, R2 R2 HAS MAX LENGTH
0058 MOV *R11+, R3 R3 HAS CLEAR FIELD SIGNAL
0059 MOV *R11+, R9 R9 HAS STRING DESTINATION
0060 CLR @INSFLG NOT IN INSERT
0061 MOV R0, R7 SAVE START POSITION
0062 MOV R2, R4 SAVE LENGTH
0063 DEC R0 POINT ONE BACK
0064 MOV @EDGE, R1 EDGE CHARACTER
0065 BLWP @VSBW WRITE A BYTE
0066 INC R0 BACK TO START
0067 A R2, R0 ADD LENGTH
0068 MOV R0, R6 SAVE THAT POSITION
0069 DEC R6 LAST ALLOWED
0070 BLWP @VSBW WRITE EDGE CHAR
0071 CLRSNS MOV R7, R0 BACK TO START
0072 MOV R3, R3 CHECK SIGNAL
0073 JEQ KEYFRC IF ZERO, JUMP
0074 MOV R4, R2 GET LENGTH BACK IN R2
0075 MOV @ANYKEY, R1 SPACE CHAR
0076 CLRFLD BLWP @VSBW WRITE ONE SPACE
0077 INC R0 MOVE AHEAD ONE
0078 DEC R2 DEC COUNT
0079 JNE CLRFLD IF NOT 0, RPT
0080 MOV R7, R0 GET START BACK
0081 *
0082 * KEYFRC GETS THE CURRENT CHARACTER
0083 * FROM THE SCREEN, FORCES THE CURSOR
0084 * TO THAT POSITION, THEN ACTIVATES THE
0085 * USER INTERRUPT TO BLINK CURSOR
0086 *
0087 KEYFRC BLWP @VSBW READ BYTE AT R0 POSITION
0088 MOV R1, @ALTKEY PLACE AT ALTKEY
0089 MOV @CURSOR, R1 PUT CURSOR IN R1
0090 BLWP @VSBW WRITE CURSOR
0091 CLR @>8378 CLEAR TIME COUNTER
0092 MOV @INTLOC, @>83C4 ENABLE USER INTERRUPT
0093 *
0094 * KEYIN IS THE PART THAT GETS KEYSTROKES
0095 *
0096 KEYIN BLWP @KSCAN SCAN KEYBOARD
0097 LIM 2 ALLOW INTERRUPTS

```

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```

0098     LIM1 0          STOP THEM
0099     CB  @STATUS,@ANYKEY KEY STRUCK?
0100     JNE  KEYIN     IF NOT, REPEAT
0101     *
0102     * FOLLOWING CODE USES THE KEYSTROKE
0103     *
0104     MOV  @KEYADR,R8  KEY AS WORD IN R8
0105     MOVB @ALTKEY,R1  OLD CHAR IN R1
0106     BLWP @VSBW      WRITE TO SCREEN
0107     CB  @KEYVAL,@ENTERV "ENTER" STRUCK?
0108     JEQ  KEYEX      IF YES, EXIT
0109     CB  @KEYVAL,@BACKUP FUNCTION-S?
0110     JNE  KEY0      IF NOT, JUMP
0111     *
0112     * FOLLOWING IS CODE THAT HANDLES FUNCTION-S
0113     * IT MOVES CURSOR ONE SPOT, THEN GOES TO
0114     * RPTKEY, WHICH DELAYS BEFORE ALLOWING REPEAT
0115     *
0116     DEC  R0          DEC SCRN POSITION
0117     BLWP @VSBR      READ BYTE
0118     CB  R1,@EDGE    EDGE CHARACTER?
0119     JNE  BCKX       IF NOT, JUMP
0120     INC  R0          ELSE INC POSITION
0121     JMP  KEYFRC     THEN BACK
0122     BCKX B  @RPTKEY  AHEAD FOR REPEAT ACTION
0123     KEY0 CB  @KEYVAL,@FWD FUNCTION-D?
0124     JNE  KEY1      IF NOT, JUMP AHEAD
0125     *
0126     * FOLLOWING IS CODE THAT HANDLES FUNCTION-D
0127     * IT MOVES CURSOR ONE SPOT, THEN GOES TO
0128     * RPTKEY, WHICH DELAYS BEFORE ALLOWING REPEAT
0129     *
0130     INC  R0          POINT AHEAD
0131     BLWP @VSBR      READ BYTE
0132     CB  R1,@EDGE    EDGE CHAR?
0133     JNE  FWKX       IF NOT, JUMP
0134     DEC  R0          ELSE POINT BACK
0135     B    @KEYFRC     THEN BRANCH BACK
0136     FWKX JMP  RPTKEY  AHEAD FOR REPEAT ACTION
0137     KEY1 CI  R8,32   COMPARE TO SPACE BAR
0138     JLT  FUNCT      IF LESS, CHECK FOR FUNCT
0139     *
0140     * FOLLOWING HANDLES KEY VALUES 32 AND ABOVE
0141     *
0142     MOV  @INSFLG,R1  INSERT MODE?
0143     JEQ  KEY1A      IF NOT, JUMP AHEAD
0144     *
0145     * FOLLOWING HANDLES INSERT IF IN INSERT MODE
0146     *
0147     C    R0,R6       AT END OF FIELD?
0148     JEQ  KEY1A      IF SO, NO INSERT
0149     MOV  R6,R2       GET LAST POSITION
0150     S    R0,R2       SUBTRACT CURRENT POSITION
0151     MOV  R9,R1       USE ASSIGNMENT SPACE
0152     BLWP @VMBR      PUT BYTES THERE
0153     INC  R0          POINT AHEAD ONE
0154     BLWP @VMBW      WRITE THERE
0155     DEC0 DEC  R0     BACK TO OLD POSITION
0156     JMP  KEY1A      PUT IN THE KEYSTROKE
0157     *
0158     * FOLLOWING HANDLES FUNCTION KEYS WITH VALUES BE-
LOW 32
0159     *
0160     FUNCT CB  @KEYVAL,@DELKEY DELETE KEY?
0161     JNE  FUNCT2     IF NOT, JUMP
0162     *
0163     * FOLLOWING HANDLES DELETE WITH FUNCTION-1
0164     *
0165     MOV  R0,R3       STASH AWAY R0
0166     MOV  R6,R2       GET END OF FIELD
0167     S    R0,R2       SUBTRACT CURRENT POSITION
0168     JEQ  NULDEL     IF ZERO, JUMP AHEAD
0169     INC  R0          ELSE POINT AHEAD ONE
0170     MOV  R9,R1       POINT AT ASSIGNMENT PLACE
0171     BLWP @VMBR      READ TO THERE
0172     DEC  R0          POINT BACK ONE
0173     BLWP @VMBW      WRITE TO THERE
0174     NULDEL MOV  R6,R0  GET END OF FIELD
0175     MOVB @ANYKEY,R1  SPACE CHAR
0176     BLWP @VSBW      WRITE A SPACE
0177     MOV  R3,R0       GET OLD POSITION BACK
0178     JMP  KEYFRC     JUMP TO GET NEXT KEY
0179     FUNCT2 CB  @KEYVAL,@INSKEY FUNCT-2 PRESSED?
0180     JNE  FUNCT3     IF NOT, JUMP
0181     *
0182     * FOLLOWING SETS INSERT MODE ON FUNCTION-2
0183     *
0184     INC  @INSFLG     SET INSERT FLAG
0185     JMP  KEYFRC     THEN BACK
0186     FUNCT3 CB  @KEYVAL,@ERSKEY FUNCT-3 PRESSED?
0187     JNE  FUNCT9     IF NOT, JUMP
0188     *
0189     * FOLLOWING ERASES FIELD IF FUNCTION-3 STRUCK
0190     *
0191     ERSFLD MOVB @ANYKEY,R3  SET R3 NON-ZERO
0192     B    @CLRNSNS    BRANCH TO CLEAR FIELD
0193     *
0194     * FUNCTION-9 EXITS FROM ROUTINE
0195     *
0196     FUNCT9 CI  R8,15  FUNCTION-9?
0197     JEQ  KEYEX      IF SO, EXIT ROUTINE
0198     *
0199     * FUNCTION-8 CAUSES ERASE OF FIELD
0200     *
0201     CI  R8,6        FUNCTION-8?
0202     JEQ  ERSFLD     IF SO, ERASE
0203     B    @KEYFRC     ELSE IGNORE KEYSTROKE
0204     *
0205     * FOLLOWING PUTS CURRENT KEYSTROKE ON SCREEN
0206     * THEN MOVES CURSOR TO NEXT SPOT
0207     *
0208     KEY1A MOVB @KEYVAL,R1  GET KEY VALUE IN R1
0209     BLWP @VSBW      WRITE THAT
0210     INC  R0          POINT AHEAD
0211     BLWP @VSBR      READ A BYTE
0212     CB  R1,@EDGE    EDGE?
0213     JNE  KEY1X      IF NOT, OKAY
0214     DEC  R0          POINT BACK
0215     KEY1X B    @KEYFRC  THEN BRANCH BACK
0216     *
0217     * KEYEX IS THE EXIT FROM THIS ROUTINE
0218     *
0219     KEYEX CLR  @>83C4    KILL USER INTERRUPT
0220     MOV  R4,R2       GET LENGTH
0221     MOV  R6,R0       AND LAST POSITION
0222     RDBYT BLWP @VSBR  READ A BYTE
0223     CB  R1,@ANYKEY  SPACE?
0224     JNE  RDSTR      IF NOT, JUMP

```

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```

0225      DEC R0          ELSE DEC POSITION
0226      DEC R2          AND CHAR COUNT
0227      JNE RDBYT      IF NOT ZERO, GO BACK
0228 RDSTR  MOV R9,R1    GET STRING LOCATION
0229      MOV R7,R0      AND START POSITION
0230      SWPB R2        SWAP BYTES
0231      MOVB R2,*R1+  PUT LENGTH BYTE AT STRING
LOCATION
0232      JEQ NULSTR     IF ZERO, JUMP
0233      SWPB R2        SWAP R2 AGAIN
0234      BLWP @VMBR     READ STRING CONTENT
0235 NULSTR RT          RETURN TO CALLER
0236 *
0237 * UPON EXIT, THE ENTRY IS PLACED AS A STRING WHERE
ASSIGNED,
0238 * AND REGISTER 8 HAS THE KEYSTROKE THAT CAUSED
THE EXIT
0239 *
0240 *
0241 * FOLLOWING IS THE REPEAT-KEY FUNCTION FOR LEFT
AND RIGHT
0242 * MOVEMENT OF THE CURSOR
0243 *
0244 RPTKEY BLWP @VSBR    READ CURRENT CHAR
0245      MOVB R1,@ALTKEY  PLACE AT ALTKEY
0246      MOVB @CURSOR,R1 GET CURSOR
0247      BLWP @VSBW      WRITE THAT
0248      CLR @INSFLG     CLEAR INSERT MODE
0249      CLR @>8378     CLEAR TIMER
0250      CLR @>83C4     DISABLE USRINT
0251 *
0252 * THE LOOP STARTING AT RPT1 DELAYS REPEAT MOTION
FOR
0253 * 32/60THS OF A SECOND UNLESS KEY IS RELEASED
0254 *
0255 RPT1   BLWP @KSCAN    SCAN KEYBOARD
0256      LIM1 2          ALLOW INTS
0257      LIM1 0          STOP INTS
0258      CB @KEYVAL,@NOKEY NO KEY?
0259      JEQ RPTEX      IF SO, EXIT
0260      CB @>8379,@ANYKEY COMPARE TO 32
0261      JLT RPT1       IF LESS, JUMP
0262 RPT1A  CLR @>8378    CLEAR TIMER
0263      MOVB @ALTKEY,R1 GET ALTKEY BACK
0264      BLWP @VSBW      WRITE
0265      CB @KEYVAL,@BACKUP BACKWARD?
0266      JNE RPTF       IF NOT, JUMP
0267      DEC R0          ELSE BACK ONE
0268      BLWP @VSBR     READ CHAR
0269      CB R1,@EDGE    IS THAT EDGE CHAR?
0270      JNE RPTF1     IF NOT, JUMP
0271      INC R0          PUT POSITION BACK
0272      JMP RPTEX      THEN EXIT
0273 RPTF   INC R0        AHEAD ONE
0274 RPTF1  BLWP @VSBR    READ CHAR
0275      CB R1,@EDGE    EDGE?
0276      JNE RPTFA     IF NOT, JUMP
0277      DEC R0          BACK ONE
0278      JMP RPTEX      THEN EXIT
0279 RPTFA  MOVB R1,@ALTKEY STASH CURRENT CHAR
0280      MOVB @CURSOR,R1 CURSOR IN R1
0281      BLWP @VSBW      WRITE CURSOR
0282 *
0283 * THE LOOP AT RPT2 DELAYS 8/60THS UNLESS KEY IS
RELEASED
0284 *
0285 RPT2   BLWP @KSCAN    SCAN KEYBOARD
0286      LIM1 2          INTS ON
0287      LIM1 0          THEN OFF
0288      CB @KEYVAL,@NOKEY NO KEY?
0289      JEQ RPTEX      IF SO, EXIT
0290      CB @>8379,@BACKUP COMPARE TO 8
0291      JLT RPT2       IF LESS, REPEAT
0292 *
0293 * AFTER 8/60THS, CURSOR ADVANCES ANOTHER STEP
0294 *
0295      JMP RPT1A       ELSE JUMP BACK
0296 RPTEX  MOVB @ALTKEY,R1 OLD CHAR
0297      BLWP @VSBW      WRITE THAT
0298      B @KEYFRC      THEN BRANCH BACK
0299 *
0300 * FOLLOWING IS THE "BLINK", DONE WITH USER INTER-
RUPT
0301 * EVERY 20 60THS, THIS WILL BLWP @CHVECT TO
CHANGE
0302 * FROM CURSOR TO CHARACTER OR VICE VERSA
0303 *
0304 USRINT CB @>8379,@TWENTY TIMER=20?
0305      JLT INTEX      IF LESS, EXIT
0306      BLWP @CHVECT  ELSE CHANGE CHAR
0307 INTEX  RT          RETURN TO INTERRUPT HAN-
DLER
0308 *
0309 * CHVECT CHANGES FROM CURSOR TO CHAR AND VICE
VERSA
0310 * EVERY 20/60THS OF A SECOND. (THAT'S 1/3 SEC-
OND)
0311 *
0312 CHVECT DATA WS,CHG1  OUR OWN WORKSPACE, CHANGE
CODE
0313 CHG1  BLWP @VSBR    READ CURRENT BYTE FROM
SCREEN
0314      CB R1,@CURSOR  IS THAT CURSOR?
0315      JEQ CHG2       IF YES, JUMP
0316      MOVB @CURSOR,R1 ELSE GET CURSOR
0317      BLWP @VSBW      AND WRITE THAT
0318      JMP CHGX       THEN EXIT
0319 CHG2  MOVB @ALTKEY,R1 PUT OLD CHAR IN R1
0320      BLWP @VSBW      WRITE THAT
0321 CHGX  CLR @>8378    CLEAR TIMER
0322      RTWP          THEN RETURN
0323 *
0324 * DISSTR DISPLAYS A STRING ON SCREEN
0325 *
0326 DISSTR MOVB *R1+,R2   GET LENGTH BYTE
0327      SRL R2,8       RIGHT JUSTIFY
0328      JEQ DISX      IF ZERO, EXIT
0329      BLWP @VMBW     ELSE WRITE STRING
0330 DISX  RT          RETURN
0331 *
0332 * KEYLOO WAITS FOR A KEYSTROKE, THEN RETURNS
0333 * IN THIS INSTANCE, WE'VE MADE THE CURSOR BLINK
0334 * WHILE KEYLOO IS EXECUTING.
0335 *
0336 KEYLOO BLWP @KSCAN    SCAN KEYBOARD
0337      LIM1 2          ALLOW INTS
0338      LIM1 0          THEN STOP
0339      CB @STATUS,@ANYKEY ANY KEY?
0340      JNE KEYLOO     IF NOT, REPEAT
0341      MOV @KEYADR,R8  KEY AS WORD INTO R8

```

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```

0343 *
0344 * DATA SECTION
0345 *
0346 WS BSS 32 OUR WORKSPACE
0347 INTLOC DATA USRINT USER INTERRUPT ADDRESS
0348 INSFLG DATA 0 INSERT FLAG
0349 DELKEY BYTE 3 FUNCTION-1 VALUE
0350 INSKEY BYTE 4 FUNCTION-2 VALUE
0351 ERSKEY BYTE 7 FUNCTION-3 VALUE
0352 TEMSTR BSS 30 TEMPORARY STRING
0353 ALTKEY BYTE 0 CURRENT CHARACTER FROM

```

```

SCREEN
0354 ENTERV BYTE 13 ENTER KEY VALUE
0355 CURSOR BYTE 30 CURSOR CHAR
0356 BACKUP BYTE 8 FUNCTION-S
0357 FWARD BYTE 9 FUNCTION-D
0358 ANYKEY BYTE 32 SPACE OR COMPARISON BYTE
0359 TWENTY BYTE 20 CURSOR BLINK NUMBER
0360 NOKEY BYTE >FF NO KEY INDICATION
0361 EDGE BYTE 31 EDGE CHAR
0362 PAK BYTE 21
0363 TEXT 'PRESS ANY KEY TO EXIT'
0364 OR8 BYTE 23
0365 TEXT 'OR FUNCTION-8 TO REPEAT'
0366 END

```

The meaning of Funnelweb

Use this listing to decide which files to keep, which to discard

By CHARLES GOOD
Lima Ohio User Group

Listed below are the Funnelweb files on the Lima Ohio User Group's two three-disk sets of complete 40- and 80-column Funnelweb. Next to each file is Charles Good's DSKU comment detailing the function of that particular file. These are all the current files from versions 4.4 and 5.01 for 40-columns and from v4.4 and v5.21 for 80-columns. Any of the original v4.4 files not listed below are now obsolete.

Any user can obtain either or both of these 3 disk sets by sending a paid return mailer to me at P.O. Box 647, Venedocia, OH 45894.

Readers with Funnelweb can use this catalog of files to decide what to eliminate from their working Funnelweb disks. It is of special value to those who run Funnelweb from a RAMdisk with limited memory. Some of the files listed here are available only on Funnelweb copies distributed by the Lima user group.

40-Column Files Disk 1 of 3. Main system files.

Filename	TYPE	Comment
AS	PGM	Assembly code ASSEMBLER part 1
AT	PGM	Assembly code ASSEMBLER part 2
C1	PGM	Char set for use by central menus
C2	PGM	Another char set for central menus
CF	PGM	Configures all funnelweb but editor
CG	PGM	Part 2 of funnelweb config program
(NOTE: 8-bit char sets have All Chars graphics.)		
CHAR@1	PGM	USA 8-bit IBM graphics char set
CHAR@2	PGM	British 8-bit IBM graphics char set
CHAR@3	PGM	French 8-bit IBM graphics char set
CHAR@4	PGM	German 8-bit IBM graphics char set
CHAR@5	PGM	Italian 8-bit IBM graphics char set
CHAR@6	PGM	Swedish 8-bit IBM graphics char set
CHAR@7	PGM	Dutch 8-bit IBM graphics char set
CHAR@8	PGM	Spanish 8-bit IBM graphics char set
(NOTE: These 7-bit char sets used in Eurowriter mode)		
CHARA1	PGM	British 7-bit national char set
CHARB1	PGM	French 7-bit national char set
CHARC1	PGM	German 7 bit national char set
CHARD1	PGM	Italian 7-bit national char set
CHARE1	PGM	Swedish 7-bit national char set

CHARF1	PGM	Dutch 7-bit national char set
CHARG1	PGM	No Spanish national 7-bit char set
CONFIG/40	D/V	Expanded editor config data file
D1	PGM	"Disk Utilities" user list
DR	PGM	40-column Disk Review part 1
DS	PGM	40-column Disk Review part 2
EA	PGM	Needed on disk for FQW loaders work
ED	PGM	8-bit v5.01 40-column editor part 1
ee	PGM	8-bit v5.01 40-column editor part 2
F4TXAE	PGM	British 40-column editor command line
F4TXBE	PGM	French 40-col editor command line
F4TXCE	PGM	German 40-col editor command line
F4TXDE	PGM	Italian 40-col editor command line
F4TXEE	PGM	Swedish 40-col editor command line
F4TXEF	PGM	Dutch 40-col editor command line
FO	PGM	Text formatter part 1
FP	PGM	Text formatter part 2
FW	PGM	MAIN FW PROGRAM FILE boots as EA5
HELP4A	PGM	40-col help screen
HELP4B	PGM	40-col help screen
HELP4C	PGM	40-col help screen
HELP4D	PGM	40-col help screen
HELP4E	PGM	40-col editor help screen
HELP4F	PGM	40-col editor help screen
HELP4G	PGM	40-col editor help screen
HELP4H	PGM	40-col editor help screen
HELP4I	PGM	40-col editor help screen
HELP4J	PGM	40-col editor help screen
INSTALL/ED	PGM	40-col editor config software
LL	PGM	LOW LOADER needed to boot LL files
LOAD	PGM	MAIN FW PROGRAM FILE boots from XB
ML	PGM	40-column MULTI LIST user list
QD	PGM	QUICK DIRECTORY used with formatter
QF	PGM	part 2 of QUICK DIRECTORY
SL	PGM	Needed to boot script load files
SYSCON	PGM	CF/CG configuration data file
UL	PGM	Central menu "User List"

40-column files. Disk 2 of 3. Other system files docs.

Filename	TYPE	Comment
-READ-ME	D/V	General v4.4 overview doc

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THE MEANING OF FUNNELWEB —

(Continued from Page 17)

4*4REVIEW	D/V	C. Good's review of v4.4
4PRINTFILE	D/V	Sample source for editor help file
5-01REVIEW	D/V	C Good's review of v5.01 editor
5-0REVIEW	D/V	C Good's review of v5.0 editor
AR	PGM	Archiver v3.03
C99PF1;O	D/F	Used with C99 from within funnelweb
CHARA1	PGM	Char set for use with DSKU
CHARUTIL	PGM	Converts custom chars to 8-bit set
CHRCOAL/S	D/V	Char set source code sample
CON/ED	D/V	Condensed editor config data file
CP	PGM	Boots c99 & returns to funnelweb
CT8K/O	D/Y	Boots Funnelweb from supercart
DU	PGM	Birdwell's DSRU v4.2 part 1
DV	PGM	DSKU v4.2 part 2
DW	PGM	DSKU v4.2 part 3
ED-BASIC	PGM	Basic 7-bit 40-col editor part 1
EE-BASIC	PGM	Basic 7-bit v5.01 40-col editor pt2
FSAVE	D/F	SAVE utility to make EA5 programs
FWDOC/EASM	D/V	PROGRAM EDITOR doc
FWDOC/LOAD	D/V	The XB LOAD doc
FWDOC/REPT	D/V	Bug and update report of FW & LOAD
HELPMMAKE40	PGM	Turns DV80 source into 40col ed help
LDFW	D/F	Boots FW from Minimem or EA module
MG	PGM	DM1000 v3.5 part 1 of 2
MH	PGM	DM1000 v3.5 part 2 of 2
SCRIPT	D/V	Sample SL file
XB4THLD	PGM	Boots TI Forth from XB menu

40-column files. Disk 3 of 3. Documentation files.

Filename	TYPE	Comment
FWDOC/DR40	D/V	40-col Disk Review doc part 1
FWDOC/DR41	D/V	40-col Disk Review doc part 2
FWDOC/EASM	D/V	PROGRAM EDITOR doc
FWDOC/ED40	D/V	v5.01 40-col editor doc part 1
FWDOC/ED41	D/V	v5.01 40-col editor doc part 2
FWDOC/ED42	D/V	v5.01 40-col editor doc part 3
FWDOC/PSRV	D/V	Assembly links to FW doc
FWDOC/SCLL	D/V	SL, UL, LL, and ML 40/80 doc
FWDOC/UTIL	D/V	CF, CP, FSAVE, LDFW, UL, LH, CT80R/O doc

80-column system. Disk 1 of 3. Main system files.

Filename	TYPE	Comment
AS	PGM	Assembly code ASSEMBLER part 1
AT	PGM	Assembly code ASSEMBLER part 2
C1	PGM	Char set for use by central menus
C2	PGM	Another char set for central menu
CF	PGM	Configures all funnelweb except editor
CG	PGM	part 2 of FW config program

(NOTE: The 8-bit char sets have IBM graphics.)

CHAR@1	PGM	USA 8-bit IBM graphics char set
CHAR@2	PGM	British 8-bit IBM graphics char set
CHAR@3	PGM	French 8-bit IBM graphics char set
CHAR@4	PGM	German 8-bit IBM graphics char set
CHAR@5	PGM	Italian 8-bit IBM graphics char set
CHAR@6	PGM	Swedish 8-bit IBM graphics char set
CHAR@7	PGM	Dutch 8-bit IBM graphics char set
CHAR@8	PGM	Spanish 8-bit IBM graphics char set

(NOTE: 7-bit char sets are for Eurowriter mode.)

CHARA1	PGM	USA 7-bit char set
CHARB1	PGM	British 7-bit national char set
CHARC1	PGM	French 7-bit national char set

CHARD1	PGM	German 7-bit national char set
CHARE1	PGM	Swedish 7-bit national char set
CHARF1	PGM	Dutch 7-bit national char set
CHARG1	PGM	Spanish 7-bit national char set
DR	PGM	80-column Disk Review part 1
DS	PGM	80-column Disk Review part 2
EA	PGM	Needed on disk for FW loaders work
ED	PGM	v5.21 80-column editor, part 1
EE	PGM	v5.21 80-column editor, part 2
EF	PGM	v5.21 80-column editor, part 3
F8TXBE	PGM	French command line for v5.21 editor
F8TXCE	PGM	German command line for v5.21 editor
F8TXEE	PGM	Swedish command line for 5.21 editor
FO	PGM	Text formatter, part 1
FP	PGM	Text formatter, part 2
FW	PGM	MAIN FW PROGRAM FILE, boots as EA5
HELP8P	D/V	Program editor help file for v5.21
HELP8W	D/V	Text editor help file for v5.21
LOAD	PGM	MAIN FW PROGRAM FILE, boots from XB
ML	PGM	80-column MULTI LIST user list
QD	PGM	QUICK DIRECTORY use with formatter
QF	PGM	QUICK DIRECTORY part 2
SYSCON	PGM	CF/CG CONFIGURATION data file
UL	PGM	Central menu "User List"

80-column system. Disk 2 of 3. Other system files, editor docs.

Filename	TYPE	Comment
5-01REVIEW	D/V	C Good's review of v5.01 editor
AR	PGM	No Archiver v3.03
C99PF1;O	D/F	Used with C99 from within FW
CHARA1	PGM	Char set for use with DSKU
CON/ED	D/F	Short version of CONFIG/ED
CONFIG/ED	D/V	Config data/use with INSTALL80
CP	PGM	Boots c99 and returns to FW
CT8K/O	D/F	Boots FW from supercart
DU	PGM	DSKU v4.2 part 1
DV	PGM	DSKU v4.2 part 2
DW	PGM	DSKU v4.2 part 3
FSAVE	D/F	SAVE utility to make EA5 programs
FWDOC/E128	D/V	Doc for v5.21 80-col editor
INSTALL80	PGM	Configures v5.21 80-col editor
LDFW	D/F	Boots FW from Minimem or EA module
LH	PGM	LINE HUNTER assembly utility
LL	PGM	LOW LOADER, needed to boot LL files
MG	PGM	DM1000 v3.5 Part 1
MH	PGM	DM1000 v3.5 Part 2
SCRIPT	D/V	Sample SL file
SL	PGM	Needed to boot script load files
XB4THLD	PGM	Boots TI FORTH from XB menu

80-column system. Disk 3 of 3. Documentation.

Filename	TYPE	Comment
-READ-ME	D/V	General v4.4 overview doc
4*4REVIEW	D/V	C Good review of v4.4
FWDOC/DR80	D/V	80-COLUMN DISK REVIEW doc
FWDOC/DR81	D/V	80-COLUMN DISK REVIEW doc
FWDOC/DR82	D/V	80-COLUMN DISK REVIEW doc
FWDOC/EASM	D/V	Editor/Assembler doc
FWDOC/LOAD	D/V	The XB LOAD menu doc
FWDOC/PRSV	D/V	Assembly links to FW doc
FWDOC/REPT	D/V	Bug and update report of FW & load
FWDOC/SCLL	D/V	SL, UL, LL, and ML40/80 doc
FWDOC/UTIL	D/V	CF, CP, FSAVE, LDFW, UL, LH, CT8K/O doc

The 1980s Home Computer Era — Part 5



Newsbytes and milestones

By BILL GASKILL
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Following is a collection of newsbytes and milestones gathered from various sources pertaining to the 1980's Home Computer Era. They are chosen at my discretion and have no particular rhyme or reason other than to show, in retrospect, the evolution and eventual death of an era.

• **TEEN KILLED BY VIDEO GAME** — “Shocked players at the Calumet IL video center were stunned as they watched the 18-year-old youth suddenly slump at the controls of (Atari's) ‘Berserk’ and slowly crumple to the ground. His lifeless body was a tragic symbol of the video game's conquest over its human foe.” (*Weekly World News*, Jun. 1982, p.1)

• “He could see the beads of sweat reflected in the TV screen as his clammy hand reached for another quarter. Finally, after spending \$85 he was within striking distance of his goal — a free game” (*Compute!*, Oct. 1982, p. 16).

• “Those who draw a distinction between Education and Entertainment don't know the first thing about either.” (Marshall McLuhan)

• **A NEW ATARI PRESIDENT** — “Roger Badertscher, who resigned as president of Atari, Inc. Home Computer Division in June, has been replaced. Ray Kassar, chairman and CEO of Atari, has announced the appointment of John Cavalier. Mr. Cavalier was previously vice-president and general manager of the Dixie-Dixie/Marathon unit of American Can Company.” (Robert C. Lock, *Compute*, Oct. 1982, p.6)

• **PAC-MAN** — “You see, Pac-Man was more than just a hugely successful video game that managed to gobble more money in 1981 than the entire Hollywood film industry combined. Pac-Man also turned out to be an equal opportunity employer” (meaning females were as attracted to the game as males). (*Compute!*, October 1982, p. 25).

• **WILL THE PRICE WARS CONTINUE?** — “Texas Instruments announced a \$100 rebate program on the TI99/4A, thereby bringing its price to \$199. We must confess that we were never aware that TI had moved to \$299, but this was apparently the case. The stock market welcomed all of this news enthusiastically, promptly lowering the price of stock in TI, Commodore, Warner Communications (Atari), and Tandy.

“The recent market rally seems to have helped though, and the group is climbing back. Atari has announced a software coupon savings offer on the 400, and Commodore has moved to lower prices on the VIC-20. Predictably, Commodore has slowed down the introduction of its \$179 Max machine, moving instead to dramatically increased VIC production. Their 40,000 units per month will be increased to 70,000 by late fall.” (Robert C. Lock, *Com-*

‘Those who draw a distinction between education and entertainment don't know the first thing about either.’

Marshall McLuhan

pute!, Oct. 1982, p. 6)

• **THE OFFICIAL ZAXXON BY SEGA** — “Zaxxon is the one game you must see to believe....Available in January on Atari, February on Apple and Radio Shack Color, and April on TI99/4A and NEC 6000.” (*Compute!*, Feb. 1983, p. 37).

• **EDITOR'S NOTES** — “1983 will be more than a shakeout year in the personal computer hardware market. It will be a finalizing year in many ways, a year in which substantial allocations of resources are committed by industry giants to tie down their stake in the personal computer marketplace. We hope that the spirit of entrepreneurial independence and innovation continues to flourish and energize our industry.” (Robert C. Lock, *Compute!*, Mar

1983, p. 6)

• **EDITOR'S NOTES** — “The industry price blitz continues with VIC recently advertised at K-Mart for \$139, Atari 400 falling below \$200, and the Commodore 64 beginning to approach the \$400 price point.

“It will be interesting to see the effect of Atari's recently announced computer/keyboard upgrade for the Atari 2600 video game machine. While the price of the unit is expected to be around \$90 (we expect to see the VIC-20 to be less than \$100 soon), the Atari unit does, undeniably, have an installed base of millions of potential game machines.” (Robert C. Lock, *Compute!*, April 1983, p. 6).

• **EDITOR'S NOTES** — “Rumor has it that we'll see Atari introducing a revised and expanded version of the 1200, with more features. Looks aren't everything. The recent move by Texas Instruments to lock up the cartridge 'marketing market would seem to pose at least one clear danger. Rather than locking up the market, they may simply have it all to themselves. TI has refused to license the rights to their graphics ROM (GROM), and thus is the only manufacturer capable of producing TI cartridges. We suspect that smaller vendors may choose to support other computers rather than attempt to resolve the maze of dealing directly with TI. On the other hand, they do have a far more effective marketing reach than independent vendors usually do.” (Robert C. Lock, *Compute!*, May 1983, p. 8).

An interesting side note to this classic example of TI's arrogance in marketing the 99/4A — Nintendo and Sega, the world's largest producers of cartridge programs for their game machines, do exactly what TI did in 1983. No one but Nintendo can manufacture a Nintendo cartridge and no one but Sega can manufacture a Sega cartridge. No one even blinks an eye at the idea today, but in 1983 it was just one more nail in the lid of the 99/4A coffin.

• **EDITOR'S NOTES** — “The latest round of price cutting has
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reached a level defying the most aggressive predictions. Prices have dropped so fast that Texas Instruments was caught while delaying the planned introduction of the TI-99/2. By the time the /2 series was scheduled to be introduced at \$99, market moves had brought the price of the /4 down to \$99. The Atari 1200, recently announced at the \$1000 level, has rapidly dropped to the \$600-700 range; the 400 is now below \$150. And then there's Commodore, with the VIC-20 below \$90 in many areas, and the 64 at \$399, or \$299, if you're able to take advantage of the trade-in offer (where you trade in your old computer or video game computer and receive a \$100 rebate). (*Compute!*, June 1983, p. 6).

• **EDITOR'S NOTES** — "Will the surge of intelligent keyboards for game machines have a massive impact on personal computer sales? We think not. With Atari, Commodore, and TI battling it out in the price trenches, we expect to see the less than \$100 market begin to expand in the features area. Principal change: more memory at less cost. And we'll just keep growing from there." (Robert C. Lock, *Compute!*, July 1983, p. 6).

• **EDITOR'S NOTES** — "The recent TI announcement of a pending second quarter loss in the \$100 million range sent shock waves through the consumer computer end of the stock market. In two days, TI stock dropped almost 50 points before beginning a gradual upturn. What's happening out there in the trenches of this economic warfare?"

"It would seem that Commodore is remaining profitable by constantly refining, redesigning, and maintaining rigorous internal cost controls. Various manufacturers, including TI, have been pulled into the trap of selling computers at loss leader prices. The expectation (perhaps more accurately the fervent hope) then becomes that money will be made on the software. With so much competition for software dollars only time will tell, but Commodore's recent and aggressive software price cuts don't bode well for the loss leader philosophy." (Robert C. Lock, *Compute!*, August 1983, p. 6).

• **EDITOR'S NOTES** — "Atari and Texas Instruments have both recently announced major revampings of the management teams responsible for their personal computer operations. Atari seems to be backing away from the \$100-\$200 price area and concentrating on building a family of systems which begins in the middle range. TI, on the other hand, appears committed to continuing to take on Commodore at the low end. A recent *Time Magazine* article indicates that IBM has now developed a 21 percent market share around the PC system." (Robert C. Lock, *Compute!*, September 1983, p.6).

• **EDITOR'S NOTES** — "Texas Instruments (too little, too late) is, for the first time in the history of their home computer division, selling every computer dealers can get their hands on, as fast as they can get their hands on them. Unfortunately, since TI doesn't make TIs anymore, this phenomenon will soon be over. It's a bargain at \$49.95." (Robert C. Lock, *Compute!*, January 1984).

• **THE YEAR AHEAD** — "We've decided to make some fearless predictions for 1984. 1983 was to be the year of the home computer, and though we feel great progress was made, we're not

convinced it's happened yet. We'll give '83 half credit, and project the rest into 1984. First the wrap-up. This past year saw Atari fall from its position of shared leadership to become a more distant runner-up; Texas Instruments withdrew completely from the highly competitive low-end computer scene; Coleco, in great fanfare, launched and stumbled, all at the same time; Commodore greatly increased market share in the midst of controversial quality assurance and delivery problems; and Apple continued to do an excellent job of completely ignoring the low-end market. IBM came through just in time with PCjr to make all the rumor mongers honest, at least if you're willing to wait for delivery.

"On this note, the fearless forecast... PCjr's won't really be available in quantity until April or May. Coleco's Adam will be redesigned and substantially modified by June, with additional price increases required. Texas Instruments will reconsider its decision to cease production of the 99. PCjr will soon have an optional keyboard with a 'standard' key set. By year end, we'll have at least one system that's 16-bit, 128K RAM, with extended color, sound and graphics capabilities for less than \$500. Commodore will have the low-end market to itself until one or two Japanese firms begin to duplicate Commodore's success and the price wars will begin again. Apple will continue to successfully ignore the low-end market. At least one company will introduce a PCjr look-alike for half the price." (Robert C. Lock, *Compute!*, Feb. 1984, p. 6).

• **EDITOR'S NOTES** — *Compute!* Editor Tom R. Halfhill "...I was assigned to another new project — *Compute!*'s PCjr magazine. The new IBM PCjr was arriving on the market and it seemed destined to become the success story of 1984. As you probably know by now, things didn't quite work out that way. The PCjr didn't sell, so neither did our new magazine. We decided to stop publication with the October 1984 issue." (Robert C. Lock, *Compute!*, Oct. 1984, p.6)

• **EDITOR'S NOTES** — "We attended our first Winter Consumer Electronic Show in January 1980. There we introduced our then-new magazine, *Compute!* Commodore was an exhibitor at that show, with quite a large booth exhibiting their product mainstream: watches. In the very back of their booth, relegated to lesser positioning so as not to interfere with the real business of the company, was a display with a couple of Commodore computers.

"We were a very timid industry then, and there was very little in the way of activity for computer watchers at that show. Off in a separate hall, a company called Automated Simulations was demonstrating some of its software. — it's the only software vendor we recall seeing then. Automated Simulations, for those of you who don't recall, is now Epyx. The intervening years have brought us great looming booths and displays from Commodore and Atari. We've also seen quite a bit of coming on strong and going away quietly: the massive personal computing extravaganzas of Texas Instruments, and Sinclair, and Acorn, and Ohio Scientific, and many, many others." (Robert C. Lock, *Compute!*, Jan 1987, p. 6).

• **MICROSOFT DELAYS WINDOWS TO MID-1985** — "Microsoft announced in October that its Windows multitasking (See Page 21)

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graphics operating environment would be delayed until at least June 1985. Windows was originally announced in November 1983 and had been scheduled for release next month to manufacturers, who were to customize it for their machines." (*Byte*, Dec. 1984, p. 9)

• **THE NEW BRITISH MANUFACTURING ALGORITHM** — One of the more humorous pieces of programming I've ever seen, it is the work of Dick Pountain, who is/was a writer and computer consultant in London, England. The code pokes fun at the British penchant for vaporware.

```
PROC New Home Computer IS
  Announce Product
  Announce Delivery Date
  Collect Customer's Money
  IF sufficient interest THEN /* pun intended */
    Design Product
    Manufacture Prototypes
  REPEAT
    Ship to Customers
    Record Complaints
    Fix Bugs
  UNTIL it works
  Sell it to K-Mart
  ELSE file for bankruptcy
ENDIF
END PROC
```

• **A NEW KIND OF PIRACY** — "The word FONT was virtually unknown to the microcomputer community until the Apple Macintosh made it de rigueur." (John C. Dvorak, *Infoworld*, Feb. 25, 1985, p. 72)

• **THE ATARI TEN COMMANDMENTS-#3** - "We shall create a computer that sets a new standard for speed and performance." (Jack Tramiel)

• **REVIEW FEEDBACK** — "The Tandy 1000 is not at all IBM PC compatible and is undoubtedly the worst supported computer in its price class." (Ken Barbier, in a letter to *Byte*, from the Nov. 1985 issue, p. 367)

• **I THOUGHT PC MEANT PERSONAL COMPUTER** — Political correctness strikes the computer world when *Byte Magazine* dares to show five (5) cartoon type characters on the cover of its May 1984 issue and they are all white males! (gasp) Reader Carol J. Buechler of Kettering, Ohio, scolds the *Byte* crew with the following letter which made it into the October 1984 issue of *Byte*.

"Regarding your May issue on computers and the professions — your cover artwork makes me wonder. Are there no women Judges? Are there no women doctors/Scientists? Are there no women contractors in construction? Are there no women surveyors? Are there no women professional types? (For the word 'women' you can also substitute 'black,' 'handicapped,' or any minority. (I am a white female.) In other words, are all professionals white male, storybook characters?"

Although *Byte's* own 115-person staff (at the time) contained 6 females, they make the decision to crumble under Buechler's charge of heresy and state "Clearly we goofed, and we apologize."

Although Buechler has a right to her opinion, so *Byte* magazine has the right to choose what they print/publish in their magazine.

'The word FONT was virtually unknown to the microcomputer community until the Apple Macintosh made it de rigueur.'

John C. Dvorak

To show such a lack of editorial guts makes me wonder how they are still in print today. If you look at the cover of the May 1984 issue of *Byte* you will see yet another example of the awesome artwork of Robert Tinney, who had been doing *Byte* cover art for years. All of a sudden his work requires an apology? I don't think so!

• **MICROSCOPE** — "Apple's introduction of the IIGS, an impressive 16-bit machine that competes with the Atari ST and Amiga while maintaining compatibility with current Apple software, may give new meaning to the 'Apple II forever' slogan. (Sheldon Leemon, *Compute!*, Dec. 1986, p. 93.)

• **COMPUTE! SPECIFIC**—"Forecasts of impending doom for the (Atari) ST are exaggerated. In fact, several auxiliary hardware developers are showing confidence in the machine by releasing products that make the ST even more powerful and versatile." (David Plotkin, *Compute!*, Sept. 1988, p. 52)

• **ATTENTION: THE AMIGA ISN'T DEAD** — "When Amiga computer maker Commodore International Ltd. faded into history earlier this year, the members who meet on CompuServe's Amiga Forums feared the worst. But as the months pass, many in the tightly knit community are beginning to feel confident that their favorite computer does indeed have a future." (*CompuServe Magazine*, Dec. 1994, p. 9)

TIMELINE

1979: TI-99/4A, Atari 400/800, VisiCalc, WordStar, dBase, Space Invaders, *Popular Computing* and *Compute!*, Gary Kildall, founder of Digital Research and author of CP/M, fails to reach an agreement with IBM on the cost of creating a 16-bit version of his Operating System for their planned IBM PC.

1980: VIC-20, Apple III, TRS-80 Color Computer, *Computer Shopper*, *80 Micro*, *Softalk*.

1981: IBM PC, Osborne I, Zork, MS-DOS, Ultima, *Commodore Magazine*, *Infoworld*. DOS 1.0 is released and becomes a "standard" when IBM negotiates the right to use it on its new 16-bit IBM PC. The program is licensed from Bill Gates and Paul Allen, dba Microsoft, who in turn have licensed the DOS from another programmer in California.

1982: Commodore 64, Pieball Construction Set, PC-Talk, Norton Utilities, *Antic Magazine* (Atari), *Computers and Electronics*, *Family Computing* (now known as *Home Office Computing*).

1983: Apple IIe, Apple Lisa, IBM PCjr, Coleco Adam, Tandy Model 100, CompaQ portable, Flight Simulator, Microsoft Word, Lotus 1-2-3, PC-Write, WordPerfect, Turbo Pascal, *PC Maga-*

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zine, *InCider*, A+ (Apple) magazine, Osborne Computer files for bankruptcy protection under chapter 11. DOS 2.0 is released allowing hard disk drives to be used in PCs. IBM legitimizes the "Home Computer" market by releasing the long-awaited "Peanut" computer that would be called the IBM PCjr.

1984: Apple IIc, Appleworks, Commodore 16, *Compute!'s PC* and *PCjr* magazine, Data General/One, IBM PC AT, Macintosh, *MacWorld* magazine, Microsoft Windows, *RUN Magazine*, Sidekick, Tandy 1000, Tandy 2000, Ashton-Tate Framework, 20mb hard disks from Shugart and Cogito, Flashcalc, a \$99 spreadsheet for the Apple II from VisiCorp. George Tate, the man who bought the Vulcan database and marketed it as dBase II, who was the founder of Ashton-Tate (there was no Ashton, the name was

made up by Tate), dies August 10 at age 40.

1985: Amiga 1000, *AmigaWorld* magazine, Apple Laserwriter, Atari ST, CD-ROM, Commodore 128, Excel, *MacUser* magazine, Pagemaker.

1986: Apple IIGS, GEOS, Microsoft Works, *Publish* and *STart* magazines. Commodore International either loses or gives up the back page advertising space in *Compute!*, a space it has occupied since January 1983. According to Michael Tomczyk, author of *The Home Computer Wars*, having locked up the back of any magazine for your product(s) is a coup in the marketing field.

1987: Compaq 386-20, Macintosh II, Hypercard, *Compute!'s PC Magazine*. Robert C. Lock, founder and editor-in-chief of *Compute!*, leaves the magazine to "explore new horizons." I don't know whether Lock left by design, or was forced

out, but his departure, like that of J. Tramiel from Commodore, spelled the beginning of the end for *Compute!* I was never fortunate enough to meet the man, but his presence and editorial prowess, along with his vision of where home computing should be going, were an inspiration. He founded and published the *Signal Research Report* for a short time afterwards, but it went belly-up and I haven't seen or heard about him since. I hope that Mr. Lock is doing well in whatever endeavor he's found, because he is a truly significant part of the home computer era of the 1980s. A big shake-up in Commodore's upper management occurs when Commodore Chairman Irving Gould fires Thomas Rattigan, Alan Gauthier, Nigel Shepherd and others. *Reader's Digest* sells The Source to a group of venture capitalists.

Forget about assembly; C is what you need

By DAVID ORMAND

As processors become more and more sophisticated, particularly with the RISC machines with features (like look-ahead branching) which are not exactly easy for humans to understand or use, it becomes less and less feasible to program computers in assembly language. It hurts me to say that, since I am by preference an assembly language programmer, but those are the facts.

Assembly language seems to be the domain of special stuff, like boot or startup code, or time-critical stuff like interrupt service routines, or writing operating systems and compilers, but not for general-purpose application writing. The inescapable trend is to high-level languages, and in the market today, there are only two real choices: Pascal-like languages, like Pascal, Modula-2, and Ada, and C (and its extension, C++). The Pascal-like languages, in practical usage, are really represented by Ada, which was developed for the defense industry but is not in heavy use anywhere else except for Europe. The predominant language in science and industry, then, is C, and therefore it is almost mandatory for anyone who intends to program computers for anything more than pleasure to learn the basics of C.

The good thing here is that, while the TI doesn't have Ada (it is bulky, to say the least), it does have Pascal and C. The last time I looked (without keen interest, I must confess), Pascal required the use of the P-Code card, which is not a universal TI peripheral. C, on the other hand, results in E/A Option 5 program files, which al-

most anything can load. So you can use C on your TI, not only to learn the most commonly used programming language in the world, but also to create fast, compact, and easy-to-use TI programs.

Let's get started. What you need are the TI disks for C99 version 4.0, by Clint Pulley. Versions for the TI99/4A and MDOS on the Geneve are available. What you find on the disks are:

- Documentation;
- Compiler program (C99C, D, E);
- Include files more about those in a moment);
- Library files.

Other things you need are an editor (like a TI-Writer clone) and an Assembler (like the ancient TI assembler, but the RAG assembler is better).

Okay, run your editor program. C programs are just text files, like letters and stories, so you can use any old editor that writes a D/V80 text file to write C programs. Enter the following program

```
#include "DSK1.STDIO"
extern printf();

main()
{ int i;
  for(i=0;i<5; i++)
    printf("Hello number %d\n",i);
  /* Print the numbers out */
}
```

(See Page 23)

C IS WHAT YOU NEED —

(Continued from Page 22)

Then save it as file DSK2.TEST_C. Now let's look at this simple program.

The first line is an "include" statement DSK1.STDIO is an "include" file. If you want, you can load DSK1.STDIO into the editor and look at it; it is a series of C-language lines. When the compiler program sees an "include" statement, it loads the file and compiles it just as if it were part of the program. This makes it rather like a "COPY" command in assembly language.

C is a library-oriented language. Unlike BASIC, where all the tools you need are always available — like SIN() or SEG\$() — in C you have to load the library with the functions you want. Plus, you have to tell the compiler that you are using library functions and features. DSK1.STDIO has a bunch of constants defined to allow you to use standard input and output, such as files or keyboard or display. The next line, "extern printf();", tells the compiler to use the function printf() out of a library file. Note that on other machines the printf() function will be part of the STDIO include file, so you wouldn't have to say "extern." This is just a TI-C99 thing. Also, on other machines, the STDIO include file is called "stdio_h". Which is why you might want to look on your disks and see if you have STDIO or STDIO_H, and use the correct filename in the program above.

The "extern" is a flag to the compiler that the symbol "printf" is a function defined in an external file. This is exactly the same as "REF" in assembly language.

At this point in your experience with C, it is enough to know that everything is functions. That's not exactly true, but right now it's good enough. The "printf()" is a function that prints formatted text strings. And "main()" is the function that is run when the program is started, just as if it were the lowest line number in BASIC. Notice all functions have parentheses after them, just like the BASIC functions. The arguments would go inside the parentheses, just like BASIC, and if there aren't any arguments, you have empty parentheses, just like the "main()" function here. Note that when you use "extern" in a C99 program, you use empty parentheses to tell the compiler that this is an external function (as opposed to an external variable).

The lines following the "main()" function start are enclosed in curly braces. In C terminology, this is called a "body." Whenever you have several lines that go together, you put them in a "body" enclosed with curly braces. Also, note that most of the lines have semicolons at the end. You always end a statement with a semicolon. This does not include compiler statements that start with a "#".

Since the curly braces enclose lines with semicolons, you do not put a semicolon after the last curly brace. This is why the "main()" function has a body with curly braces and no semicolon after the last curly brace, but the "for" loop has a single statement with a semicolon, and no curly braces at all. If you wanted the "for" loop to do more than one thing, you would put all the desired statements in a curly-braces "body."

The next line declares the variable "i" as an integer. Unlike BA-

SIC, where you can invent variables any old time as you need them, you have to declare all the variables a function will use up at the beginning of the function.

C99 is a "small-C" compiler, which means it handles only integers, characters, and arrays of integers and characters. This is pretty good, though; you can do almost anything you want with this. In C99, an integer is a 16-bit word, and a character is an 8-bit byte.

The next line is a loop. There are several kinds of loops in C, such as the "do... while()", where the statement (or body of statements) are executed until the logical expression in the parentheses of the "while" is no longer true; the "while()" loop, which is the same except that if the expression in the "while" is false to begin with, the body isn't executed at all (the do... while always executes the body at least once); and the "for" loop, which is pretty much the same as a FOR... NEXT loop in BASIC. Inside the parentheses of the "for" are three things — the initial state, a continuation expression, and an increment. For this "for" loop, the loop variable is "i", and it starts off at zero. The loop continues as long as "i" is less than 5. And at the end of each iteration of the loop, "i" is incremented. The "i++" business is a C peculiarity. It means the same thing as "i=i+1". Sometimes you might see this as "++i", which does the same thing with a subtle difference which isn't important now. If you wanted to increment or change the variable by more than 1, you could write the increment expression any way you wanted, for example, "i=i+3" or "i=i/2" or whatever. Oh, and "i—" (or "—i") will decrement "i" by 1.

As long as the continuation expression of the "for" loop is true, the statement or body following the "for" will be executed. In this case, it is a single statement, which is a call to the external "printf" function with these arguments.

The "printf" function is a powerful and popular C function, and deserves some explanation. The first argument is the for-at string. When the "printf" function is executed the text in the for-at string is printed on the screen. Anywhere a "%" symbol is found, the corresponding argument from the arguments following the format string is printed. The "%d" control causes the argument to be printed as a decimal number. Using "%x" would print it as a hexadecimal number. Using "%c" would convert it to a character (so a number 65 would be printed "A"). And "%s" prints a text string. In this case there is only one "%d", so only one additional argument is expected, which is "i", so "i" will be printed as a decimal number. The "\n" thing is called a "newline," which starts the printing at the beginning of the next line, just like a ":" in a BASIC PRINT command.

C is kind of a cookbook language. Like BASIC, for the most part, you just look up the functions in your manual and figure out what kind of arguments to give it. The same is true in C. In fact, the manual is little else, just the functions and which library and include file you need to use. At least the BASIC manuals tell you how to use the language, which is why so many Tiers could get started without any help. I have yet to see a C manual that explains how to use the language, which is why tutorial articles like this one keep getting written.

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C IS WHAT YOU NEED —

(Continued from Page 23)

Oh, a few more things before we compile. I hope you entered the program just as it was shown, with lowercase letters. C is a "case sensitive" language, unlike BASIC which automatically converts all the letters to uppercase. And C, unlike BASIC or Pascal, uses lowercase almost everywhere.

The blank lines, spaces, and indentations are not as important. The compiler ignores all that; you could have jumbled everything together on one line, but you can guess how ugly that would be. So the rule is to use spaces or tabs or blank lines or whatever to help your program be understandable. By the way, did you notice the comment? Anything between "/*" and "*/" is ignored by the compiler, so you can explain your code. Or deactivate portions of it for debugging, a very useful attribute of comments!

Okay, let's do this. Run the C99C program out of E/A Option 5. You will be prompted for the input filename (DSK2.TEST_C), an output filename (DSK2.TEST_O), and two options; just press Enter to skip these options for now. The program will chew and convert your C language program file to a TI Assembly language program file. C compilers for other machines skip this assembly language step, but we have to live with it for now.

If you made any programming mistakes, the compiler will display the line with the mistake. The nice thing about C99 is, once you get it to compile with no errors, you are probably home free. If you used TI-Writer to create the program, the compiler will choke on the "tab" line at the end, but you can ignore this.

Now run your assembler, either the TI assembler, or RAG, or whatever you like. This converts the assembly language output of the compiler to object code. Now, load the following library and object files using E/A Option 3:

DSK1.CSUP — this is the C99 "kernel." You ALWAYS need this.

DSK1.CFIO — this is the library that goes along with STUDIO

DSK1.PRINTF — this is the external "printf" library file.

DSK2.TEST_O — this is the object file for your program.

Now you can press Enter, and give it the program name "START". If everything worked properly, you will see:

Hello number 0

Hello number 1

Hello number 2

Hello number 3

Hello number 4

This is a quick introduction to C99, to get you started. Once you get your feet wet, you can look through the manuals of the other libraries, such as for Graphics (do anything XBASIC can do with sprites, character definition, etc., Bitmap mode (write to separate pixel locations on the screen), Sound, Speech, Math, and other fun, fast features of the TI computer.

New game released

Vern Jensen, author of the TI games The Castle and Maze Mania, has announced the release of a new game for the TI, Virus Attack. Based on a hit Nintendo game, Virus Attack is a fast action strategy game with great graphics, sound effects, and continuous background music, according to the manufacturer. Having been in development for nearly two years, Virus Attack is commercial quality, according to Jensen.

Virus Attack requires SSSD disk drive and either Extended BASIC or Editor/Assembler. The instructions require Extended BASIC. Joysticks are optional. Virus Attack can be ordered for \$15, plus \$2 S&H, from Vern L. Jensen, 910 Linda Vista Ave., Pasadena, CA 91103.

1995 TI FAIRS

SEPTEMBER

10th International TI-Meeting, Sept. 22-24, Wohlfahrtsgebäude der Wiener E-Werke (Welfare Building of the Vienna Electricity Board), Wachaustr. 28, A-1020 Vienna, Austria. For information write Kurt Radowisch, TI- and Geneve User Group Vienna, Grossbauerstr. 24, A-1210, Vienna, Austria.

TI New England Fall Faire, Sept. 30, Emanuel Lutheran Church, 200 Greenwood St., Worcester, Massachusetts. Contact Jim Cox, 905 Edgebrook Dr., Boylston, MA 01505 or (508) 869-2704.

OCTOBER

Chicago International TI Faire, Oct. 28, Evanston Public Library. Contact Chicago TI Users Group, P.O. Box 7009, Evanston, IL 60204-7009, or Hal Shanfield, (708) 864-8644.

1996 TI FAIRS

FEBRUARY

Fest West '96, Feb. 17, Ramada Inn, 1601 Oracle Dr., Tucson, Arizona. Contact SouthWest Ninety-Niners User Group by sending e-mail to twills@primenet.com. Or call the Cactus Patch BBS at (520) 290-6277.

MAY

Multi Users Group Conference, May 25, Ohio National Guard Armory, Brookpark. Contact Glenn Bernasek, 13246 Harper Rd., Strongsville, OH 44136, or call (after 9 p.m. Eastern time) at (216) 846-0865 or Internet dd314@cleveland.freenet.edu.

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

Canon BJC-4000 printer

Affordable, versatile ink-jet printing

By GARY W. COX
Mid-South 99 User Group

In looking for a color printer for both my TI99/4A and PC to share I reviewed many different brands and models. Without actually having each model on hand to do comparative testing for this review it is hard to make a complete comparison, so in this review I will focus just on the Canon BJC-4000 itself.

INTERFACE AND COMPATIBILITY

The Canon BJC-4000 comes with a parallel interface which I have tested to operate with both the TI and IBM-compatibles. By swapping cables I can have it connected to either my 4A or PC. The printer will emulate an Epson LQ-2550 or IBM Proprinter 24E, so any program which will operate with these two printer types should work fine with the BJC-4000.

As for graphics with the TI, I have not tested the printer. However, the BJC-4000 has been tested to work okay with TI-writer and, in fact, the text of our newsletter is printed on a Canon BJC-4000 from a TI99/4A! However, in order to access the color capabilities of the printer, whatever program you use must know how to send the codes to print in color. Thus, programs on the TI will not print in color unless they are re-programmed to do so.

Instead of a ribbon this type printer uses ink contained in a replaceable cartridge. This ink is what is used to produce output on paper. The paper can be 8.5x11 letter size, 8.5x14 legal, A4, No. 10 envelopes or European DL envelopes. The paper type can be plain paper (like copier paper), coated paper, glossy paper or transparency. Up to 100 sheets of plain paper can be inserted into the sheet feeder.

INK CARTRIDGES

The printer comes with two interchangeable ink cartridges. One cartridge contains only black ink and is used when only black output is desired. Thus, the black ink is not used up in the color cartridge. Furthermore, this black-only cartridge contains about three times the amount of black ink as does the color cartridge. With the black cartridge inserted, the printer can print faster than with color.

REVIEW

REPORT CARD

Cost: \$350 approximately (includes 2-year warranty)

QualityA+

ValueA

Ease of UseA-

DocumentationB+

Final GradeA

It can run as fast as 496 characters per second in draft mode and 346 cps in high quality mode. When color output is desired, the user must remove the black cartridge and insert the color cartridge. This switching can be done in a matter of seconds, as it is very easy to do.

The color cartridge itself is actually two cartridges in one. The color cartridge has two removable inkwells — one inkwell contains the basic colors of red, green and blue while the other inkwell contains black. The advantage of having separate inkwells is that if all the black is used up only the black inkwell must be replaced. Thus, if one of the colors is used up, only the color inkwell needs to be replaced leaving the black inkwell untouched. However, if just red is used up and green and blue still have ink the entire color inkwell still must be replaced. Furthermore, by having a separate black inkwell a true black is obtained rather than combining several colors to produce black. These inkwells are also easy to change.

With the color cartridge in place print speed in black only is 248 cps in draft mode and 173 cps in high quality mode. Speed of color printing varies depending on the complexity of the colors. Basically, most color print jobs will take several minutes. Color print speed ranges from 0.3 to 0.8 pages per minute. Print resolutions are up to 720 dpi (dots per inch) in black only print and 360 dpi in color print.

The printer is very quiet and requires little maintenance since the print head is actually the ink cartridge. When an ink cartridge is replaced, the print head is also being replaced!

THE OUTPUT

The output in black is excellent and I have found it almost impossible to tell the difference between this print and a Hewlett Packard Laser III printer (300 dpi). Looking very close I can barely pick out the difference between the Canon BJC-4000 and a Hewlett Packard Laserjet 4 (600 dpi) printer. In short, I am amazed at the quality of the print in black.

The print quality in color, compared to the print quality of the black, is noticeably different. The color print is not quite as sharp as the black print, but the print still looks great! To obtain better quality color print would require a much more expensive printer.

DOCUMENTATION

The printer comes with a 192-page manual explaining its operation, but it does not explain any of the escape codes necessary to program your software to send the necessary codes for color printing if your software does not recognize a Canon BJC-4000 printer. On PC systems, most programs should have a selection for a Canon BJC-4000 printer or something close to it, thus no escape code programming is necessary. However, for the TI it will be necessary to obtain these escape codes from Canon in order to program software to print in color. These escape codes appear to be available free of charge from Canon.

Programs modified for ink jet printers

Bruce Harrison has made new versions of his drawing, TI-Artist printing and Plotter programs designed especially for the Bubble Jet and other sheet-feeding ink jet type printers. These products, called DRAWBJ, TIAPRNB and PLOTBJ, have been made available through the Lima Users' Group as public domain software.

For information, write the Lima Users' Group, c/o Charles Good, P.O. Box 647, Venedocia, OH 45894, or email cgood@osulima1.lima.ohio-state.edu.

MICRO-REVIEWS

Christmas Music, Music Programming Aids, Plotter, PRNINST, INSTEDIT, The Harrison Drawing Suite

By CHARLES GOOD

Once again this month's column is mostly about Bruce Harrison software. If it wasn't for Bruce I wouldn't have much to write about and MICROpendium wouldn't have nearly as many pages of original material to publish. Thanks Bruce!

CHRISTMAS MUSIC

by Dolores Werths

Do you remember Bruce Harrison's *Nutcracker Suite* music disk? This Christmas music disk is one of the all time favorites of 99/4A users. (If you don't have it send me \$1 and I'll ship this music right off to you.) This and other older Bruce Harrison music disks, all now public domain, are technically the ultimate in 99/4A music. They are not the plinky plink square wave sounds typical of much TI music. These music disks stretch the capabilities of the 99/4A's sound generators to the ultimate, resulting in music that is almost Soundblaster quality. Although Bruce did most of the assembly programming, his partner Dolores Werths actually wrote the musical arrangements. Now she is at it again.

Just in time for Christmas Dolores Werths is releasing three disks of Christmas music, complete with the Harrison "instrument" routines as in the previous Harrison music disks. This is a commercial offering, the only software described in this month's column that you can't get from me. The cost is a very reasonable \$4 per disk or \$10 for the set of three. Prices include shipping and handling. The music is 99/4A-compatible and requires no special equipment beyond 32K and a disk drive to play.

MUSIC PROGRAMMING AIDS

by Bruce Harrison

If you are a music programmer wannabe, if you want to make your 99/4A music sound as good as Bruce Harrison's and Dolores Werths', then help is available. Bruce has released three disks to aid assembly programmers and C programmers make sense of sound lists. They are LISTMAKER (DSSD), ADVANCED SOUND LISTS (SSSD), and CSOUND (DSSD). The first two are for creating music in assembly language and the third is for use by C programmers. These are public domain. You can get them from me for \$1 each.

PLOTTER

by Bruce Harrison

Have you seen those neat Texas Instruments graphing calculators in the stores? I refer to the TI-80, TI-81, TI-85, and the newest, TI-82. These are now very popular items in calculator technology, completely capturing the high-end calculator market from earlier models of TI "keystroke programmable calculators" such as the TI59 and TI95, and from BASIC programmable calculator/computers such as the CC40 and the TI-74. They all have a relatively large, almost square, LED screen at the top which allows you to enter equations and have them graphed for you on the screen. You get a nice display of sine waves, parabolas, ellipses, etc. They can be programmed by storing data in their "registers" (memory locations). The more expensive ones have lots of memory and work with an extra cost interface that lets you dump data to a table top computer. College students and engineers carry these calculators around with them today in book bags or attached to their belts the way college students of my day carried slide rules. Well, thanks to Bruce Harrison's latest public domain software our 99/4As can now do anything the graph-

ing calculators can do except fit in your pocket.

As you know, in either BASIC our computers have an excellent suite of mathematical functions (PI, ATN, LOG, TAN, etc.) and very accurate calculating to many digits with no rounding off errors. What BASIC lacks is an easy way to plot equations on screen in high resolution using individual pixels for the plot. There is old (1983) all BASIC software that puts high res equation plots on screen, but the display takes forever to build, and all you can do is look at the end result. Bruce has solved this by creating a group of BASIC plotting programs with embedded assembly code that quickly puts the plot on screen in bit map mode, and he has added all kinds of neat extras not found in the old software.

With each of the PLOTTER programs you edit line 100 of the program and there you insert the equation(s) you want graphed. When you run the program you are prompted for the position of the X axis (horizontally across any of the screen's 192 pixels of vertical resolution) and position of the Y axis anywhere along the 256 pixels of screen width. You also get to specify a "Y scale factor" which can magnify the vertical part of the plot. The natural scale factor is 1, and some plots would look very flat on such a scale so you can balloon the plots by specifying a scale factor of 20 or 40 to make them look good on screen. Once you enter the Y scale the computer takes about 30 seconds to calculate 256 plot points and display them on screen along with solid lines for the X and Y axes.

Now for the fun! You can press S to save the plot to a 25-sector TI Artist compatible "_P" file. You can also load any previously saved plot into PLOTTER. If you want to add text to your plot just load it into Bruce's DRAWING PROGRAM and type your text anywhere on screen, then print the result and/or save it back as either a TI Artist picture or a Drawing Program format picture. (The latest version of Drawing

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MICRO-REVIEWS —

(Continued from Page 26)

Program both saves and loads TIA pictures). From within PLOTTER you can also print a plot to almost any 9- or 24-pin printer including my ancient Gemini 10X.

Here is the most amazing feature of PLOTTER. You can put an equation in line 100, run the program and display the equation's plot. You can then break the program (Fctn/4), edit line 100 with another equation, run the program again and get your second plot on screen. Now press O (for "overlay") and your first plot is displayed on screen along with the second plot! They are both there on screen. When you ran your first plot and then issued the break command (Fctn/4) to get into command mode so you could change line 100, your first plot didn't go away. It was stored in a buffer waiting for the overlay command to be issued. You can also load a plot from disk, load a second plot from disk (or create one from the equation in line 100), and overlay them both on screen for printing or saving to a disk file. Printing as well as loading and saving to disk files does not work in a Geneve. Plotting to the screen and overlaying does.

On the same DSSD or SSSD disk there are three different versions of PLOTTER, depending on the type of equation. In one, Y is a function of X, such as $Y=\text{SIN}(X)$. In another version, for parametric equations, both X and Y are a function of a third parameter P and you plot simultaneous equations such as $X=3/4*\text{COS}(P)$ and $Y=1/4*\text{SIN}(P)$. The third version of PLOTTER is for equations using polar coordinates with plots radiating out from the X/Y origin. Each of these is a separate XB/assembly program.

What's that you say? You're not an engineer. You're not a college student with a major in science or mathematics. You didn't understand algebra when you took it in high school and have never heard of trigonometry. Don't worry, this software is still fun. Just randomly play around with the equations in line 100, and the input variables that assign the X and Y axis and see what you get. The results, even with random equations, can be beautiful. Bruce includes several sample plots saved on disk in TI-Artist format. Each is a work of art suitable for full page printing with his TIA printer (reviewed last month) and framing.

The documentation is idiot friendly. Just do what it says, enter the values suggested, and you will get beautiful geometrically interesting plots. Bruce is a retired engineer, so if you have really serious (or not so serious) questions on using this software you can make use of a feature not found in other public domain software offerings, the Harrison Help Line. In the Plotter docs he says, "Should you have questions, comments, or need help, the author is readily available by mail or phone. ... We answer all mail! By phone, we're available from 9 a.m. through midnight Eastern time, seven days a week." Amazing!

Send me \$1 and I will send you PLOTTER. Please specify the version you want: DSSD disk with lots of sample plots for 9-pin printers, SSSD disk for 9-pin printers with fewer sample plots, DSSD disk for 24-pin printers, or DSSD disk for Canon Bubble Jet printers (tested on model BJ-200e).

PRNINST by Bruce Harrison STATE INSTANCES origin unknown

Here is another public domain offering from Bruce. This one will print any TI-Artist instance, automatically centered left/right on a 8.5-inch page. The instance is printed a couple of inches tall. PRNINST is designed to let you use a TIA instance as part or all of a letterhead. Just print your favorite instance at the top of the page, then load up a word processor and print your letter below the graphic. It works on 9- and 24-pin printers, including my SG10 and 10X printers. On 9-pin printers you have your choice of single or double density printing. Double density looks really good!

Just load PRNINST from Editor/Assembler5 or E/A3 (there is no Extended BASIC loader). You are asked for your printer name. Just accept the PIO.CR default. Then you are asked for the full path name of the instance. Once you enter this information printing begins.

I'll send you PRNINST on the same DSSD disk that has EDITINST (see below) complete with source code, some sample instances, and documentation. If you want I can also send you on another (DSSD) disk instances of all the 50 United States. Most

of these state instances include text of the state's motto. These state instances make great letterheads, particularly if you modify that of your state with your own text and perhaps mark it with your specific location within your own state.

INSTEDIT by Bruce Harrison

Since the Harrison Drawing program allows you to load instances but doesn't allow you to manipulate them, Bruce has made an Instance Editor. You can do almost anything with this editor that you can do with his drawing program, but there is no color. Everything is black and white.

You can load in an existing instance or a drawing program picture or a TI-Artist picture for modification and saving back to disk as an instance. When loading in a big picture, you delete those areas of the picture you don't want to save and save the rest back as an instance. You can also create an instance from scratch.

When editing you have a cursor which can be moved in the usual eight directions with the keyboard or a joystick. The cursor can be in the pen up or down position. When down you mark in black one pixel at a time on the screen, which is in bit map mode. You can also create lines between marked spots A and B, make perfect circles, and fill in enclosed areas with black. You can even take a small instance, put it on screen and make duplicate copies of it elsewhere on the screen, creating larger instances that are multiple copies of the original. You can add text to your instance using any CHARA1 font or a TI-Artist "_F" font. This is a powerful editor.

INSTEDIT comes on the same DSSD disk that contains PRINTINST. Source code for both programs, docs, and sample instances are included.

THE HARRISON DRAWING SUITE by Bruce Harrison

Here is a list of public domain drawing software by Bruce Harrison. The output of each piece of software can be used by the others as described below. These have all been reviewed by me in this or a previous

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MICROREVIEWS —

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month's column, but some have been recently updated with new printer drivers and new features. With these programs you can do almost anything TI Artist can do, and a whole lot more. Everything listed here is public domain and available from me for \$1 per disk.

- **PLOTTER:** reviewed by me this month. Different versions for 9- and 24-pin and bubble jet printers, SSSD and DSSD versions.

- **PRNINST** and **INSTEDIT:** reviewed by me this month. Create or edit instances. Print with 9 or 24 pin printers instances centered on a page as a letterhead. Both on the same DSSD disk. DSSD disk of USA state instances also available from me.

- **DRAWING PROGRAM:** newly updated to save in TI-Artist format as well as in its own Drawing Program format and with ad-

vanced printer drivers. Can import Drawing Program pictures as well as TI-Artist pictures and instances, and can use TI-Artist fonts or CHARA1 files for text. Three versions each on a DSSD disk: 9-pin printers, 24-pin printers and Cannon Bubble Jet printers. Does not work on a Geneve or on systems with 80-column cards.

- **TI ARTIST PRINT:** prints TI-Artist pictures to full 8.5x11-inch size. TI-Artist can't do this. And everything is correctly proportioned. Circles look like circles. Three versions: one for 9-pin printers, a new version for 24-pin printers and a new version for Canon Bubble Jet printers, each on separate SSSD disks with source code.

- **VIDEO TITLER:** Manipulates Drawing Program or TI-Artist pictures for recording on videotape as title screens. Examples can be seen in the 1995 Lima conference videos. DSSD disk with samples.

- **FONT CONVERTER:** Can convert all 130 Jim Peterson XB screen fonts into CHARA1 files which can be used in Drawing Program. SSSD disk with sample converted fonts. The set of Jim Peterson screen fonts, with XB demo programs to view the fonts, is available from me on three DSSD disks.

- **SLIDE SHOW:** Displays TI-Artist pictures in slide show format. Many options for timing and ordering of pictures. One DSSD disk.

ACCESS:

Bruce Harrison or Dolores Werths: 5705 40th Place, Hyattsville, MD 20781. Phone (301) 277-3467.

Charles Good: P.O. Box 647, Venedocia, OH 45894. Phone (419) 667-3131. Internet email cgood@osulima1.lima.ohio-state.edu (preferred) or good.6@osu.edu

Vienna TI fair features stock market program, teletext package

By JIM UZZELL
DDI Software

As an attendee, I was disappointed with the way the TI fair in Vienna was organized. There was no schedule, and, as I cannot speak German, some of the group sessions in German were a total mystery. But that was my problem and over all the fair was a success because I was able to meet some of the people I had known only by mail as well as meet other TI/Geneve users.

From the Geneve perspective, there were a couple of new products that got my attention.

The first one, *Moneybuy\$*, a stock market analysis program, was the most professional program I have seen for the Geneve.

This program runs from DOS and allows you to have 10 groups of five files per group with a maximum of 20 funds (stocks) per file with nine columns of programmable data per fund.

You can have more than 10,000 days per file. There are 27 graphics available, all programmable, which resemble the ones in *Wall Street Journal* or *Barrons*. These graphics can be full screen or you can use a split screen and have up to three different funds displayed in 424x512 resolution, with screen dumping. You have mouse as well as keyboard control.

If you are in the stock market, I recommend you check this program out. For more information, contact Roeland Muys, Koophandelspein 31, 9000 Gent, Belgium. Tel: 09/223.51.48.

The second one, *Teletext*, is both a hardware and software

package. Using this program with the hardware attached to the RS232 port and a TV that is hooked to a satellite receiver, cable system or a broadcast station, you can capture live information from teletext service. This service is widely available in Europe. This program can be used on either PAL or NTSC systems. The teletext card has 8K of memory or eight pages of information and transferring one page to computer takes less than a second. The information can be saved in ASCII format to a device, but any graphics that are displayed are stripped from the file. I am not sure of the availability of teletext in the United States. Maybe it is available through the Internet.

The exciting thing about this program package is that it works on both the TI99/4A and the Geneve.

For more information, contact Oliver Arnold, Hauptstr. 44, 69517 Gornheimertal, Germany, or e-mail oliver@thorin.swb.de.

I also announced the release of or demonstrated the following programs: *MYMENU2+*, *MYBASE*, *DDI-ICON*, *TIPSPAIN*, *GRABBER* and *PXLGRABBER*. For more information, contact Jim Uzzell, (U.S.) HQ Airsouth, PCS 813, Box 105, FPO, AE 09620; (other countries) Airsouth (NATO), Bldg. Q, Box 105, Viale Delca Liberzione, 30124 Bagnoli, Naples, Italy.

As I was leaving Vienna, two days after the fair, a user informed me of a project that was started in April and was close to being finished. They had put TI99/4A on a card in the Peripheral Expansion Box. Watch for more information on this.

USER NOTES

24-pin printers and Page Pro 99

The following was written by Mickey Cendrowski of the West Penn 99ers. It has to do with printing to a 24-pin dot-matrix printer with Page Pro 99.

After reading about Ron Warfield's Artist Cardshop tip for 24-pin printers, I got to wondering if the same procedure might hold true for Page Pro and 24-pin printers.

Well, wonder no more. I'm here to tell you it does.

If you are using Page Pro 99 and wish to print your pages with your 24-pin printer, this is what you do:

First, make a backup of your Page Pro 99 disk.

Then, working with your backup, sector edit your disk, searching for the string 184108. Change it to 183314.

That's all there is to it. Your Page Pro 99 page should now print out correctly without printing one page out at one and a third pages, and without the venetian blind effect.

Unlocking a RAMdisk

This item appeared in the West Penn 99er News.

Here are the symptoms:

Your Horizon RAMdisk locks up and won't access even the physical drives.

The system will seem to work, but the disk controller light will be on.

Turning the console off and on doesn't seem to work.

Here is what to do:

Plug the Editor/Assembler module into the console. Turn the PEB and the console off. Then turn the console on first. That's right, first.

Then turn on the PEB while holding down the shift key. Select Option 5 from the E/A menu and load CFG from the floppy that came with your RAMdisk to configure the system.

Strangely enough, the disk access reappears. The RAMdisk directories are still intact, as well as their contents.

Next, reload the ROS you usually use.

Do not throw out the existing information. Exit CFG and everything should be fine.

This may not work for everyone, but it's certainly worth a try.

Limit of Logo

The following was written by Stephen Shaw of the TI user group of the United Kingdom.

The Logo manual contains an "Animal" program. If you key it in and build up the knowledge a little, say by adding three or four extra choices, as the program runs, then save it to disk you will find that RECALLING the procedure will lock up your console.

On page 7 of the Logo manual, you can find the information that input lines are limited to 127 characters.

Here is the clue! BASIC program lines are also limited to 127 bytes after tokenisation has occurred, which is why you can sometimes key in fewer than the five screen lines Extended BASIC allows and still get a Line To Long error message.

Back to Logo, as you play Animal, the knowledge list gets longer and longer. Once it exceeds 127 bytes, it becomes incapable of loading back into the console. The file is just too long for the routine which reads the disk and places the definitions where they belong.

Once you have been playing Animal for a while, if you wish to save it, you must first reduce the list attached to knowledge to under 127 bytes. You can do this in immediate mode or write a routine to do it, perhaps call it "reset."

Another 96 characters

The following was written by Jim Folz. We found it in Hocus 99, the newsletter of the Milwaukee Area 99/4 User Group.

Many Gemini printer users don't realize that they can access another 96 characters in their printers. (The technique described here works on Epson and perhaps other printers as well.—Ed.) The 99/4A uses seven data bits to send characters to be printed. The additional characters in the Gemini printer (and some others) become

active when the eighth bit is turned on. Gemini engineers have provided an escape sequence that turns the eighth bit on and off.

In the TI-Writer formatter, .TL60:27,62 will make the eighth bit go on when a < is found in the text. If you also put in a .TL62:27,61 then > will turn the eighth bit off. Check your printer manual to make sure your codes are the same.

Many users will find it easier to use the CTRL-U sequence to access these codes when working from the editor, so as not to have to use the formatter. In this case, the sequence would be: CTRL-U, FCTN-R, CTRL-U, >, to turn the bit on. The sequence to turn it off is: CTRL-U, FCTN-R, CTRL-U, =.

When the eighth bit is turned on, the characters change. The eighth bit simply adds 128 to the ASCII value of the character you type. Consult your printer manual for the characters you want to print, subtract 128, and use the ASCII character of the resulting number.

For a complete printout of the ASCII characters and the resulting number, enter and RUN the following BASIC program:

PRINTCHARS

```
100 REM PRINT CHARS 128+ ! 2
-COL !092
105 OPEN #1:"PIO" !253
110 PRINT #1:CHR$(15)!COND !
098
115 FOR X=32 TO 80 ! 2-COL !
148
120 PRINT #1:" ";X;" ";X+128
;" ";CHR$(X+128);" "
;X+48;" ";X+48+128;" ";CHR$(
X+48+128)!147
130 NEXT X !238
140 CLOSE #1 :: END !164
```

Temperatures and humidity

The following item was written by Loren West. We found it in the TISHUG News Digest.

Recently my wife and I purchased a wet and dry thermometer at a garage sale. What is a wet and dry thermometer? It has

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USER NOTES

(Continued from Page 29)

two thermometers mounted together on one frame. One thermometer has a dish to hold water, with a wick around the bulb and the other end in the dish of water. This keeps the bulb "wet."

Due to the evaporative effect on the wet thermometer, there is usually a difference in temperature compared to that of the dry one.

With this in mind, there is a calculation that can be used to work out the humidity in percentages. After finding the calculations in our encyclopedia, out comes the computer with its powerful calculating skills and ability to control a printer.

After a short time, a simple program was put together to display the humidity in percentages on the screen. But to turn the computer on each time you wondered what the humidity is isn't feasible. So, back to the program, enter a few printer commands and now I have a graph of per-

centages. By looking down the wet temperature side and going across the dry temperature side, meeting in the center, you have the answer.

Here is the program:

TEMPCHECK

```

100 !SAVE DSK1.TEMPCHECK !16
7
110 !NEXT 3 LINES ARE USED T
O PRINT STRAIGHT TO PRINTER
:Condensed, Superscript !179
115 !OPEN #1:"PIO" !143
120 !PRINT #1:CHR$(15) !118
130 !PRINT #1:CHR$(27);CHR$(
83);CHR$(0) !046
135 !NEXT 2 LINES ARE USED F
OR INDIVIDUAL SCREEN INPUTS
TURN OFF LINES 160, 170, 230
, 240 250. !045
140 INPUT "TC DRY..":D !092
150 INPUT "TC WET..":W !112
160 !FOR W=18 TO 45 !211
    
```

```

170 !FOR D=18 TO 45 !192
175 !CALCULATION = CENTIGRAD
E TO FAHRENHEIT THEN TO PERC
ENTAGES !041
180 TFW=W*9/5+32 !125
190 TFD=D*9/5+32 !087
200 WD=TFW+TFD !233
210 H=40*WD/100+15 !163
220 PRINT "HUMIDITY %";H !2
08
221 !THE NEXT 3 LINES ARE TO
CONTROL THE OUTPUT TO THE P
RINTER !199
230 !PRINT #1,USING "###.# "
:H; !049
240 !NEXT D !038
250 !NEXT W !057
    
```

How much paint do you need?

The following program, by Jim Peterson, will help you figure out how much paint you'll need to paint a room. The pro-
(See Page 31)

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USER NOTES

(Continued from Page 30)

gram is written in Extended BASIC. It is menu driven and takes into consideration sizes of each wall, windows, doorways as well as the ceiling. Before heading off to the hardware or paint store, you might want to give this program a try.

PAINTCALC

```
100 ! PAINT CALCULATOR by Jim Peterson !212
110 CALL CLEAR :: FOR SET=1
TO 12 :: CALL COLOR(SET,2,8)
:: NEXT SET :: CALL SCREEN(5)
:: CALL KEY(3,K,S):: ON WAR
NING NEXT !060
120 DISPLAY AT(3,7)ERASE ALL
:"PAINT CALCULATOR": : "To de
termine the amount of": "pain
t needed for a room." !184
130 DISPLAY AT(8,1): "Is the
room a regular square or rec
tangle? Y" :: ACCEPT AT(9,16)
)SIZE(-1)VALIDATE("YN")BEEP:
: IF Q$="Y" THEN 160 !004
140 DISPLAY AT(11,1): "How ma
ny rectangular areas": "does
the room contain?" :: CALL A
CCEPTER(12,24,A):: IF A=1 TH
EN 160 !218
150 FOR B=1 TO A :: DISPLAY
AT(3,10)ERASE ALL:"AREA #";B
:: GOTO 170 !253
160 CALL CLEAR !209
170 DISPLAY AT(5,1): "How hig
h is the ceiling?": " ft.
```

```
in." :: CALL ACCEPTER(6,2
,HF)!235
180 CALL ACCEPTER(6,9,HI)::
HI=HI/12 :: H=HF+HI !212
190 DISPLAY AT(8,1): "How man
y walls?" :: CALL ACCEPTER(8
,17,W):: CALL HCHAR(5,1,32,6
40)!180
200 FOR J=1 TO W :: DISPLAY
AT(5,10): "WALL #";J: "Width
ft in" :: CALL ACCEPT
ER(7,7,WF)!127
210 CALL ACCEPTER(7,13,WI)::
WI=WI/12 :: WW=WF+WI :: SQ=
SQ+H*WW !180
220 DISPLAY AT(11,1): "How ma
ny doors, windows or": "other
areas not to be": "painted i
n wall #";J;"?" !127
230 CALL ACCEPTER(13,19,D)::
IF D=0 THEN 280 !192
240 FOR L=1 TO D :: DISPLAY
AT(15,1): "AREA NOT TO PAINT
#";L: "Width ft in" ::
CALL ACCEPTER(17,10,WDF)!201
250 CALL ACCEPTER(17,16,WDI)
:: WDI=WDI/12 :: WD=WDF+WDI
!040
260 DISPLAY AT(19,1): "Height
ft in" :: CALL ACCEPTER(
19,11,HDF)!080
270 CALL ACCEPTER(19,17,HDI)
:: HDI=HDI/12 :: HD=HDF+HDI
:: SQ=SQ-WD*HD :: NEXT L !105
280 NEXT J :: DISPLAY AT(21,
1): "Paint the ceiling?" :: A
CCEPT AT(21,20)SIZE(1)VALIDA
```

```
TE("YN"):QQ$ :: IF QQ$="N" T
HEN 320 !241
290 CALL HCHAR(5,1,32,640)::
DISPLAY AT(5,1): "Ceiling di
mensions": " ft in by
ft in" :: CALL ACCEPT
ER(7,2,CWF)!061
300 CALL ACCEPTER(7,8,CWI)::
CWI=CWI/12 :: CW=CWF+CWI !192
310 CALL ACCEPTER(7,17,CLF):
: CALL ACCEPTER(7,23,CLI)::
CLI=CLI/12 :: CL=CLF+CLI ::
SQ=SQ+CW*CL !241
320 CALL HCHAR(5,1,32,640)::
IF Q$="Y" THEN 340 !010
330 NEXT B !216
340 DISPLAY AT(3,1)ERASE ALL
:"Total of";INT(SQ+.5); "squa
re feet." !140
350 DISPLAY AT(5,1): "How man
y square feet will": "one gal
lon of your paint": "cover?"
!002
360 ACCEPT AT(7,8)SIZE(3)VAL
IDATE(DIGIT)BEEP:SF :: DISPL
AY AT(9,1): "How many coats?"
:: CALL ACCEPTER(9,17,C)::
G=SQ/SF*C :: G=INT(G+.5)!214
370 DISPLAY AT(15,1): "You wi
ll need";G; "gallons or": G*4;
"quarts of paint." !237
380 CALL KEY(0,K,S):: IF S=0
THEN 380 ELSE STOP !218
390 SUB ACCEPTER(R,C,Q):: AC
CEPT AT(R,C)SIZE(2)VALIDATE(
DIGIT)BEEP:Q :: SUBEND !001
```

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