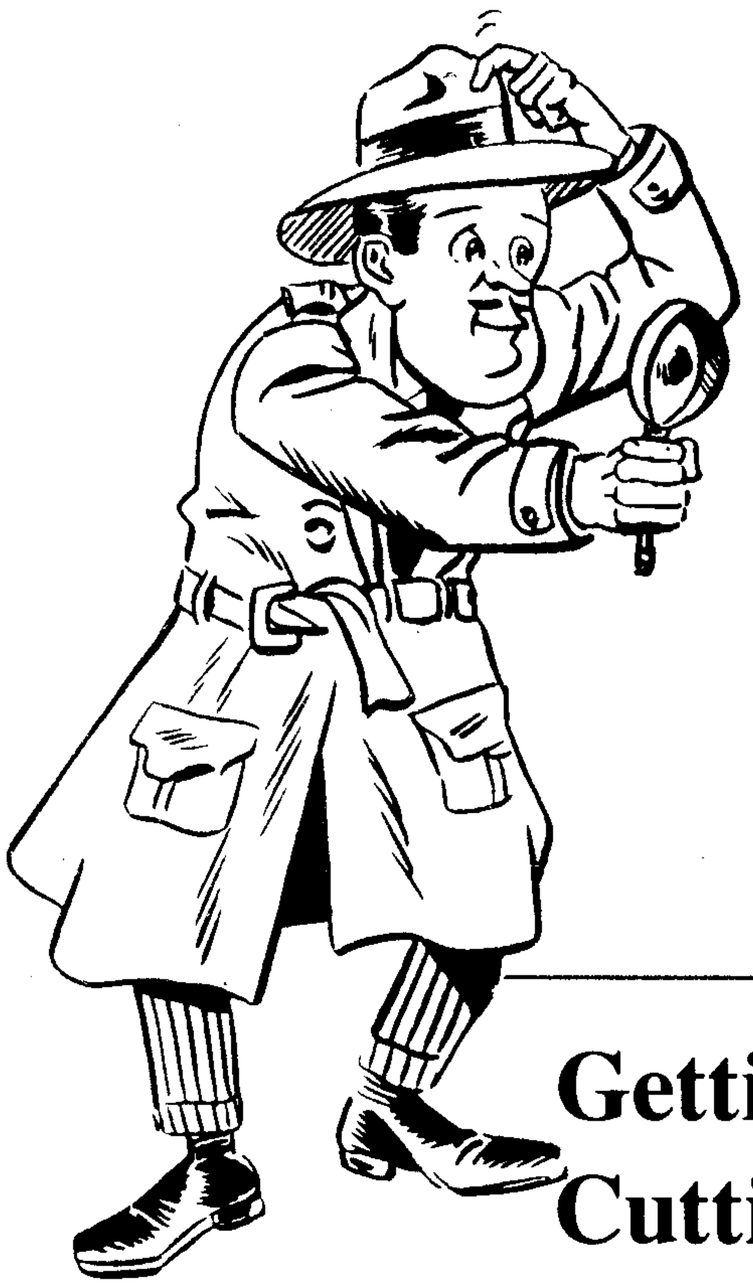
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 7 Number 11 December 1990 $2.50



MYSTERY PROGRAM

Clues to solve
the puzzle of
printer codes
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Getting TIs out of the closet
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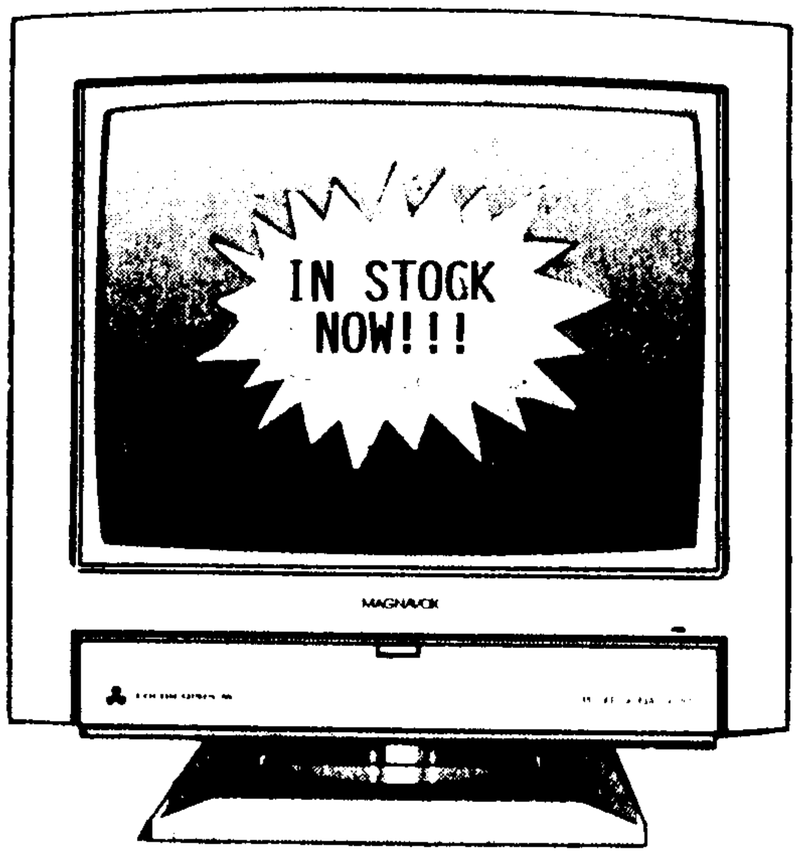

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***READ THIS**

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

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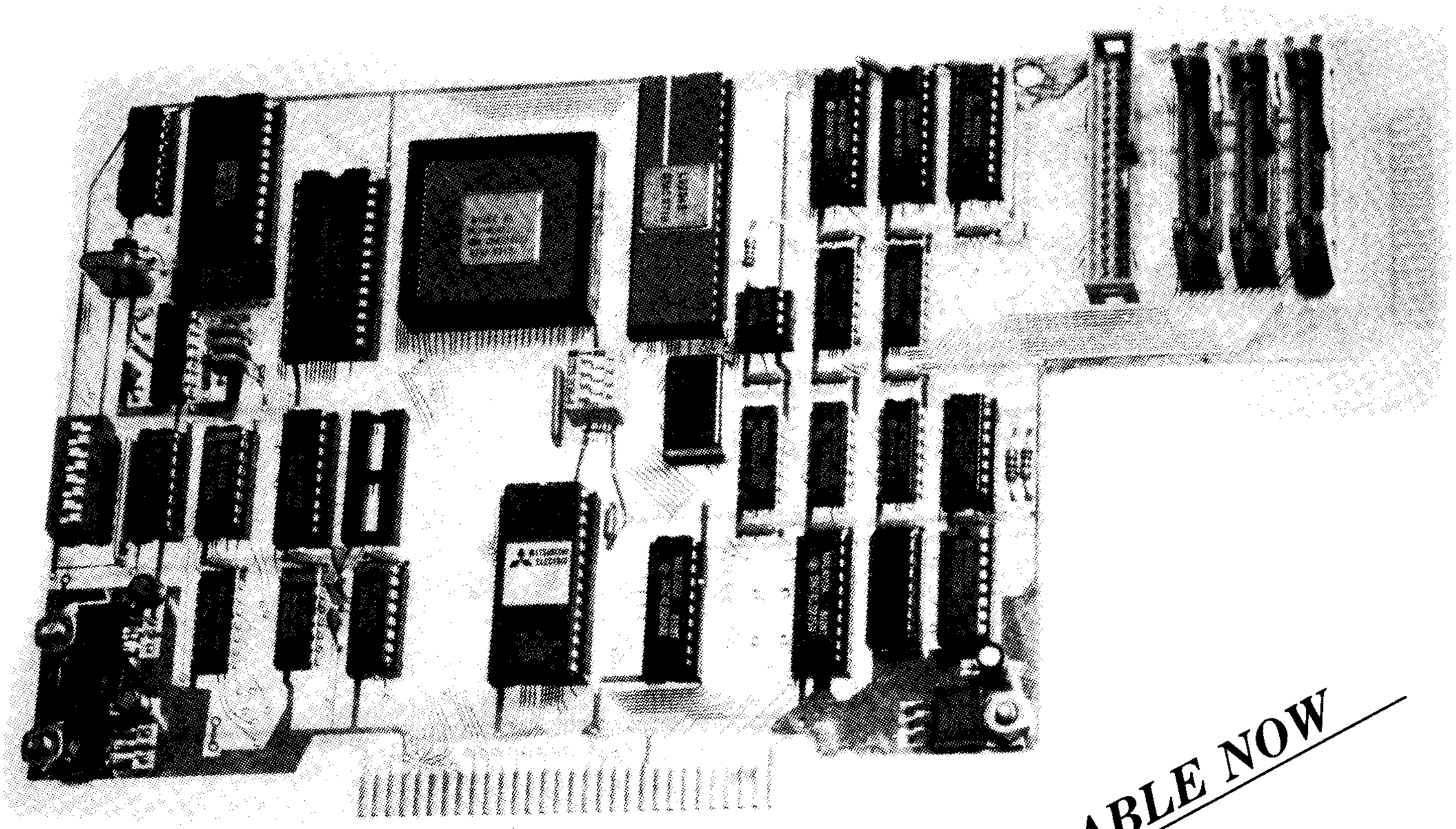

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Comments

Let the programmers take over

A SUGGESTION FROM A 9640 SOFTWARE DEVELOPER

Let's face it: Programmers who want to write for the Geneve have a hard time doing it because the system software isn't finalized. With each successive version of system software, existing programs must be rewritten. This is especially true with MBASIC. One programmer told me that he's about given up on perfecting his commercially viable programs because Myarc hasn't released enough information about MDOS and its DSRs to be able to overcome some of problems he's encountered. It does him no good to call Myarc, he says, because nobody calls him back.

I think its time for Myarc to release as much information as it has available for use by third-party types. These independent programmers are the ones who will support the Geneve, and they've been waiting long enough. Lou Phillips is cutting back on his involvement with Myarc. He has a full-time job in the banking industry, a new baby and very little time left for the Geneve. This is understandable. Lou has dedicated years of his life to support of the TI community and everyone should be appreciative of what he's done. Without Myarc we wouldn't have a hard disk controller. There wouldn't be a Geneve.

But now may be the time for him to pass the mantle of software development on to someone else. While Myarc continues to produce the HFDC and Geneve, others can finish MDOS and MBASIC. Once this is done, then the third-party developers can jump in with some confidence and know what they can and can't do with the Geneve. Meanwhile, the users should forget about the development of a Pascal runtime interpreter. That's not going to happen. But if MDOS and MBASIC can be released as finalized, then progress can be made.

ADDENDUM TO FUNNELWEB ARTICLE

Gene Bohot wrote an article about customizing Funnelweb V4.12 that appeared in the September 1990 MICROpendium, and we inadvertently left out the address of one of the software companies that he referred to in his article. Left out was Comprodine, 1949 Evergreen Ave., Fullerton, CA 92635. Comprodine markets Form Shop, which was referred to in the article. The cost of the program is $15, plus $1 shipping.

IS YAPP USABLE ON THE GENEVE?

We're carrying a laudatory review of Yet Another Paint Program-Page Pro marketed by Asgard Software. The reviewer gives the product straight A's after using it on the TI99/4A with with an 80-column device. I used YAPP on the Geneve and found it usable only with the Asgard Mouse. Most of the functions work quite well, with only a few shortcomings due to the limited VDP memory of the Geneve. However, using it with the Myarc Mouse proved unsatisfactory. I was unable to turn the pen off. Thus, whenever the pen is moved it draws, whether you want to draw or not. I could find no suitable way around this problem. It may be that there is a defect in my mouse, but I doubt it since it works fine with other programs. Of course, it is possible to use YAPP with a joystick instead of a mouse, though I did not try it. Otherwise, I found YAPP to be an interesting drawing program.

SOMETHING LEFT OUT OF FAIR REPORT

Just so you know: Ray Kazmer did the digitized pictures for Notung's Star Trek calendar. The calendar was mentioned in last month's article about the Chicago TI Faire. Also, there was a typo in Notung's phone number. It should have been 818-951-2718. We printed the wrong area code last month. Ken Gilliland of Notung is working on a new catalog. Included will be the Son of the Disk of Dinosaurs. When ready, the catalog can be ordered from Notung 7647 McGroarty St., Tujunga, CA 91042.

As for Ray Kazmer, he's been working on digitizing pictures from the PC world for use by the TI. In among his tools is a hand-held scanner. Using the scanner, he can digitize black and white glossy photos as well as line art. Typical sizes of such graphics files range from 75 to 110 sectors. The output works perfectly in Pix Pro, he says. We will have a sample of Ray's photo scanning capabilities in an upcoming issue. Part of his work on converting art from the PC to the TI has involved programming in GW-BASIC, a PC version of BASIC that is distributed with many PC clones. He says the two languages are similar and reports that a European programmer is working on a program that will convert GW-BASIC programs directly into TI BASIC or Extended BASIC.

Another project he's working on is mouse-driven game for the TI called Mousegammon. The game is like backgammon and requires an Asgard or Mechatronics mouse. The game isn't ready for the market yet, however.

Ray wants to pass on his new address: 8614 Foothill Blvd., No. 221; Sunland, CA 91040.

WHAT'S AHEAD IN 1991?

Lately there's been a lot of optimism in the TI community regarding the future. I've heard lots of talk about new products — hardware and software — that will be launched next year. A lot of the talk is in whispers, mind you, but things seem to be happening. For an idea of some of the things that may be coming out see the interview of Asgard's Chris Bobbitt in this issue. He attended the All-European TI Show in Weisbaden, Germany, in October and found a lot of ingenuity and enthusiasm.

—JK

Rescuing a RAMdisk with a corrupted ROS

Computer lock-ups as a result of a corrupted ROS in the RAMdisk are fortunately rare but when they do occur, can be quite unnerving. Switching on the system produces a blank TV screen and no action whatsoever.

The novice RAMdisk user has little option but to say goodbye to all the files that were stored on it. If this problem happens, do the following: power down, wait several minutes and remove the RAMdisk from the Peripheral Expansion Box.

Switch on the power again. If the system powers-up okay, then the RAMdisk is certainly at fault. Switch off again.

Remove one battery from the RAMdisk and wait several minutes so that any remaining capacitative charge to the memory chips bleeds away before reinserting the battery.

Put the RAMdisk back into the PEB and you ROS disk into drive 1. On the disk you should have these files: CFG, DOCS, LOAD, MENU MG OR MGR1, MH OR MGR2, ROS.

Switch on and select Extended BASIC to run the LOAD program on the ROS disk in drive 1.

Select option 1 for Configure V7.3. A screen appears showing some details of the RAMdisk on the top line and some commands on the bottom line.

Press L to load.

Select either Y or N to the next prompt.

Accept the pathname DSK1.ROS by pressing Enter. A screen of configuration fields now appears.

Press E to edit these fields. Notice that the RAMdisk LED is lighted and that whatever entries you make to the fields are sent immediately to the RAMdisk Operating System (ROS).

Ignore the 9 calls at the top by pressing Enter 18 times.

Accept the next 2 input fields on the left as is by pressing Enter 2 more times or change the colors to your choice.

For drive number type 5, for second drive type 6, and for "power-up on" type Y.

Press FCTN 9 to get back to the main screen.

Press C to configure.

In the first column, type in uppercase characters a diskname for the RAMdisk.

Accept N for W/P, write protect.

Type Y for format. You will lose anything stored on the RAMdisk, but because you had to remove the battery earlier there will be nothing on it anyway.

The last column, size, should be left as is unless you have read the documents and understand how to configure the RAMdisk as two separate drives.

Press FCTN 9 to return then Q to quit. You should now have a TI color bar screen.

Select Extended BASIC with the ROS disk still in drive 1.

Select the Disk Manager option this time and copy the file MENU and those for DM1000 from drive 1 to drive 5, the RAMdisk.

Quit with FCTN = and instead of a TI color bar screen you should now have a ROS menu on the screen.

There's just one more thing to do, and that is to copy all the files from your RAMdisk backup floppy to the RAMdisk. You do have a backup disk, don't you?

ANOTHER WAY TO DO IT

For those who don't have a backup copy of their files, and what you had on the RAMdisk is vitally important, don't follow the above instructions. Instead, insert a Mini-Memory Module into the console and turn it on before turning on the peripheral expansion box.

Select option 2 Easy Bug. If you get no response, switch both the PEB and the 4A off and start again.

Press a key to get past the info screen. Type C1000. This is assuming that the little switches on the RAMdisk are set for a CRU address of >1000.

The screen should show: C1000 >01 so type 1 and press Enter then the full stop key. The RAMdisk LED should come on.

Type M>4000 and the screen will show M1000 >AA. Type 0 and press the Enter key, then the full stop key.

Type C1000 again, but this time type the value 0, press Enter and the full stop. The LED should go off.

The RAMdisk ROS has been disabled and the contents should still be intact. Install the ROS again, remembering to answer Y to the prompt of keeping the existing contents.

This article, by an unknown author, appeared in the Adelaide (Australia) TI Computer Club newsletter.—Ed.

Happy Holidays

from MICROpendium

Feedback

Tribute paid to John Birdwell

It is always sad to hear when someone we are close to has passed away, be it family, friend or someone in the TI community. Many times, they aren't recognized for **their achievements until it is too late.**

In our midst, we have a programmer suffering from liver cancer. The prospects do not look good for his recovery. He has devoted almost all his time to his family now. Many people have wondered why this individual has disappeared from the TI/Geneve scene, and it wasn't until a week after seeing him at the Chicago Faire that I realized he had problems. He was keeping the illness to himself, but via a friend I learned. A year ago, he was a happy, healthy man; today he is a man 50 pounds thinner and several operations older.

Liver transplant is not possible. His time is running short. I doubt we will ever see updates in software from him again. He is well known for his work, and has a major piece of fairware in existence. Many people have never paid their fairware portion, though they routinely use his program.

The program is Disk Utilities, the author is John Birdwell. For those who now want to ante up their fairware contribution, John's *new* address is 1310 Kent Court, Wheaton, IL 60187.

Our local user group routinely takes in donations for fairware authors. This month, we have selected John Birdwell as our recipient. We regret it is under these circumstances, but it is about time John is recognized for his contributions.

John's other major contribution has been the work with the Myarc Disk Manager V for the Myarc HFDC (quite a bit of MDM5 was by Mike Dodd). John was planning on doing the streamer support for the Myarc HFDC, but that won't come to be by him. John was also working on Disk-One. Its status is uncertain, but it is doubtful it will be completed.

John's future is not certain. What is certain is that the higher the morale of the individual, the healthier the individual is, and the longer the individual can be productive. Prayers are acceptable, the more the merrier. When I last spoke with John, he commented, "It won't be 30 days, I don't know if it will be two months or six months. The doctors said the weekly treatments were starting to hold the cancer. I have hope."

I have only met John two or three times, but conversed through mail/messages quite a bit. John has helped me out on quite a few problems over the past couple of years. He was always willing to give. Now it is time to repay John for what he has done for us. Many times we have wished we could have said something before it was too late. It is not too late now. Speak (and user groups act) to show your appreciation. You have the opportunity now.

John, I would like to personally say thank you for providing us Disk Utilities and those other utilities that have straightened out my problems, and I am sure those of others, from time to time. It was very much appreciated. I hope you will be blessed with the cancer going into recession and with a flow of gratitude demonstrated by the TI community. You *deserve* it.

Beery Miller
Memphis, Tennessee

(Miller received permission from Birdwell to discuss his medical condition publicly before submitting this. — Ed.)

Dates, detail needed

I am writing to ask an important favor of all who write programs, articles, reviews and tutorials for the 99/4A and Geneve. That favor is to request that dates and at least some minor details of interest be included in your material. Here's why.

In October 1990, Gene Bohot of the Pomona Valley Users Group, who are cosponsors of Fest-West '90 in Anaheim, California, contacted me about putting together something to commemorate the 10th anniversary of the 99/4A. I happily agreed to the request and decided to do a timeline booklet (that has turned into a book instead of a booklet). The problem I have run into is that few if any resources at my disposal contain time or detail oriented information. In most cases I am tied to the publication date of the newsletter or magazine the information is in, but that is not always accurate. In fact, I would guess that it is inaccurate in 25 percent of the cases. Sometimes a new product release or other important announcement won't show up for two to three months after the item has actually appeared. This tends to be especially true of products released at the major TI fairs around the country — Boston, TICOFF, Chicago, Fest-West, Seattle, Lima etc.

History is important to us all, and the accurate recording of TI history is something that has been especially important to me for more than five years. I intend to continue being a 99er as long as there is at least one other TI-99er out there to share ideas and information with. I also intend to continue serving as an unofficial historian for our community at the same time. I would appreciate your help in making the job of recording our history a little easier and more accurate by including dates in the many wonderful articles and such you all write. If you have a new product, and send its release information to MICROpendium, your user group newsletter and the like, please include the month and year of official release. If you write an article about something you have inside information on, throw in those little tidbits of detail. Readers love it! It all serves to give folks like me more accurate information to record for *your* ultimate benefit. Thanks!

Bill Gaskill
Grand Junction, Colorado

Printer codes offered

We've followed with some interest the letters concerning printers and their control code sequences. We believe programs which are "printer intensive," such as those that make graphics printouts or word processors, should offer the user the ability to tailor the program for other than Epson printers. In our own Word Processor, for example, we've built in the printer control sequences for two different Epson series (FX and MX) plus two different Star Micronics series (Gemini/Delta and NX-1000). We've also provided control codes through menu selection for daisy wheel printers, and we've given the user an easy method of tailoring the system to other makes and models through a menu-selected utility. In the interest of making such capability more universally available, we offer to supply copies of that part of our WP assembly source code to other programmers working in assembly. Anybody who sends us an initialized SSSD floppy disk plus $1 to cover shipping, along with a request, will receive our "printer action" source code" on the disk supplied.

Of course ouor code won't be immediately applicable to all potential uses, but we make this offer to foster harmony on the printer issue. Other programmers will surely improve on our rather brute force method, but we hope our source code will give them a starting point.

Bruce Harrison
Harrison Software
5705 40th Place
Hyattsville, MD 20781

BASIC

Scripture quiz

By REGENA

I had a great response to my program to learn the books of the Old Testament (MICROpendium, September 1990), New Testament and Book of Mormon. Many persons who wrote wondered about other TI programs about the Bible. This program is in answer to some requests. A quiz is presented with the answers and the scriptural references.

Many games using questions from the Bible are available. I might recommend that Latter-Day Saints bookstores offer a myriad of workbooks and games including Bible trivia. The games are appropriate for any denomination (often King James version of the Bible).

Years ago I found a fun paperback book called *'Have Fun with Bible' Quizzes*, by F. Herbert Moehlmann (Zondervan Publishing House, Grand Rapids, Michigan, 1973). I have used some of his quizzes in this month's program.

This program can be used for any kind of quiz, but I call it "Scripture Quiz" because the answer includes the scripture reference. The questions, answers and scripture references are in DATA statements. To adapt this quiz for your own use, simply change the DATA statements in Lines 520-1690.

I first wrote the program with one quiz, but then I decided it was so short I could really include four quizzes within the memory of one TI program. Line 110 DIMensions string variables for the Questions, Answers and Scriptures. Each quiz may have up to 30 questions. Lines 130-270 offer the option of four quizzes or ending the program. Depending on the quiz chosen, the subroutine RESTOREs certain DATA statements.

Line 300 READs from DATA the title of the quiz T$ and the number of questions N. Lines 310-330 then read in the data for this particular quiz.

This simple quiz is in Lines 370-490. Lines 390, 400 and 450 randomly choose a question Q$ and make sure that question has not previously been used. Once the question is used, Q$ becomes "" and cannot be chosen again. The screen clears for each question, then the question is printed. Notice that each question actually starts with the "title" T$, Line 420.

Line 430 allows the user to type in an answer. Line 440 prints the given answer A$ and the scripture S$. The computer does not check for a correct answer because you could type in something slightly different from the given answer and still be correct. You can keep track of your own scoring or even use the computer as the device to print the random question among several players.

This program is nearly full memory, so be sure to use this procedure before working on the program:

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

If you want to save typing effort and would like a copy of this program, please send $4 to *REGENA, 918 Cedar Knolls West, Cedar City, UT 84720.* Be sure to specify that you need "Scripture Quiz" for the TI, and whether you need cassette or diskette.

SCRIPTURE QUIZ

```
100 REM SCRIPTURE QUIZ !004
110 DIM Q$(30),A$(30),S$(30)
!015
120 CALL CLEAR !209
130 PRINT " ** SCRIPTURE QUI
Z **": : :"CHOOSE:" !146
140 PRINT :"1  HOW MANY?": :
"2  WHO AM I?": :"3  NAME TH
E MAN": :"4  NAME THE WOMAN"
: :"5  END PROGRAM" !024
150 CALL KEY(3,K,S)!190
160 IF (K<49)+(K>53)THEN 150
 !172
170 CALL CLEAR !209
180 ON K-48 GOSUB 200,220,24
0,260,1700 !097
190 GOTO 280 !104
200 RESTORE 520 !103
210 RETURN !136
220 RESTORE 790 !118
230 RETURN !136
240 RESTORE 1040 !113
250 RETURN !136
260 RESTORE 1360 !178
270 RETURN !136
280 PRINT : : :"YOU WILL SEE
 A RANDOM": :"QUESTION ON TH
E SCREEN.": :"TYPE THE ANSWE
R AND PRESS": :"THE <ENTER>
KEY." !069
290 PRINT : :"THE CORRECT AN
SWER WILL BE": :"GIVEN ALONG
 WITH THE": :"SCRIPTURE REFE
RENCE." !120
300 READ T$,N !016
310 FOR J=1 TO N !141
320 READ Q$(J),A$(J),S$(J)!1
15
330 NEXT J !224
340 PRINT : :"PRESS <ENTER>
TO START.";!220
350 CALL KEY(3,K,S)!190
360 IF K<>13 THEN 350 !084
370 FOR J=1 TO N !141
380 RANDOMIZE !149
390 X=INT(N*RND)+1 !245
400 IF Q$(X)="" THEN 390 !06
7
410 CALL CLEAR !209
420 PRINT T$:Q$(X): : : : :!
140
430 INPUT AA$ !056
440 PRINT : :A$(X): :S$(X)!2
14
450 Q$(X)="" !191
460 PRINT : : :"PRESS <ENTER
> TO CONTINUE." !183
470 CALL KEY(3,K,S)!190
480 IF K<>13 THEN 470 !204
490 NEXT J !224
500 CALL CLEAR !209
510 GOTO 130 !209
520 DATA HOW MANY,23 !136
530 DATA WATERPOTS WERE FILL
ED WITH  WATER AT THE WEDDIN
G IN     CANA?,6,JOHN 2:6-7
!176
540 DATA YEARS WAS THE TEMPL
```

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REGENA ON BASIC—

(Continued from Page 9)

```
E IN     BUILDING?,46,JOHN 2
:20 !099
550 DATA DAYS BEFORE THE PAS
SOVER WASJESUS ANOINTED BY M
ARY?,6,"JOHN 12:1,3" !051
560 DATA DISCIPLES WERE PRES
ENT WHEN JESUS APPEARED TO T
HEM THE  FIRST TIME AFTER HI
S        RESURRECTION? !241
570 DATA 10,JOHN 20:19-24 !0
46
580 DATA TEMPTATIONS OF JESU
S DOES   JOHN REPORT?,NONE,"
" !120
590 DATA HUSBANDS HAD THE SA
MARITAN  WOMAN HAD?,5,JOHN 4
:17-18 !104
600 DATA DAYS DID JESUS SPEN
D WITH   THE SAMARITANS AT S
YCHAR?,2,JOHN 4:39-40 !115
610 DATA PORCHES WERE THERE
AT THE   POOL OF BETHESDA?,5
,JOHN 5:1-2 !175
620 DATA BARLEY LOAVES AND F
ISH DID  THE LAD GIVE JESUS
WHEN HE  FED THE 5000?,5 LOA
VES AND 2 FISH,JOHN 6:9 !104
630 DATA SISTERS DID LAZARUS
 HAVE?,2,JOHN 11:1-2 !006
640 DATA DAYS DID JESUS TARR
Y AFTER  HE HAD HEARD THAT L
AZARUS   WAS SICK?,2,JOHN 11
:6 !164
650 DATA SOPS DID JESUS HAND
 TO      JUDAS?,ONE,JOHN 13:
26 !011
660 DATA DIFFERENT LANGUAGES
 WAS THE TITLE ON JESUS' CRO
SS       WRITTEN IN?,3,JOHN
19:19-20 !248
670 DATA DAYS HAD LAZARUS LA
IN IN THEGRAVE WHEN JESUS CA
ME?,4,"JOHN 11:17,39" !241
680 DATA GREEKS CAME TO SEE
JESUS AT THE FEAST IN JERUSA
LEM?,WE ARE NOT TOLD.,JOHN 1
2:20-22 !014
690 DATA MEN REMOVED THE BOD
Y OF     JESUS FROM THE CROS
S?,2,JOHN 19:38-42 !049
700 DATA PARTS DID THE SOLDI
ERS      DIVIDE JESUS' GARME
NTS INTO?,4,JOHN 19:23 !129
710 DATA WOMEN STOOD BY THE
CROSS OF JESUS?,3,JOHN 19:25
 !062
720 DATA OF THE DISCIPLES WE
RE       STANDING BY THE CRO
SS OF    JESUS?,ONE,JOHN 19:
26-27 !183
730 DATA LEGS DID THE SOLDIE
RS BREAK ON CALVARY?,4,JOHN
19:32-33 !250
740 DATA DAYS AFTER JESUS' R
ESURREC- TION DID THOMAS SEE
 HIM?,8,"JOHN 20:19,26" !112
750 DATA DISCIPLES WERE FISH
ING IN   THE SEA OF GALILEE
WHEN     JESUS APPEARED TO T
HEM AFTERTHE RESURRECTION? !
250
760 DATA 7,JOHN 21:1-2 !149
770 DATA RESURRECTION APPEAR
ANCES OF JESUS TO HIS DISCIP
LES DOES JOHN RECORD?,3,JOHN
 21:14 !170
780 REM !186
790 DATA WHO AM I?,23 !138
800 DATA JESUS DESCRIBED ME
AS BEING AFRAID OF THE WOLF.
,THE HIRELING,JOHN 10:12 !08
3
810 DATA WE DO NOT KNOW THE
VOICE OF STRANGERS.,THE SHEE
P,JOHN 10:5 !048
820 DATA I WAS A MEAN THIEF.
,JUDAS,JOHN 12:6 !191
830 DATA I SUGGESTED TO THE
OTHER   DISCIPLES THAT WE A
LL GO TO DIE WITH JESUS.,THO
MAS,JOHN 11:16 !005
840 DATA NO ONE WILL EVER PL
UCK ME   OUT OF THE FATHER'S
 HAND.,JESUS' SHEEP,JOHN 10:
29 !156
850 DATA I WAS CERTAIN THAT
GOD WOULDGIVE JESUS AYTHING
THAT HE  MIGHT ASK.,MARTHA,J
OHN 11:22 !012
860 DATA I WAS ACCUSED OF BL
ASPHEMY  BY THE JEWS.,JESUS,
JOHN 10:33 !171
870 DATA I CAME FORWARD THOU
GH I WAS BOUND HAND AND FOOT
.,LAZARUS,JOHN 11:43-44 !001
880 DATA I SAID IT WOULD BE
BETTER   THAT ONE MAN DIE FO
R THE    PEOPLE AND THAT THE
 WHOLE   NATION PERISH NOT.
!069
890 DATA CAIAPHAS,JOHN 11:4
-50 !015
900 DATA I LEFT MY WATERPOT
AT THE   WELL.,THE WOMAN OF
SAMARIA,JOHN 4:28 !116
910 DATA I WAS THE DISCIPLE
WHO CAME FROM CANA IN GALILE
E.,NATHANAEL,JOHN 21:2 !195
920 DATA I WAS A HELPLESS CR
IPPLE ANDNO ONE CARED FOR ME
.,THE MAN WITH AN INFIRMITY
  FOR 38 YEARS,JOHN 5:5-7 !1
59
930 DATA I CONSIDERED MYSELF
 UNWORTHYTO RENDER CHRIST TH
E MOST   MENIAL SERVICE,JOHN
 THE BAPTIST,JOHN 1:26-27 !2
14
940 DATA JOHN THE BAPTIST SA
W ME     DESCEND ON THE DAY
OF JESUS'BAPTISM.,THE HOLY S
PIRIT,JOHN 1:32 !058
950 DATA I BROUGHT MY BROTHE
R TO     JESUS.,ANDREW,JOHN
1:40-42 !146
960 DATA I ASKED JESUS TO SH
OW US THEFATHER.,PHILIP,JOHN
 14:8 !191
970 DATA I AM THE TRUE VINE.
,JESUS.,JOHN 15:1 !035
980 DATA I REJOICED TO SEE J
ESUS'    DAY.,ABRAHAM,JOHN 8
:56 !100
990 DATA AT MY REQUEST A DOO
R WAS    OPENED,JOHN (FOR PE
TER),JOHN 18:15-16 !066
1000 DATA I SENT JESUS BOUND
 TO      CAIAPHAS.,ANNAS,JO
HN 18:24 !062
1010 DATA CHRIST WAS OF MY S
EED.,DAVID,JOHN 7:42 !197
1020 DATA I ASKED THE PHARIS
EES NOT TOJUDGE ANYONE BEFOR
E HEARING HIM.,NICODEMUS,JOH
N 7:50-51 !225
1030 DATA WE ASKED PILATE TO
 HAVE THE BODIES REMOVED FRO
M THE    CROSS.,THE JEWISH
LEADERS,JOHN 19:31 !173
1040 DATA NAME THE MAN,30 !1
01
1050 DATA WHO SAW THE GLORY
OF GOD.,STEPHEN,ACTS 7:54-60
```

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REGENA ON BASIC —

(Continued from Page 10)

```
!208
1060 DATA WHO WAS SO EAGER T
O SEE     JESUS THAT HE JUMP
ED OUT OF THE BOAT INTO THE
WATER.,PETER,JOHN 21:4-8 !00
2
1070 DATA WHO ASKED JESUS TO
 SHOW HIM THE FATHER.,PHILIP
,JOHN 14:8 !190
1080 DATA WHO ENGAGED IN THE
 GREATEST WRESTLING MATCH EV
ER TO TAKEPLACE ON EARTH.,JA
COB,GENESIS 32:24-30 !169
1090 DATA JESUS MADE A PREDI
CTION     CONCERNING THIS MA
N'S END.,PETER,JOHN 21:18-19
 !177
1100 DATA WHOSE NAME IS ASSO
CIATED    WITH A WHIRLWIND.,
ELIJAH,II KINGS 2 !097
1110 DATA WHOSE DEATH AND BU
RIAL ARE  RELATED IN THE BOO
K OF      DEUTERONOMY.,MOSES
,DEUTERONOMY 34:4-8 !000
1120 DATA WHO MADE A COVENAN
T WITH HISEYES.,JOB,JOB 31:1
 !234
1130 DATA "JESUS DID NOT HES
ITATE TO  CORRECT THIS MAN,
 CONSIDEREDTO BE THE GREATES
T OF THE  PROPHETS." !242
1140 DATA MOSES,MATTHEW 19:3
-9 !231
1150 DATA WHO IS THE CHRISTI
AN'S      FAVORITE EXAMPLE O
F LOVING  ONE ANOTHER.,THE G
OOD SAMARITAN,LUKE 10:25-37
!227
1160 DATA WHO GAVE HALF OF H
IS        POSSESSIONS TO THE
 POOR.,ZACCHAEUS,LUKE 19:8 !
059
1170 DATA WHO LABELED JESUS
AS GOD'S  GIFT OF SACRIFICIA
L LOVE.,JOHN THE BAPTIST,JOH
N 1:29 !209
1180 DATA WHO WAS COMMANDED
TO CUT TWOTABLES OF STONE.,M
OSES,EXODUS 34:6-9 !028
1190 DATA WHO WANTED JESUS T
O WASH HISHEAD.,PETER,JOHN 1
3:1-10 !132
1200 DATA WHO CLAIMED TO HAV
E ENTERED OUTER SPACE.,PAUL,
II CORINTHIANS 12:2 !057
1210 DATA WHO THOUGHT PROPHE
SYING WAS TO BE DONE BY A SP
ECIAL    GROUP OF MEN.,JOSH
UA,NUMBERS 11:24-30 !245
1220 DATA THE LORD SPOKE TO
THIS MAN  IN THE HEBREW LANG
UAGE.,PAUL,ACTS 26:12-14 !21
9
1230 DATA THE FIRST MAN TO Q
UESTION   GOD.,ABRAHAM,GENES
IS 18:22-23 !131
1240 DATA WHO WAS PERMITTED
TO TOUCH  CHRIST AFTER HIS R
ESURREC-  TION.,THOMAS,JOHN
20:24-31 !127
1250 DATA THIS DYING MAN'S P
RAYER WAS LIKE CHRIST'S PRAY
ER ON THE CROSS.,STEPHEN,ACT
S 7:54-60 !237
1260 DATA WHO HAD TO VEIL HI
S FACE.,MOSES,EXODUS 34 AND
35 !047
1270 DATA JESUS PRESENTED TO
 THIS MAN THE KEYS OF THE KI
NGDOM.,PETER,MATTHEW 16:13-2
0 !189
1280 DATA WHO STILLED THE PE
OPLE     BEFORE MOSES.,CALE
B,NUMBERS 13:30 !109
1290 DATA WHO DISAPPEARED IN
TO        IMMORTALITY.,ENOCH
,HEBREWS 11:5-6 !112
1300 DATA WHO WAS USED TO SA
VE THE    HUMAN RACE FROM EX
TINCTION.,NOAH,HEBREWS 11:7
!249
1310 DATA WITH THIS MAN GOD
BEGINS TO DEAL WITH A CHOSEN
 PEOPLE.,ABRAHAM,GENESIS 2:2
3 AND 12:4 !125
1320 DATA GOD MET THIS MAN I
N THE     BACKSIDE OF A DESE
RT.,MOSES,EXODUS 3:1-6 !000
1330 DATA WHO KNEW WHEN HIS
DEATH     WOULD TAKE PLACE.,
SIMEON,LUKE 2:26 !191
1340 DATA WHO WAS STRUCK DUM
B BECAUSE OF HIS LACK OF FAI
TH.,ZACHARIAS,LUKE 1:5-25 !1
05
1350 DATA WHOSE ANGER SENT H
IS BROTHERSCURRYING INTO EXI
LE.,ESAU (JACOB),GENESIS 27:
41-46 !245
1360 DATA NAME THE WOMAN,30
!013
1370 DATA WHO WAS INVOLVED I
N A       CONSPIRACY WITH HE
R HUSBAND.,SAPPHIRA - ANANIA
S,ACTS 5:1-6 !212
1380 DATA THIS WOMAN'S NEEDL
E WAS A   MISSIONARY.,TABITH
A,ACTS 9:36-43 !108
1390 DATA WHO WAS TROUBLED B
Y AN      ANGEL'S GREETING.,
MARY,LUKE 1:26-38 !171
1400 DATA WHO PLAYED AN IMPO
RTANT ROLEIN THE ORGANIZATIO
N OF THE  FIRST CHRISTIAN CO
NGREGATIONIN EUROPE." !109
1410 DATA LYDIA,ACTS 16:14-4
0 !061
1420 DATA WHO IS KNOWN AS 'T
HE MOTHER OF NATIONS.',"SARA
H, ABRAHAM'S WIFE",GENESIS 1
7:15-16 !059
1430 DATA WHO TRICKED HER HU
SBAND.,REBEKAH,GENESIS 27:5-
17 !114
1440 DATA WHO ACCOMPANIED A
GENERAL  INTO BATTLE.,DEBOR
AH (BARAK),JUDGES 4:1-9 AND
5:1-5 !166
1450 DATA THIS OLD TESTAMENT
 WOMAN IS KNOWN AS A WOMAN O
F PRAYER.,HANNAH,I SAMUEL 1:
27-28 AND 2:1-10 !244
1460 DATA WHOSE PATH LED FRO
M ORPHAN  TO QUEEN.,ESTHER,E
STHER 4:10-17 !087
1470 DATA WHO ACCOMPANIED HE
R HUSBAND ON A LONG BOAT RID
E.,NOAH'S WIFE,GENESIS 7 !08
1
1480 DATA WHO WAS THE FIRST
DEAD     PERSON RESTORED TO
 LIFE BY  AN APOSTLE.,TABITH
A (PETER),ACTS 9:36-43 !058
1490 DATA THIS PAGAN WOMAN D
REW WATER FROM JACOB'S WELL.
,THE SAMARITAN WOMAN,JOHN 4:
1-7 !086
1500 DATA WHO WAS THE FIRST
ONE TO SEETHE RISEN CHRIST.,
MARY MAGDALENE,MARK 16:9 !14
6
1510 DATA WHO WAS IMMORTALIZ
ED BY    CHRIST.,MARY OF BE
```

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REGENA ON BASIC—

(Continued from Page 11)

```
THANY,MARK 14:8-9 !047
1520 DATA WHO WAS THE MOTHER
 OF       JOHN MARK.,MARY,AC
TS 12:12 AND              CO
LOSSIANS 4:10 !240
1530 DATA "WHO PRONOUNCED A
BLESSING   UPON MARY, THE MO
THER OF    JESUS.",ELIZABETH
,LUKE 1:45 !068
1540 DATA WHO ASKED JESUS TO
 SPEAK TO HER SISTER.,MARTHA
 (MARY),LUKE 10:40 !167
1550 DATA WHO WAS ONE OF THE
S TWO    WOMEN WHO SAW THE
BODY OF   JESUS LAID AWAY IN
 THE TOMB. !190
1560 DATA MARY MAGDALENE
         MARY THE MOTHER OF
 JESUS,MARK 15:47 !137
1570 DATA COMPLETELY ENGROSS
ED IN HER HOUSEHOLD DUTIES.,
MARTHA,LUKE 10:38-42 !157
1580 DATA AN AGED WIDOW WHO
SERVED GODWITH FASTINGS AND
PRAYERS   NIGHT AND DAY. !23
3
1590 DATA THE PROPHETESS ANN
A,LUKE 2:36-37 !254
1600 DATA NEIGHBORS AND COUS
INS WANTEDTO NAME THIS WOMAN
'S CHILD.,ELIZABETH (JOHN TH
E BAPTIST),LUKE 1:57-61 !161
1610 DATA WHO WAS ONE OF THR
EE WIDOWS IN TEARS AT THE CR
OSSROADS  OF DEPARTURE.,"NAO
MI, ORPAH, AND RUTH",RUTH 1
!068
1620 DATA THIS JEWISH YOUNG
WOMAN     SAVED THE LIFE OF
A PAGAN   KING.,ESTHER,ESTHE
R 2:21-33 !216
1630 DATA WHO GAVE ADVICE IN
 THE      CONSTRUCTION OF A
GALLOWS.,"HAMAN'S WIFE, ZERE
SH",ESTHER 5:14 !072
1640 DATA A MOTHER WHO KNEW
THE       ELOQUENCE OF A BAB
Y'S TEARS.,"JOCHEBED, MOSES'
 MOTHER",EXODUS 2:14-26 !216
1650 DATA WHO WANTED TO KNOW
 WHAT WAS FORBIDDEN.,EVE,GEN
ESIS 3:1-6 !195
1660 DATA THE WOMEN OF THE N
EIGHBOR-  HOOD NAMED THIS WO
MAN'S SON.,RUTH,RUTH 4:9-17
!243
1670 DATA WHO WAS KNOWN AS '
THE       DISCARDED WIFE.',H
AGAR,GENESIS 21:14-19 !065
1680 DATA A NOTABLE WOMAN WH
O BECAME  A LEPER.,MIRIAM,NU
MBERS 12:10 !155
1690 DATA WHOM CHRIST MET WH
O BECAME A'WOMAN EVANGELIST.
',THE SAMARITAN WOMAN,JOHN 4
:29 !113
1700 END !139
```

EXTENDED BASIC

Printer potpourri

Take some of the 'mystery' out of printer code conversions

By JERRY STERN
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The topic of printer conversions keeps coming back. MICROpendium's letter column has repeatedly held requests for help in converting programs to run on printers that are only partially Epson compatible, or maybe completely incompatible. That's a big topic. There are both hardware and software issues involved in these problems, and a few tips that may allow some extra options.

I suspect that the explanations of printer codes and commands in this month's column will serve to show that most of your printers are "very compatible" with Epson codes. Follow along with your printer manual as you read, and match the table of Epson codes to those used by your printer. You may find that only some of the newer codes differ, and those codes are not used very often, because they perform functions like setting the printer for single line unidirectional printing. Not useful very often, is it?

This month's program is called MYSTERY. It prints out an illustrated message, but it also is a simple program to practice converting to other printers. All the codes used are shown in the table. Before starting, notice that MYSTERY adds ".CRLF" to the printer name. That option turns off all automatic carriage returns and line feeds, and those codes are entered by the program.

The table shows all of the codes used by the original TI99/4 Impact Printer, except for the international character command, which was NOT a standard feature on every printer in Epson's MX series. Four codes that work on the Epson Graftrax Plus printers are listed, but there are many more codes used on those printers that are not listed, not often useful, and not functional on the original TI printer. Programmers take note: The TI printer was about as simple a printer as was available in the early 1980's. If you want your programs to run on any printer with nearly no conversions, use only the codes in the table, and avoid graphics modes.

Some printer manuals will list all of the printer control codes in decimal numerals, as I will here. That is the easiest way to work with the codes, by just enclosing them in a PRINT statement.

```
200 PRINT #1:CHR$(27), CHR$(48)
```

That statement will set the line spacing to 1/8", but some manuals will represent the codes 27, 48 as 27, "0", using the zero to send the ASCII code 48 to the printer. Both methods work, but mixing numerals and characters rapidly becomes confusing, so we'll use only numerals.

Some printer manuals further confus

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EXTENDED BASIC—

(Continued from Page 12)

The technique by mixing in hexadecimal numbers; the printer command above would be 1B 30. There is no convenient way to work with hexadecimal numbers from inside Extended BASIC, so if your manual only shows hex notation, make yourself a conversion table.

PRINTER NAMES

The original TI 99/4 Impact Printer used the name "RS232" as it came out of the box, but nearly everyone changed the original settings on the serial board switches inside. The TI-Writer manual recommended 4800, so I used that speed, but many owners used the top speed of 9600. That changed the printer name to "RS232.BA=4800" or "RS232.BA=9600".

There is another important switch option on the serial board besides the baud rate; the number of data bits was originally set to seven. That switch could cause a problem when trying to print graphics, and for a purely hardware reason.

On a nine-pin printer, the top eight pins print the letters and other characters. The bottom pin is only used for lower case descending letters, like "j" and "y." Graphics are printed with the top eight pins. However, graphics codes are sent to the printer as a number from zero to 256, or two raised to the eighth power. With the data bits option set at seven, the largest number that can be sent to the printer is 128, or two to the seventh power. That means that the top dot wire is not usable for graphics. The only advantage to leaving data bits set at seven is the shorter printer name; "RS232.BA=9600" instead of "RS232.BA=9600.DA=8". Nearly all programs that print graphics, including those in this column, use all eight data bits, and all eight available printing pins. If you haven't made this change before now, make it now; I'll wait for you.

Ready? Okay, find a program to convert for your printer. First, try to run it, and watch what happens. On a serial printer, if a program appears to print, and if the light for the serial board is lit, and doesn't flicker, and the program just hangs forever until you kill it with function Clear, then the printer name is wrong somewhere in the program. The steady serial board light is a tip-off; the program is waiting for a non-existent parallel printer to send a ready signal. Find that printer name, and change it. In this column's programs, the printer name generally is in line 90, and only needs to be changed in that location.

```
90 PR$="RS232.DA=8.BA=9600" ! Default printer
```

Some programmers don't always use a string variable for the printer name. You may need to search the program for multiple printer names to change.

On a parallel printer, if a similar problem occurs, but the program continues after sitting and waiting for a long time, and the serial board light has been flickering normally, than the problem is still the printer name. The program is trying to print to a serial printer that isn't there. Since the program can't tell that the printer is missing, it will just chug away, and then go on to the next step of the program.

Printing commands are sent to the printer as numbers between zero and 127, and data values may be as high as 255. The codes from 32 to 127 are always the same; they are the letters, punctuation, and number characters. That only leaves 32 possible control codes to set all the printer options. That isn't enough ....

CONTROL CODES

Printing commands are sent to the printer as numbers between zero and 127, and data values may be as high as 255. The codes from 32 to 127 are always the same; they are the letters, punctuation, and number characters. That only leaves 32 possible control codes to set all the printer options. That isn't enough, and those few commands were already defined with standard meanings back when teletypes where the only common telecommunications printers. So codes below 32 are generally communications codes. Code seven rings a bell, code eight means backspace, ten is a line feed, 12 a form feed or new page, and 13 a carriage return. Generally, the codes below 32 should not need translation for any printer.

These old teletype commands don't leave enough codes for setting printer options, so code 27 is used as a shift code. Code 27 is called Escape. When the printer receives the escape code, it expects that the next codes will be printer commands. That shift allows another 127 printer codes, but not all of the possible codes have been used.

Most of these shifted codes consist of code 27, or escape, and the code number for a particular printer function. Code 27, 48 sets line spacing to eight lines per inch, and 27, 50 resets it to the default line spacing, usually six lines per inch.

Other codes use three characters; escape, a code number for a function, and a number that provides more information. Escape, 65, 36 sets line spacing to 36/72 of an inch, or 27, 65, 10 to 10/72". Escape, 78, 6 sets the end-of-page perforation skip to six lines.

Although the TI 99/4 Impact Printer does not use them, there is another three-character option. Many Epson printers, including the printers with Graphtrax Plus, use codes like 27, 45, 1 to turn on underlined printing, and 27, 45, 0 to turn off the option.

The tab commands are longer than three codes. Escape, 68, 5, 10, 20, 0 sets tabs at character positions 5, 10, and 20. Up to 12 tabs can be set this way, and the command must always end with zero. Once the tabs are set, the ASCII code nine is used to tab across the page. This code, and its vertical tab equivalent, are rarely used. It is usually easier to let the software control the printhead position.

All the codes above are easy to translate; just look up the equivalent command codes for your printer, and substitute them. But graphics might not be so easy. If your printer uses a different technique for indicating which pins should print dots, a program would need revisions that convert each graphics number into the equivalent code for the non-standard printer. Before

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you attempt such a conversion, try the program; if it prints gibberish, or nothing at all, than start looking in the manual to see if a conversion is possible.

The Epson graphics codes are actually very simple, if you can think in base 256. No? Binary, perhaps? The codes for single-density graphics are escape, 75, n1, n2, d1, d2, d3, ..., where n1 + (n2 x 256) = the number of data sets to print across the page. D1, d2, d3, . . . are the data values, and the quantity of them must match the numbers calculated from n1 and n2.

Each of the data numbers is calculated from the sum of the powers of 2 raised to the pin number for each dot. That means, to print a line one dot high, at the bottom position, the data value would be one, or 2 ^ 0. At the third row from the bottom, the data value would be four, or 2 ^ 2. At the seventh row, the value becomes 64, or 2 ^ 6, and the top row would use 128. Here is where those data bits become important. With seven data bits, only graphics codes up to 127, or 2 ^ 7 -1, can be transferred to the printer. The top row of pins is not used. With DB=8, all eight pins may be used. Those three lines could be combined by adding together their numbers.

```
300 PRINT #1: CHR$(27); CHR$(75); CHR$(80); CHR$(0); RPT$(CHR$(69),80)
```

This line prints a single density triple line one inch wide. The 69 is the sum of 2 ^ 0, 2 ^ 4, and 2 ^ 7, and the 80 repetitions fill one inch. Double density graphics work the same way, but squeeze the dots close together. Changing the 75 to 76 in line 300 would result in a darker line, half an inch in length.

```
320 PRINT #1: CHR$(27); CHR$(76); CHR$(80); CHR$(1); RPT$(CHR$(69),336)
330 FOR L=1 TO 2::PRINT #1: CHR$(27); CHR$(76); CHR$(168); CHR$(0); RPT$(CHR$(69),168)::NEXT L
```

What are the differences between lines 320 and 330? They both should print the same line, but line 320 will print it straight across and quickly, while line 330 will print the line in two halves, and take more time. Then why use line 330 at all? Because when graphics characters get large, they frequently outgrow the ability of the RS232 card to send the characters in one long string. So, line 330 will always print correctly, but line 320 might or might not print properly. Moral: when large graphics do not print correctly, and there do not seem to be any errors in the programming statements, try breaking the graphics codes down into smaller groups.

EPSON Compatible Printer Codes

Printer Action	ASCII codes	Hex codes
Nearly universal codes: (from the TI 99/4A Impact Printer)		
End tabulation instruction	0	0
Sound the buzzer	7	7
Backspace	8	8
Tab (horizontal)	9	9
Line feed	10	0A
Tab (vertical)	11	0B
Form feed (new page)	12	0C
Carriage return	13	0D
Double width to line end	14	0E
Condensed print	15	0F
Select printer	17	11
Turn off condensed printing	18	12
Disable printer	19	13
Turn off double width printing	20	14
Codes that will sometimes vary: (also from the TI 99/4A Impact Printer)		
Set line spacing to 1/8"	27, 48	1B, 30
Set line spacing to 1/6"	27, 50	1B, 32
Disable paper-end detector	27, 56	1B, 38
Select paper-end detector	27, 57	1B, 39
Set line spacing to X/72"	27, 65, X	1B, 41, X
Set vertical tabs	27, 66, data, 0	1B, 42, data, 0
Set page length to N lines	27, 67, N	1B, 43, N
Set page length to N inches	27, 67, 0, N	1B, 43, 0, N
Set horizontal tabs	27, 68, data, 0	1B, 44, data, 0
Turn on emphasized print	27, 69	1B, 45
Turn off emphasized print	27, 70	1B, 46
Turn on double printing	27, 71	1B, 47
Turn off double printing	27, 72	1B, 48
Normal density graphics, where N2 *256 + N1 = number of data sets	27, 75, N1, N2, data	1B, 4B, N1, N2, data
Double density graphics	27, 76, N1, N2, data	1B, 4C, N1, N2, data
Set skip over perforation to N lines	27, 78, N	1B, 4E, N
Reset skip over perforation to 0 lines	27, 79	1B, 4F
Set column width of page to N characters	27, 81, N	
Codes for EPSON printers with GRAFTRAX Plus		
Underline on	27, 45, 1	1B, 2D, 1
Underline off	27, 45, 0	1B, 2D, 0
Italics on	27, 52	1B, 34
Italics off	27, 53	1B,35

GRAPHICS CONVERSIONS

Some of the printer graphics routines I've used in this column print oversized letters. The letters are created by reading the screen character shapes with the CALL CHARPAT statement, and converting those codes to the graphics codes used by the printer. Screen characters are eight dots high and eight dots wide, so they should translate cleanly to printer codes, and usually, they do. These graphics routines were intended to be used with the standard screen font, which has a blank top line. Some TI users are redefining the screen fonts with an assembly routine, and a CHARAI file, to use true descenders on some characters, and so the top line is no longer blank. If you are using HEAD, or HEADER5, or any of the variations of the HEADER subprograms from these columns, and the top line of the characters is missing, try adding this line to the main program.

```
80 CALL CHARSET
```

The CHARSET statement will reset the shapes to the default character set, and the subprogram will work fine.

CABLES

My PC printer can't print labels. I know, it serves me right for buying one of those gosh-darn fool modern contraptions, but I needed to hook up the TI 99/4 Impact Printer to the PC for mailing labels, and the process taught me some useful things about the original TI printer. I'm guessing that TI originally intended for the 4A to be a remote terminal for telecommunications, because the cables are backwards from normal hardware. That comes in handy for connecting a TI to another computer, because just a straight serial cable is needed. Two PCs linked together would need a null modem at one end of the cable. That's a small gadget, between $5 and $12, that swaps the data lines around in the connection, so that each computer can "talk" on the

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sure that the other machine is "listening" on. To hook up the PC to the TI printer, I was successful only when I used a null modem in the connection, combined with 25-pin cables.

Careful, I did NOT say RS232 cables. There is a difference, and they aren't always marked on the packages. 25-pin cables are sometimes called serial extension cables, and all 25 pins are wired straight through. The slightly cheaper RS232 cables use wires on about half the connections, and soldered jumpers inside both cable ends to connect the other pins. They are perfectly adequate for hooking up a PC to a modem, but they will not work for hooking a TI 99/4A to a serial printer, or to a modem. The non-standard TI connections will cause strange things with the cheaper cables. For example, my TI printer, hooked through the cheaper cable, will run a self test all by itself each time it is turned on. Through the 25-pin cable, and an AB switch, and another cable, and TI's own "Y" cable, no problems.

What does this mean to those of you with just one computer? Several things. First, buy the better 25-pin cable, and a null modem, to hook up a modem. No special cable changes will be needed, but watch the ends (Male/Female) to be sure they "mate" up properly. Second, standard serial AB switches are wired through all 25 pins, so PC switches will work fine for TI equipment. Third, to hook up a non-TI serial printer to the TI, use the same routine as for the modem: a 25-pin cable and a null modem. But if there is a PC nearby, maybe with a laser printer, most of these machines have both serial and parallel ports, so if the PC uses the parallel connection, the TI can use the serial, and the switching between the two sources can be done from the printer setup panel by switching between serial and parallel ports. Two warnings if you try this: laser printers and inkjet printers are not Epson compatible unless an extra emulation cartridge is being used. Also, some of the new dual port printers, for example the HP Deskjet 500, will check the ports for connections when powered up, and only one connection will be identified and used. With an auto-sensing printer, its best to use an AB switch for multiple hookups.

I've occasionally received letters about printer translation problems in Extended BASIC. You've just read the solutions to all of the problems I've heard so far, except one. If you've found another problem, you can write me at 1323 Mantle Street, Baltimore, Maryland 21234. I'll do what I can to help.

That one last problem I mentioned is typing accuracy. MICROpendium typesets Extended BASIC and console BASIC programs directly from the disks we programmers send in. The programs are run through CHECKSUM, a program written by Tom Freeman, and published in MICROpendium. CHECKSUM is really two programs. One program adds the comments to the end of each line, like !051. The other should be used by you to type in the programs; it loads into assembly area memory, turns the screen dark blue with white letters, and checks each line as you type it in. If a line is typed correctly, the number the program displays will match the number in MICROpendium's listing. If not, look for a typo. The listings, and complete instructions, are in the October 1987 issue, but there is another way to be sure your listings make it to your computer correctly. You can buy a monthly disk subscription from MICROpendium! For cassette users, you may buy cassette copies of my programs directly from me of any program that does not require disk drives to run ($4. each). I also have special cassette versions of SPRITE BUILDER, CODE TRAINER, and ROULETTE available. Happy Holidays!

MYSTERY

```
90 PR$="RS232.DA=8.BA=4800"
! Default printer name !200
100 ! MYSTERY PRINTER !036
110 ! Prints something:print
er conversion practice, JLS
12/90 !112
120 CALL CLEAR !209
130 DISPLAY AT(1,7):"Mystery
 Printer" !056
140 CALL CHAR(95,"00FFFF")::
 CALL HCHAR(2,9,95,15)!097
150 DISPLAY AT(6,1):"Printer
 name?":PR$ !147
160 ACCEPT AT(7,1)SIZE(-28):
PR$ !119
170 OPEN #1:PR$&".CRLF",DISP
LAY ,VARIABLE 132 !070
180 READ X :: IF X=-1 THEN 2
00 !008
190 PRINT #1:CHR$(X);:: GOTO
 180 !028
200 PRINT #1:"To All TI-99'e
rs and 9640'ers";!096
210 READ X :: IF X=-1 THEN 2
30 !038
220 PRINT #1:CHR$(X);:: GOTO
 210 !058
230 PRINT #1:"Happy Holidays
, and";!180
240 READ X :: IF X=-1 THEN 2
60 !069
250 PRINT #1:CHR$(X);:: GOTO
 240 !088
260 PRINT #1:"On Earth!";RPT
$(CHR$(10),5)!043
270 CLOSE #1 !151
280 STOP !152
290 DATA 27,65,8,13,10 !033
300 DATA 27,68,10,20,0 !026
310 DATA 9,27,75,14,0,0,0,0,
254,190,190,130,190,190,255,
186,130,186,254,13,10 !191
320 DATA 9,27,75,10,0,8,145,
162,124,124,124,162,161,32,2
24,13 !022
330 DATA 9,9,14,27,71,-1 !21
0
340 DATA 13,10,10,10 !091
350 DATA 9,27,76,24,0,0,0,0,
0,0,0,0,1,2,5,9,26,37,106,
148 !017
360 DATA 237,82,45,18,9,5,2,
1,13,10 !045
370 DATA 9,27,76,29,0,0,0,0,
8,16,40,80,168,80,168,88,40,
209,99,151,172 !125
380 DATA 76,183,75,209,32,88
,136,88,168,80,40,16,8 !053
390 DATA 13,9,9,14,-1 !232
400 DATA 13,10,10,10,9,27,76
,31,0,7,8,16,16,16,32,32,32,
32,64,64,64,64,128,129,255 !
241
410 DATA 129,128,64,64,64,64
,32,32,32,32,16,16,16,8,7,13
,10 !009
420 DATA 9,27,76,31,0,224,16
,8,8,8,4,4,4,4,10,18,34,66,1
```

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THE TI-BASE USER'S GUIDE — 7

Program segments

By BILL GASKILL

If you were to catalog the TI-Base program disk you would see a file named OVRLAY/P listed amongst the 20 some files in your printout or display. OVRLAY/P contains the "added features" that TI-Base supports such as CATALOG, CHANGE, CONVERT, COPY, FORMAT, LIST and TRACE and other features that operate as if they are a part of the main program but are not, such as AVERAGE, COLOR, DELETE, MEMORY, PACK, PRINTER, RECALL, SNAP and SUM.

Because the OVRLAY/P file is not maintained in active memory, but is instead read from disk whenever one of the features listed above is called, it must be accessible to the drive that is designated as the program disk (the PRGDISK) drive whenever you try to use it. For multiple disk drive owners this is not a problem since the TI-Base disk will normally remain in the designated PRGDISK drive throughout data management operations. But for single disk drive owners, the need to be able to access OVRLAY/P can be both an inconvenience and a limitation.

A partial solution for single drive owners is to copy the OVRLAY/P file from TI-Base to the data disk. That way you will have access to the file, but you suffer the inconvenience of losing 40 sectors of disk storage in V2.0 AND 70 SECTORS IN V3.0. There are also some limitations that single drive owners must tolerate. These are discussed in the program segment listings below. Where the description states that single drive owners have access to a particular OVRLAY/P feature, it is assumed that the OVRLAY/P file has been copied onto the data disk prior to the feature being "called".

AVERAGE — fully accessible with 1 drive.

CATALOG — fully accessible with 1 drive.

CHANGE — fully accessible with 1 drive.

COLOR — fully accessible with 1 drive.

CONVERT — while the Convert program segment is fully accessible to a single disk drive owner, you must have enough space on a single disk to accomodate the source file and the target file as well as the OVRLAY/P file.

COPY — fully accessible with 1 drive, but only for COPYs from one file name to another file name on the same disk. COPY has no provision for pausing or disk swapping. It also does not use any dynamic memory for buffer space, but instead makes a sector-by-sector clone of the source file.

DELETE — fully accessible with 1 drive.

FORMAT — cannot be used with a single drive. The problem is that FORMAT needs to be accessed at the beginning and end of the disk initialization process. You could begin the formatting by having the OVRLAY/P file on the disk to be initialized, but since it would be erased during the formatting process, OVRLAY/P would not be available to close the operation. The end result would be a "device error" message and a disk that was unusable.

INSTALL — fully accessible with 1 drive.

LIST — fully accessible with 1 drive.

MEMORY — fully accessible with 1 drive.

PACK — fully accessible with 1 drive.

PRINTER — is the PRINTER data base on the program disk. It is fully accessible to the single drive owner if the program disk is inserted before the CALL is made to the PRINTER data base.

RECALL — fully accessible with 1 drive.

RECOVER — fully accessible with 1 drive.

SNAP — fully accessible with 1 drive.

SUM — fully accessible with 1 drive.

TRACE — fully accessible with 1 drive.

EXTENDED BASIC—

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```
29,1,255 !058
430 DATA 1,129,66,34,18,10,4
,4,4,4,8,8,8,16,224 !014
440 DATA 13,9,9,14,-1 !232
```

Funnelweb V4.31 available from group

The Lima 99/4A Users Group has copies of Funnelweb V4.31 available to any individual or user group. Persons or groups may obtain the files by sending disks (four SSSD, two DSSD or one DSDD) and a paid return mailer to the Lima Users Group at P.O. Box 674, Venedocia, OH 45895.

Funnelweb is a fairware operating and utility system for the TI99/4A by Tony and Will McGovern of Australia. It will run on a minimal disk-based system with 32K expansion as an Extended BASIC program (TI or Myarc XBII) or an assembly program file (Editor/Assembler or TI-Writer). It will also run with a Horizon-style auto-booting RAMdisk with any or no cartridge.

The authors note that an extra set of file is available to exploit the extra power of V9938 based systems, the DIJIT AVPC card, the Mechatronics 80-column unit and the Geneve 9640 in GPL mode. The latest system gives some support for hard disk systems using the Myarc Hard and Floppy Disk Controller so Funnelweb can be run from its own directory on the hard disk, leaving the DSK1 emulation file free for use as a work disk.

The 40-column version Disk Review will now do almost everything the 80 column DR will do, according to Charles Good of the Lima Users Group, including sector editing, disk management and file viewing. The 40 column DR will also do file by file disk copying using only a

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TRIALS OF A c99 BEGINNER

More on Roots of a Polynomial

By CHARLES E. KIRKWOOD JR.

The program this month is an improvement for finding roots of polynomials, it will automatically find most, if not all, the real roots. There is less of a probability of converging to a previous root. Years ago when a programmer was challenged when he said that he had a program that would find all the roots of polynomials, replied, "It has found all the roots of the polynomials that I have tried." I can say the same thing for the real roots, but I haven't tried too many.

You only have to input the degree and coefficients (in decreasing powers of x) of the polynomial. Successive roots are found by using reduced equations in the function **newton()**. The successive roots are improved by using the original polynomial coefficients in **newton()**.

The functions **newton()** and **fpoly()** appear in the July issue and I have stored them into file **NEWTON** in my MATH library.

Finding the complex roots is another story. If anyone is interested I will be glad to work on it, just let me know. My address is P. O. Box 1241, Clemson, SC 29633-1241.

```
/*ALL(?) REAL ROOTS OF A POLYNOMIAL*/
#include DSK1.FLOATI
#include DSK1.CONV
#include DSK1.NEWTON
main()
{
  int i,m,n;
  char s[15];
  float a[10][8],p[8],q[8],d[10][8];
  float x[8],r[8],b[10][8],c[10][8];
  float t[8],u[8],v[8],w[8];
  stof("99999",p);
  puts("Input degree of polynomial ");
  n=atoi(gets(s));
  puts("Input coefficients\n");
  for(i=0;i<=n;++i)
  {
    fpget(s,&a[i][0]);
    fcpy(&a[i][0],&b[i][0]);
    fcpy(&a[i][0],&c[i][0]);
    fcpy(&a[i][0],&d[i][0]);
  }
  m=n;
  while(m>0)
  {
    itof(0,x);
    newton(m,b,x,r);
    /*r=approx root,b=reduced eq*/
    if(fcom(r,"!=",p))
    {
      for(i=0;i<=n;++i)
        fcpy(&a[i][0],&c[i][0]);
      newton(n,c,r,q);
      /*q=more accurate root*/
      if(fcom(q,"!=",p))
      {
        puts("\nRoot = ");
        fpput(q,s);
        fpoly(m,d,q,t);
        /*d=more accurate reduced eq*/
        for(i=0;i<=m;++i)
          fcpy(&d[i][0],&b[i][0]);
        /*check for accuracy in*/
        /*original equation, y should*/
        /*equal zero (0)*/
        for(i=0;i<=n;++i)
          fcpy(&a[i][0],&c[i][0]);
        fpoly(n,c,q,t);
        puts(" Check y = ");
        fpput(t,s);
      }
    }
    else
```

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BASIC/Assembly

Redefining character definitions

Taking advantage of the speed of assembly

By BARRY TRAVER

As you know from earlier columns, I believe that BASIC is not only the best-known all-purpose language around but also still the best all-purpose language around, and entirely suitable for most tasks. There are a few circumstances, however, where BASIC can use a little help from assembly, either because it can't perform what is needed to be done or because it performs it too slowly.

One of the things that BASIC does not do well is redefine characters. Last time we showed you how to redefine characters (and color sets) that XBASIC does not let you redefine; this time we'll show you another way to redefine characters, although our focus now is on a different aspect: the speed rather than the power of assembly.

If you have lots of characters to redefine in the normal range of ASCII 32 to 143, Extended BASIC does let you redefine them, but it can take quite a long time to do. Here's an instance of something that XBASIC can do, but takes its time doing, more time perhaps than you find acceptable.

If we had a full-fledged BASIC compiler for the TI, that would be one solution to the situation. Since we don't, however, we can solve the problem in another way: using a CALL LINK to an assembly routine that can refine any or all characters in the range of ASCII 32 to 143 and do it instantaneously.

We'll assume that you've already written the relevant CALL CHAR statements in XB. We'll also assume that you want to convert them to an assembly equivalent, but that you want to do it the lazy way, i.e., by letting the computer (using an XB utility) do all the work of writing the assembly source code for you.

FONTALS V2.0

Yes, Virginia, there are XB programs that write assembly source code. I've written quite a few myself, e.g., GRAPHICOMP, VDP/SAVER, and FONTALS (all to be found in the Genial TRAVelER, a diskazine for the TI-99/4A). FONTALS (as the name implies) is designed to put a FONT into Assembly Language Source. An earlier version (Version 1.0) was published in Vol. 2, No. 4 of GT, but MICROpendium has the privilege of being the first to publish a much-expanded version (Version 2.0) of this MERGE utility.

By the way, don't let the name FONTALS mislead you. FONTALS can be used to redefine not only a ASCII font of alphanumeric characters, but also ASCII characters used for fancy screen graphics displays. In fact, I expect that is where the program will find its most extensive application.

Here's how FONTALS works: you redefine characters in the usual way in XB, i.e., using CALL CHAR, and FONTALS uses CALL CHARPAT to get the data it needs to write the assembly language source for the characters desired. It's not much more complicated than that.

Version 2.0 of FONTALS has three advantages over version 1.0: (1) it writes more efficient code (requiring less memory), (2) it allows you to read the resulting source code on the screen

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c99—

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```
    {
      if(n==2)
        puts("\n\nNo REAL roots\n\n");
      else
        puts("\n\nNo more REAL roots\n\n");
      m=1;
    }
    m=m-1;
  }
}
```

BASIC/Assembly—

(Continued from Page 20)

as it is being created, even if it's creating code to redefine capital letters, numbers, etc., and (3) it allows you to pick and choose ranges of characters you want defined (for example, instead of redefining ASCII 48-126, you can redefine 48-57, 60-62, 65-90, 94, 97-122, and 126, if those are the only characters you want redefined).

To make FONTALS as easy to use as possible, it is a MERGE utility designed to be MERGEd into an existing XB program. (Incidentally, you can use FONTALS to improve programs other people have written as well as your own, but more about that in a moment.) If you have the MICROpendium disk for this issue, you don't need to type in FONTALS: it's already all ready there for you to use. If you're typing it in yourself, do so just as if it were a normal XB program, but when you're ready to SAVE it to disk, enter the following:

SAVE DSK1.FONTALS,MERGE

That will save it as a DIS/VAR 163 file instead of as a normal XB program.

The strange line numbers in FONTALS have been chosen so as to avoid competition with line numbers in XB programs with which you may want to use FONTALS. If we had used more "normal" line numbers for FONTALS (100, 110, etc.), it is likely that important lines in your regular XB program might be lost (i.e., overwritten) when FONTALS was MERGEd with your XB program. (In my own copy of FONTALS, in fact, I even made my first line to be line 0 rather than line 1! If you know how to do that yourself, go ahead, although it's not really that important.)

How do you use FONTALS? Here's the procedure. Let's assume that your XB program is DSK1.PROG and that in your XB program your last CALL CHAR statement to be executed in redefining characters is line 240. Here's what you need to enter in XB to create the source code for your CALL LINK:

OLD DSK1.PROG <Enter>
MERGE DSK1.FONTALS <Enter>
241 CALL FONTALS :: STOP <Enter>
RUN <Enter>

The only "hard" part is to insert the line CALL FONTALS :: STOP immediately after the last character definition. (I used 241 because in this example I said that the last CALL CHAR was in line 240, and line 241 is the next possible line after line 240, but you'll have to decide from your particular XB program exactly where you want to insert CALL FONTALS :: STOP.)

When the program is running, you'll be prompted to enter some information. Let's suppose you want to have the assembly routine redefine characters 48-57, 60-62, 65-90, 94, 97-122, and 126. Let's also assume that you want the CALL LINK name to be "MYDEFS" and that you want the resulting source code file to be DSK2.DEFS/S. Here's what you would enter while the program is running:

48 <Enter> 57 <Enter>
60 <Enter> 62 <Enter>
65 <Enter> 90 <Enter>
94 <Enter> <Enter>
97 <Enter> 122 <Enter>
126 <Enter> <Enter>
<Enter>
MYDEFS <Enter>
DSK2.DEFS/S <Enter>

The program is fairly friendly, so if you want to define (as here) the single character 94, you can do either 94 <Enter> <Enter> or 94 <Enter> 94 <Enter> (since the "range" for this part is "from 94 to 94"). The program allows over a dozen "ranges" to be defined, so that should ordinarly be sufficient for any normal situation.

After the source code is created, use the Editor/Assembler (or some reasonable equivalent) to assemble it. For this example, let's say that we assemble DSK2.DEFS/S to create DSK2.DEFS/O. At this point there are two ways to make use of the assembly character definition routine you have created using FONTALS, both of which eliminate the CALL CHAR statements needed earlier and replace them with a simple CALL LINK. In the specific example I'm using, the CALL LINK will be CALL LINK("MYDEFS").

The older way (which I don't recommend) is preceding your CALL LINK with a CALL INIT and a CALL LOAD("DSK2.DEFS/O"), something like this:

CALL INIT :: CALL LOAD("DSK2.DEFS/O"):: CALL LINK("MYDEFS")

The problem with this approach is that it may take as long for the computer to perform the CALL LOAD("DSK2.DEFS/O") as it would have taken to perform the original CALL CHAR statements in the first place! The newer way is to use Todd Kaplan's public domain ALSAVE utility (see MICROpendium, September 1990, pages 17-19) to embed the assembly routine right in your XB program. (A similar approach would be to use Barry Boone's fairware utility SYSTEX.)

Using ALSAVE (or SYSTEX) to hide assembly routines within XB programs is a technique used by many commercial TI software companies, including Asgard Software, COMPRODINE, Genial Computerware, JP Software, and Notung Software, just to name a few companies of which I have personal knowledge. If this is the way the professionals do it, I highly recommend that you learn how to do it as well. The procedure is not complicated, and it can radically improve your XB programs!

I mentioned earlier that you can use utilities like FONTALS, GRAPHICOMP, VDP/SAVER, etc. to improve not only your own XB programs but also XB programs written by other people. That's exactly what I did recently with over three dozen Sam Moore "classics" (presumably public domain) originally written in the early 1980's. The music is still great, but the slowness of the creation of some of the graphics detracted from the programs. I eliminated that problem, however, by using GRAPHICOMP and VDP/SAVER (which includes similar code to FONTALS) to write code to redefine characters and create the initial screen instantaneously. (I suspect that Sam Moore would have done something similar, if he were still involved in writing programs for the TI community today.)

Again, few tasks are slower in XB than redefining characters

(See Page 20)

BASIC/Assembly—

(Continued from Page 19)

using CALL CHAR. (The only thing I can think of at the moment that comes close is the READing of DATA, something I may address in some future article.) With the help of FONTALS, you can redefine a multitude of characters in a fraction of a second. (Contained on the MICROpendium disk is a true-lower-case SAMPLEFONT program that you may like to try out with FONTALS.) I hope that you find this FONTALS utility useful in your own XB programming!

Technical note: note that - although no parameters are passed on to FONTALS - FONTALS is able to know whether it is being accessed for the first time or a second time, since the value of S is changed as a result of the first access. (Unless instructed otherwise, numeric variables in XB start out with a value of 0.) Originally for version 2.0 of FONTALS I had written two different subprograms, SETUP and FONTALS, but passing parameters was a hassle: instead of a simple CALL FONTALS, you had to do a CALL FONTALS(N,DF$(),F(),L()) (and CALL SETUP was similarly complicated). Accessing the same subprogram twice (and using different sections of that subprogram) eliminated the need to pass along any parameters (because they were already there!).

Traver publishes a diskazine for TI users called Genial TRAVelER. He can be reached at 835 Green Valley Dr., Philadelphia, PA 19128.

FONTALS V2.0

```
1 CALL FONTALS ! (The first
CALL FONTALS sets things up;
 insert a CALL FONTALS :: ST
OP after the characters are
redefined!) !212
32600 ! COPYRIGHT (C) 1989,
1990 by Barry Traver, 835 Gr
een Valley Drive, Philadelph
ia, PA 19128 (phone: 215/483
-1379). !010
32601 SUB FONTALS :: IF S TH
EN 32614 !062
32602 DIM D$(143),F(13),L(13
)!240
32603 DISPLAY AT(1,5)ERASE A
LL:"FONTALS, VERSION 2.0":"
 COPYRIGHT (C) 1989, 1990":"
    BY BARRY A. TRAVER" !15
6
32604 DISPLAY AT(5,4):"FIRST
 CHAR   LAST CHAR":TAB(5);"T
O SAVE      TO SAVE" :: R=7
!184
32605 ACCEPT AT(R,7)VALIDATE
(DIGIT," ")SIZE(-3):F$ :: IF
 F$="" THEN 32608 ELSE N=N+1
 :: F(N)=VAL(F$):: IF F(N)<3
2 OR F(N)>143 THEN 32605 !03
9
32606 ACCEPT AT(R,20)VALIDAT
E(DIGIT," ")SIZE(-3):L$ :: I
F L$="" THEN L$=F$ !159
32607 L(N)=VAL(L$):: IF L(N)
<32 OR F(N)>143 THEN 32606 E
LSE R=R+1 :: GOTO 32605 !246
32608 R=R+1 :: DISPLAY AT(R,
1):"CALL LINK NAME?  CHRDEF"
 :: ACCEPT AT(R,18)SIZE(-6):
P$ !003
32609 R=R+2 :: DISPLAY AT(R,
1):"OUTPUT FILE? ":" DSK" ::
 R=R+1 !216
32610 ACCEPT AT(R,2)SIZE(-27
):F$ :: ON ERROR 32611 :: OP
EN #1:F$,OUTPUT :: ON ERROR
STOP :: GOTO 32613 !202
32611 ON ERROR 32612 :: CLOS
E #1 :: ON ERROR STOP :: GOT
O 32610 !017
32612 RETURN 32610 !050
32613 CALL CLEAR :: S=1 :: S
UBEXIT !135
32614 FOR J=1 TO N :: FOR I=
F(J)TO L(J):: CALL CHARPAT(I
,D$(I)):: NEXT I :: NEXT J !
142
32615 CALL DELSPRITE(ALL)::
CALL CLEAR :: CALL CHARSET :
: CALL SCREEN(5):: CALL COLO
R(1,16,1,2,16,1,3,16,1,4,16
,
1,5,16,1,6,16,1,7,16,1)!194
32616 CALL COLOR(8,16,1,9,16
,1,10,16,1,11,16,1,12,16,1,
1
3,16,1,14,16,1)!099
32617 PRINT #1:"* SOURCE COD
E CREATED BY FONTALS, VERSIO
N 2.0":"* COPYRIGHT (C) 1989
, 1990 BY BARRY A. TRAVER":"
" !146
32618 FOR K=0 TO 1 :: PRINT
#K:TAB(8);"DEF  "&P$:"":"BAS
IC  EQU  >006A":"GPLWS  EQU
 >83E0":"VMBW   EQU  >2024":
"" :: NEXT K !064
32619 FOR K=0 TO 1 :: PRINT
#K:P$;TAB(8);"B    @P"&STR$(
F(1)):"" :: NEXT K !070
32620 FOR J=1 TO N :: FOR I=
F(J)TO L(J):: A$=D$(I)!022
32621 A$="DATA "&">"&SEG$(A$
,1,4)&",>"&SEG$(A$,5,4)&",>
"
&SEG$(A$,9,4)&",>"&SEG$(A$,
1
3,4):: IF I<128 THEN A$=A$&"
  "&"* "&CHR$(I)!096
32622 FOR K=0 TO 1 :: PRINT
#K:"D"&STR$(I);TAB(8);SEG$(
A
$,1,21);SEG$(A$,22,12):: NEX
T K :: NEXT I :: NEXT J !247
32623 FOR J=1 TO N :: FOR K=
0 TO 1 :: PRINT #K:"":"P"&ST
R$(F(J));TAB(8);"LI   R0,"&S
TR$(768+8*F(J)):TAB(8);"LI
 R1,D"&STR$(F(J))!178
32624 PRINT #K:TAB(8);"LI
R2,"&STR$(8*(L(J)-
F(J)+1)):T
AB(8);"BLWP @VMBW" :: NEXT K
 :: NEXT J !019
32625 FOR K=0 TO 1 :: PRINT
#K:"":TAB(8);"LWPI GPLWS":TA
B(8);"B    @BASIC":"":TAB(8)
;"END":"" :: NEXT K :: CLOSE
 #1 !153
32626 SUBEND !168
```

BBS operates in Colorado

The Rocky Mountain 99ers BBS, located in Boulder, Colorado, may be reached 24 hours a day at (303) 442-2708. It operates at 300, 1200 and 2400 baud, 8N1. Curt Heckert is the sysop.

Getting more TI's out of the closet depends on the human interface

By RANDY A. COOK

The scenario is a common one. After buying a Texas Instruments 99/4A computer from the bargain table at a garage sale, the proud new owner begins the search. He or she goes into the local software store to browse at the available titles. He looks through the seemingly endless shelves of IBM, Apple and Nintendo programs to find what software is for his TI computer. After a futile search, he turns to the sales clerk for assistance. Some are polite, and some sarcastic. Others didn't know that Texas Instruments made computers. This potential customer then leaves the store with the misguided opinion that no software exists for the TI machine, and that maybe it wasn't such a bargain after all.

As a reader of MICROpendium, you know this to be untrue. However, to the large number of second-hand TI owners who know nothing of the supporting TI community, this negative idea is the only logical conclusion.

Knowledgeable computer users must correct this view. With a little determination and effort, the average TIer can make a difference.

Go to that local software store and talk with the clerk or owner. Realistically, it should be understood that you are not going to convince them to stock TI merchandise, unless of course you happen to be an exceptional salesperson. You might, however, get the store to direct those "lost TIers" to a reliable company or person who does have information on the TI. It has been my experience that most store owners will happily assist local users and user groups in publicizing and contacting the owners of specific computer types (even if they don't sell that brand). Mention the fact that the TI 99/4A uses 51/4 diskettes, just like the IBM and Apple. Many popular printers, monitors, and joysticks (for those owners of the Atari adapter) will also work with the TI. A printer requires ribbons and fanfold paper regardless of the computer it is attached to. An informed store owner will recognize the potential sales that are possible without the need to stock a single TI specific product. It is to their advantage to help you.

It has been my experience that most store owners will happily assist local users and user groups in publicizing and contacting the owners of specific computer types (even if they don't sell that brand).

Another suggestion would be to advertise. Other groups do this, and the expense is minimal. A small classified ad in your local paper can draw a number of lost TIers out into the open. To those who respond, you can give the name and address of a few mail-order retailers to contact. A photocopied list of suppliers would give a concrete connection to the rest of the TI community. An example of an ad might read: "For information on finding TI99/4A software/hardware, contact John Doe at (123) 456-7890" The cost of 13 words at 25 cents per word comes to a total of $3.25 (rates based on my own local paper).

But the best source for locating TI owners is through personal contacts. The number of TI 99/4As surrounding you might come as a surprise. With 2.5 million units sold, TI computers can be found in some very unlikely closets. Your job as a dedicated TI enthusiast is to clean those closets and prompt the owners to dust off that console and start making use of this powerful machine.

Keep your eyes and ears open. When you spot a familiar black and silver console, offer to help them with both your experience, and any public domain software that you might have. Be sure to tell the computer owner about the great software titles and hardware expansions that are now available. Give them information on mail-order retailers and of magazines like MICROpendium.

To convince them that thier TI 99/4A is a better value than any video game machine or other more expensive computers, compare the $9.95 price tag of Atarisoft's Donkey Kong (price from Tex-Comp), to Nintendo's price of $44.99 or Atari's 7800 version for $24.99. (prices from Sears) Or any other piece of arcade, educational, or business software. Informing the public is the key.

We already know that the Texas Instrument 99/4A computer is still a great value, and has a promising future. Let the rest of the world know it too.

Cook is a TI user in Parsons, Kansas.

UK users offer foreign memberships

The TI99/4A Users Group (U.K.) invites all 4A owners to join, according to Stephen Shaw, vice president and disk librarian for the group. He says the 8-year-old group has approximately 150 members, most in the United Kingdom. About half the membership have unexpanded systems, according to Shaw.

Membership, which includes a quarterly publication, is !15 Sterling seamail or !18 airmail. Payments are preferred by a sterling money order or bank draft drawn on a UK bank, Shaw says, but the group is able to accept currency notes to the following values, which include exchange costs:

Australian $40 seamail, $50 airmail
French Frl50 by Standard European Mail
German DM45 by Standard European Mail
United States $30 seamail, $36 airmail.
No currency checks can be accepted.

Persons wishing to join should write the membership secretary: Peter Walker, Esq., 24 Bacons Dr., Cuffley, Potters Bar, Herts., England EN5 4DU.

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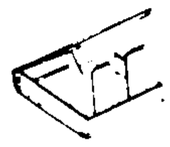

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#23. WILL WRITER
Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but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

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

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

#26. R RATED GAME
It was bound to happen. A talented (but demented) programmmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 18 to order this one!!

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

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

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

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

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

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

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

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

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

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

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

#38. GREAT 99/4A GAMES VOL. I
A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II
Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

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

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

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

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

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

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

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

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Gen-Tri for the Geneve

Wayne Stith outlines status of multi-function program

The following is an edited transcript of a conference held on GEnie in November with Wayne Stith, developer of Triad and other programs. The subject of this conference was Gen-Tri (pronounced gen-tree) for the Geneve. Pricing and release dates of the program have yet to be set by JP Software, which will market Gen-Tri.—Ed.

Several years ago I released Triad, a program for the 4A which provided a terminal emulator, an editor and a disk manager in one memory-resident package. The program was approximately 19K in length. Although the program would function on the 9640, it really didn't take advantage of the capabilities of the machine. Almost immediately I began to tinker with the program, but soon decided that a complete rewrite would be necessary. In the next few weeks JP Software and I will be releasing a new version designed specifically for the 9640. The new name will be Gen-Tri.

Like its predecessor it contains the same basic elements: A terminal emulator, an editor and a disk manager. But since the program occupies over 200K of memory, it contains considerably more than Triad.

The terminal emulator contains several new protocols, one of which has never appeared in the Geneve community: CISB+, IKXMODEM, and YMODEM batch, as well as the usual XMODEM and ASCII routines. In addition, the binary protocols allow the user to include or omit the (Paul) Charlton header on DIS/FIX 128 files, thus providing a greater degree of compatibility with other computers. You may transfer files to or from a floppy disk, a hard disk, a RAMdisk or a large buffer set aside in the program specifically for file transfers. A hook has also been provided that will allow the use of external protocols. Such a protocol may be loaded automatically when the program is booted.

The usual features of TI terminal emulators have been included, such as buffer dumps, elapsed time clock, etc. There is also an autodialer and a macro handler. Perhaps the most unique feature is the script routine. You may design a logon script or perhaps a menu of services. You can even download files automatically. It is also possible to invoke a script as a macro. Scripts can be in source or compiled form and may invoke other scripts. The script language is intuitive and easy to use.

The disk manager is primarily a floppy disk manager. I don't want anyone to get the idea that this is an exact replacement for the Myarc DM. You cannot format a hard drive, nor set up an emulate file, nor make a disk backup, nor do directory-related work. However, you can perform the customary file operations on your hard drive.

The disk manager has a couple of nice extras, such as the capability of copying groups of files (all DIS/FIX 128 files, for example), and a unique file recovery routine which gives the user the option of specifying the file to recover or allowing Gen-Tri to try to find lost files on its own.

I have tried to make the WP as close to MY-Word as possible, hence the existence of fixed mode (either overstrike or insert) and the standard word wrap overstrike modes. However, I have replaced the TI split line insert mode with true word wrap, that is, when you type, the text moves to the right and the paragraph reformats as you go.

Triad originally had a fixed mode editor which was adequate for making short notes or reviewing the terminal emulator text buffer. Gen-Tri's third portion is a more fully developed word processor. The buffer is large enough to support nine documents in memory simultaneously. Text may be blocked in one document for inclusion in another. Formatting and tabs specifications travel with the document and can be different for each of the nine. I have tried to make the WP as close to MY-Word as possible, hence the existence of fixed mode (either overstrike or insert) and the standard word wrap overstrike modes. However, I have replaced the TI split line insert mode with true word wrap, that is, when you type, the text moves to the right and the paragraph reformats as you go.

Gen-Tri will load DIS/VAR 80, DIS/FIX 8, and D/F 128 documents as well as those in its native format. Documents may be printed to the screen, to the printer, or to disk in either D/V 80 or D/F 128 formats. An external dictionary will be provided that will check either a single word or an entire document with a single keypress. A special solution to the CNTL-U problem has been devised which allows you to create printer macros and store them within the text without having to see them on screen unless you want to. You may create a script file for the terminal emulator and compile it while in the word processor.

Gen-Tri includes a shell feature which will allow the user to leave the program, access the Editor/Assembler cartridge to run other programs or even assemble code, and then return to Gen-Tri.

The code for Gen-Tri has been completed and extensive debugging is proceeding.

Q&A

Q. How large of a transfer buffer does it have?

A. Around 100K, and a 24K text buffer (TE mode).

Q. Is there any hope for a 99/4 version — perhaps with use of a 9938 device and RAMBO Horizon?

A. Yes, the proverbial snowball's hope! The problem in porting it backwards to the 4A is that I do some strange memory paging. I don't know the ins and outs of the RAMBO, but if it operates out of the >4000 space it would be a tremendous amount of work to recode it for the TI.

Q. It operates out of cartridge (>6000) space.

A. Still a problem. I need to page stuff in and out of the >0000, the >2000, the >4000 and the >A000 space. There is a small chance that what you have in mind might be done. Peter Hoddie and I have talked this idea over, but right now I just

(See Page 28)

GEN-TRI—

(Continued from Page 27)

don't have the time to recode for another device. The theory would be that a master memory monster would handle all memory access on the large scale — the user would then be responsible for typing in the list of memory devices he has available. For example, he could say that the code for the word processor would be located in the RAMBO or on disk, whatever. Gen-Tri would be blind to where it is getting its info, but even here there are problems, as there are certain things which simply MUST reside in pageable memory. I've always had the notion that if the Horizon (even in its original configuration) were used to its potential we could have some really nice software for the 4A.

Q. What does scripting do?

A. The script thing — for those who have never used a script on a clone — allows you to automate your communications. You can set up a menu, select baud rate, port, etc. dial up a service, tell it to feed you messages, go into a library and automatically download files. I've only tried automatic file transfers a couple of times, just to see if it works, and so far, it does.

The language is similar to TI BASIC, with GOTOs, GOSUBs, and easy to understand syntax. For example, SET BAUD 2400 would be all you need to set the baud rate to 2400. You can type your script in the WP and have it compiled there so that there will be no wait for compilation when you go online. The TE will handle source and object scripts.

Q. What are some features of terminal emulator?

A. The TE will allow you to have a bunch of macros, which can include script names so you don't have to type in a script filename every time you want to use it. There is a hook in the terminal emulator so that other authors can write protocols that Gen-Tri will run.

Q. What about the word processor?

A. The program includes an external dictionary (by J. Peter Hoddie) which allows you to check a word on a floppy i about 1 second, maybe 2, and will chec an entire document for you. Right now a it does is check a word that is passed to i There are no provisions for changing document.

Q. What is the current status of debu ging of Gen-Tri?

A. The DM and the TE are not bugg The WP is still undergoing debuggin There is only one bug in the TE, and th is a display glitch, does not affect the o eration of the program (is minor and ra anyway). I use the DM and TE all the tim (except tonight!) and they work well. Th WP was just finished last week, so natura ly it still has some roaches.

Q. What is your next project?

A. I have in mind a down and dirty har drive backup, fairware probably. It woul be extraordinarily simple. Don't know if will ever get to it though.

JP Software can be reached at 101 Pine St., Menlo Park, CA 94025; 415 328-0885.—Ed.

MDOS .97H offers flexibility when using variety of commands

The following information, posted on GEnie, is by Paul A. Dam, a member of the Miami User Group. We're publishing an edited version here because we find the information to be useful and so should many Geneve users.—Ed.

Here is a list of command line arguments in MDOS:

Directory
DIR A:
or DIR DSK1.(drives are may be designated with letters or numbers)

All of these parameters can be used with most commands and have been tested with MDOS .97H (with and without a hard drive controller). Substitute the command you want to use where you see CMD.

CMD 'dv or 'DV	(Display Variable 80 files)
CMD 'v or 'V	(Display Variable 80 files)
CMD 'df or 'DF	(Display Fixed)
CMD 'if or 'IF	(Internal Fixed)
(char) CMD 'i or 'I	(Internal Fixed)
= CMD 'd or 'D	(Display Variable and Fixed)
character CMD 'if or 'IF	(Internal Fixed)
CMD 'i or 'I	(Internal)
CMD 'f or 'F	(Fixed)
CMD 'p or 'P	(Program)
CMD 'r or 'R	(All main directories on floppy or hard drive
CMD '1 to '#	(Any file w/length of 1 to #
CMD '(Unused Char)	All files except main directories on Hard drive
CMD ? to ?????????	(All 1 up to 10 character filenames
CMD (char)? or ?(char) or (char)?(char)?, etc	
CMD A??	(All files with 3-character long nam starting with the letter A
CMD *	(All files, wild card character
CMD *S	(All filenames that end in S
CMD A*	(All filenames that begin with A

EXAMPLES

DIR A:'DV/W	(Directory A: all Display Variable file display a wide list to the screen
DIR A:S*/P	(Directory A:All files that start with S and pause at the end of each page
CMD >	(Redirection command

TYPE README > FILENAME or > PRN or > RS232/1
COPY README > PRN
DIR A: > FILENAME or > PRN
DIR (Directory a disk
COPY COPY A:FILENAME COPY CON FILENAME COPY

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MDOS TIPS—

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D:
COPY CON FILENAME (Copies From Keyboard; pressing Ctrl Z saves to filename)
COPY A: D: (Copies drive A to drive D)
ECHO ON or OFF (Turns on/off display of batch commands)
TIME (Displays time and prompts for change)
DATE (Displays date and prompts for change)
PROMPT (Sets prompt $g)
TYPE (Type file to screen (TYPE A:README)
RENAME REN (Rename a file; REN A:FILENAME NEWNAME)
DELETE DEL (Delete a file; DEL A:FILENAME)
ERASE (Erase a file; ERASE A:FILENAME)
ATTRIB (DSK#) (List files and protection status)
ATTRIB + or - (+P Protect -P Unprotect; ATTRIB +P FILENAME)
CHKDSK (Check disk status)
DISKCOMP (Compares two disks and returns status)
PATH (Lists the path MDOS will follow looking for a filename)
MAKEDIR MD FILENAME (Makes a directory on hard drive or floppy)
MD (up to 125 on a hard drive or 3 directories on a floppy)
TREE (Displays the tree structure of your disk)
PATH A:;B:;HDS1:;HDS1:DSK1 (Sets the path for MDOS to follow)
FORMAT (Format a disk; FORMAT A:/V/2/18)
V=VOLUME name; 2=DSDD 1440 sectors 18=18 sectors per track; 1=DSSD 720 sectors; 16=16 sectors per track
GETKEY (Barry Boone's GETKEY program)
IF (IF %1==A DIR A:)
(IF %1==B COPY A: D:)
(IF EXIST A:DSKU1 COPY DSKU* D:)
FOR FOR %%D IN (A: B: C: D:) DIR %%D (This would run a directory of the drives a: first B: second, etc.)
GETSTR A: B: C: D: F: G: H: etc. (GETSTR is by Barry Boone)
FOR %%D IN (%1 %2 %3 %4 %5 %6 %7 %8 %9) COPY %%D E: (This would copy all files on the above drives to my hard drive E:)

Redirection > will work with most MDOS commands.

The Myarc Geneve manual and an IBM DOS manual will cover most of the commands available. Some of the Geneve commands work a little differently than the IBM commands, but the similarities will help in learning the MDOS environment. Experiment with the different commands and you will learn a bunch.

SYSTEM/SYS VERSIONS

There has been a lot of confusion about the different versions of MDOS and changes made in each. Users didn't know what would work from one version to the next. Programmers were continually trying to keep up with the changes to the point of frustration. Well, I feel that is about to change. I may be wrong, but after 3 years of using the Geneve the most recent version of MDOS .97H, is standing good ground. It handles most of the commands and even upon copying too many sectors to my Horizon RAMdisk it did not wipe it out or distort any files or lose the ROS. MDOS .97H doesn't support MDMV, and other than formatting a hard drive I do not miss MDMV. John Johnson's Boot program will run a directory of a hard drive and run and delete files, and MENU80 V2.5 will copy up to seven file names, more using the wildcard character (*). COPY M* will copy all files that start with the letter M.

I have used all the commands listed in this article successfully with MDOS .97H

What SYSTEM/SYS version should you use and how to use it? The most recent version, .97H, works with and without hard drive systems. MDOS1.14F and .97H are beta test versions and have bugs. Version .97H does support the HFDC to control and format floppies. MDMV will not work with .97H but has most MDOS commands working. I would like to see the Attrib command work like it does with MSDOS so we could use it to set a marker to copy files from a hard drive. Most MDOS commands work with the hard drive. There is a problem formatting drive A: with another disk manager program, or ARC303. (ARC303 is Barry Boone's archiving program.) Unarcing a file from drive A:. This happens with the HFDC controller, the TI and Myarc floppy controllers work with 97H, DSKU and ARC303.

Other than this, .97H seems very useable. MODE 40 or MODE 80 blanks the screen (do a Ctrl C to return). I have removed MODE80 from my batch files and AUTOEXEC to prevent this. The system defaults to 80-column mode. MDOS .97H accesses my Horizons, and ARC303 works with them as well. So I copy any ARCed files from DSK1 to a Horizon, then I unarc it to RAMdisk and save it to DSK1 as a backup. Hopefully this will change with the next version.

SYSTEM/SYS 1.14F has many bugs and I do not recommend using this version. Earlier versions of 1.14F, such as MDOS 1.14C, are stable, although not without bugs. At present 1.14C is necessary to run MDMV to format hard drives, as far as I know it is the only MDOS version that allows MDMV to format hard drives. (1.14C is frequently known simply as 1.14—Ed.)

I have used .97H on a system without a hard drive, and it works great. All the commands seem to work fine with floppies. I have tested it with a Myarc DSDD disk controller and a TI disk controller. It does have problems with the HFDC hard drive controller accessing DSK1. I do not have a second floppy on my system, but it may have the same problem. It does access the drive fine in MDOS, and copies well, it is with use of ARC303 or DSKU that it comes up with errors. Also MODE 80 or MODE 40 works but blanks the screen. Other than that it has been stable and a pleasure to use. Most of the bugs from other versions of MDOS seem to be eliminated from .97H. If you can make room for 481 sectors of MDOS then this is for you. (Other versions of MDOS excluding the "H" series can be used on a single-sided,

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MDOS TIPS—

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single-density disk.—Ed.)

I recommend MSOS .97H for both a hard drive system and a floppy only or Horizon system.

Regardless of the system setup I recommend MENU80 Ver 2.3 or above to ease the use of the Geneve. Version 2.5 has a phone book thanks to John Johnson and copies files to the hard drive. It has also been speeded up and shortened from the first versions of MENU80. Barry Boone's GETKEY, GETSTR and EXEC programs are a must for MENU80.

I also recommend John Johnson's XUTILS, FIND, BOOT, SHOWCOLOR, SETCOLOR and REMIND programs. I use them throughout MENU80 and they make computing a pleasure.

Joe Cavalieri has a nice set of programs out for the MDOS environment, I recommend these programs for file manipulation and study guides for potential c99 programmers.

Clint Pulley has contributed a bunch to the MDOS environment, including QDE and the c99 programming environment, these files are a must for c programmers.

WHAT ABOUT HORIZON RAMDISKS?

What version of RAMDOS should you use with Horizons and the Geneve? If you use 1.14C, then use the RAMDOS for that system configuration. If you use .96H or 1.14F or .97H, then use RAMDOS1.14F. GPL 1.04 is reliable and is used with 1.14 - .97H.

To use the HFDC with a 800K Horizon you must set the DIP switches on the HFDC card to the proper settings. I set drive 1,2 and 3 to 360K with the fastest disk access. I set DSK4 to 1.4 megabytes. This allows the HFDC to work properly with the 800K Horizon. The address DIP switch should be set at >1100 for the HFDC to control the floppies, >1000 otherwise.

You may have slower or smaller floppies, follow the Geneve manual on this one.

Use James Schroeder's RAMDOS (LHDROS) to load SYSTEM/SYS on your Horizon, and use the CFG file to configure any other Horizons. Follow the docs.

SAMPLE AUTOEXEC FILE

What should be in it? Heres mine:

COMMAND	RESULT
ECHO OFF	Turn off ECHO
CLS	Clear screen
ASSIGN F=DSK6:	Assign F to Dsk 6; putting this here prevents a search of drive A: or DSK1
F:	F: is assigned toprevent.searching drive A
GETSTR TIMODE	Gives me the option to blank
%1	it out with space bar, or press enter and it is declared with %1 here
SETCOLOR 5 1 1 3	Set color 5(Blue) 1 1 7 Light Blue to 1 1 3 Dark Blue
MODE B5	Set B Background to color Blue 5
MODE F15	Set F Foreground to color Gray 15
ECHO RAMDISK	This gives me the option to set my
GETSTR 120	RAMdisk size on the fly, Just type over 120 or blank it out for no RAMdisk
RAMDISK %1	Set RAMdisk to %1
FIXRAMDISK	Loads file to fix RAMdisk
MODE PIO:132	Set printer to 132 column
MODE RS232:1200	Set RS232 to 1200 Baud
LASTDRIVE = I	Set last available drive to I
ASSIGN D=DSK5:	Assign commands
ASSIGN E=HDS1:	HDS1=My hard drive #1
ASSIGN G=DSK7:	This is my 256k Horizon
ASSIGN H=DSK8:	This is my 800k Horizon
ASSIGN I=HDS2:	HDS2=2nd hard drive
PATH F:;G:;H:;E:;E:DSK1;I:;I:DSK1;	Set the path for file search
RAMDOS	This is RAMDOS 1.14F allows access to all Horizons
SETCOLOR 15 5 5 5	Set the Gray darker to ease the eyes
PROMPT $N:$P	Set the prompt $N drive Letter, $P subdirectories
H:	Set default drive to H:
MM	run MENU80 file

ADVANCED BASIC

Myarc BASIC 2.99A must be loaded through 1.14F or .97H only. (Earlier versions of MBASIC including 2.99 are loaded through MDOS .96H or 1.14—Ed.) It has run the majority of their Extended BASIC programs. It is necessary to include a CALL GRAPHICS (1,1) in the beginning of the program for MBASIC to run the proper graphics setup .

HFDCC setup.

MONITORS

An RGB analog monitor is necessary to get full advantage of the Geneve graphics display capabilities. I use a Commodore 1084 RGB analog, color composite monitor, $325 new. But any analog RGB monitor with a resolution of 512x212 or greater with sound speaker will do.

HARD DRIVES

This goes for TI as well as Geneve users, only buy MFM (Mixed Functional Module) drives. It is important to get MFM hard drives that are ST506 compatible. The HFDC will not support RLL (Run Length Limited) hard drives.

CONCLUSIONS

MDOS 1.14 and .97H are highly recommended. If possible use only these versions and hide all other versions. Also use only MBASIC 2.99A as it is much closer to being a finished product than previous versions, including 2.99. If you have only a SSSD drive system and no Horizon RAMdisk, you will have to use an MDOS that requires 358 sectors (1.14), but I strongly recommend the purchase of a Horizon RAMdisk for booting and storage purposes. However, at least upgrade to a SSDD floppy drive with 720 sectors to take advantage of MDOS .97H.

MICROpendium has .97H, 1.14 and MBASIC

Readers who are unable to obtain MDOS .97H, 1.14 or 1.14F, GPL 1.04, MBASIC 2.99A, MENU 80, XUTILS, FIND, SHOWCOLOR, SETCOLOR and REMIND may order the programs from MICROpendium. Send $6 for all or $5 for any combination and state the disk format required (DSDD, SSSD, etc.)

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User Notes

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```
J :: M=INT(9*RND+1)!207
250 N=INT(9*RND+1):: IF N=M
THEN 250 !113
260 FOR RX=3 TO 19 STEP 8 ::
 FOR CX=3 TO 19 STEP 8 :: CA
LL HCHAR(RX-1,CX+2,T+127)::
ON INT(4*RND+1)GOSUB 280,290
,300,310 :: T=T+1 :: NEXT CX
 !068
270 NEXT RX :: GOTO 370 !132
280 J=0 :: FOR R=RX TO RX+5
:: J=J+1 :: GOSUB 320 :: CAL
L HCHAR(R,CX,35+T*8,TT):: NE
XT R :: RETURN !113
290 J=0 :: FOR C=CX TO CX+5
:: J=J+1 :: GOSUB 320 :: CAL
L VCHAR(RX,C,35+T*8,TT):: NE
XT C :: RETURN !067
300 J=0 :: FOR R=RX TO RX+5
:: J=J+1 :: GOSUB 320 :: CAL
L HCHAR(R,CX+5-TT,35+T*8,TT)
:: NEXT R :: RETURN !154
310 J=0 :: FOR C=CX TO CX+5
:: J=J+1 :: GOSUB 320 :: CAL
L VCHAR(RX+5-TT,C,35+T*8,TT)
:: NEXT C :: RETURN !108
320 IF M<>T THEN 340 !114
330 TT=L(J):: RETURN !115
340 IF N<>T THEN 360 !135
350 TT=LL(J):: RETURN !191
360 TT=INT(5*RND+1):: RETURN
 !255
370 DISPLAY AT(3,24):CHR$(14
0)&CHR$(141)&CHR$(32)&CHR$(1
42)!025
380 ACCEPT AT(3,28)SIZE(1)VA
LIDATE("123456789")BEEP:N$ :
: IF N$="" THEN 380 ELSE K=V
AL(N$)+48 :: N$="" !009
390 CALL COLOR(K-47,7,7):: D
ISPLAY AT(6,24):CHR$(137)&CH
R$(140)&CHR$(127)!122
400 ACCEPT AT(6,28)SIZE(1)VA
LIDATE("123456789")BEEP:M$ :
: IF M$=N$ THEN 400 ELSE K2=
VAL(M$)+48 !129
410 CALL COLOR(K2-47,7,7)::
IF ((K-48=M)*(K2-48=N))+((K-
48=N)*(K2-48=M))THEN 470 !24
9
420 IF (K=N)*(K2=M)THEN 470
!080
430 CALL SOUND(500,30000,30,
30000,30,400,30,-4,0):: CALL
 COLOR(K-47,2,2):: CALL COLO
R(K2-47,2,2):: FOR D=1 TO 50
0 !175
440 NEXT D :: CALL COLOR(M+1
,7,7):: CALL COLOR(N+1,7,7)!
103
450 DISPLAY AT(9,8):"pr"&CHR
$(138)&"ss "&CHR$(137)&CHR$(
140)&"y "&CHR$(139)&CHR$(138
)&"y" :: DISPLAY AT(9,8):""
!070
460 CALL KEY(0,K,ST):: IF ST
=0 THEN 450 ELSE CALL CLEAR
:: GOTO 230 !184
470 F=262 :: FOR J=1 TO 12 :
: CALL SOUND(-99,F*1.0594630
94^J,5):: NEXT J :: GOTO 450
 !179
480 DATA 007C040810202020,00
384444438444438,003844443C040
830 !047
490 DATA 00000038447C4444,00
00007C4078407C,0000002428302
824,0000004464544C44 !241
500 DATA 0000007C4444447C,00
28287C287C2828,0038440408100
010 !084
510 FOR CH=127 TO 143 :: REA
D CH$ :: CALL CHAR(CH,CH$)!1
21
520 NEXT CH :: RETURN !043
530 !@P+ !062
540 SUB TITLE(S,T$):: CALL S
CREEN(S):: L=LEN(T$):: CALL
MAGNIFY(2)!239
550 FOR J=1 TO L :: CALL SPR
ITE(#J,ASC(SEG$(T$,J,1)),J+1
-(J+1=S)+(J+1=S+13)+(J>14)*1
3,J*(170/L),10+J*(200/L))::
NEXT J :: SUBEND !160
```

MDOS TIPS—

(Continued from Page 30)

and the disk controller used. Mail order to MICROpendium MDOS Disks; P.O. Box 1343, Round Rock, TX 78680. John Johnson's BOOT program (reviewed March 1989) is available from the Miami User Group (6775 Tamiami Canal Rd., Miami, FL 33126) for $7.95. Contact Clint Pulley for information about c99 for the Geneve at 38 Townsend Ave., Burlington, Ontario, Canada L7T 1Y6. Barry Boone's EXEC, GE[illegible]R and GETKEY programs (reviewed December 1989) are available from Texaments ($17.95+$2.50 S&H) 53 Center St., Patchogue, NY 11772; 516-475-3480.

1991 TI FAIRS

FEBRUARY

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

MARCH

Family Computer Exposition and Ham Radio Festival, (formerly TICOFF), March 6, Roselle Park High School, 185 West Webster Ave., Roselle Park NJ 07204. Sponsored by students of the high school and the Old Bridge Ham Radio Club. For information write the high school or call (201) 241-4550 or call the 24-hour informational BBS at (201) 241-8902.

APRIL

Northeast TI99/4A Home Computer Fair, April 6. Contact Justin Dowling, The Boston Computer Society, One Center Plaza, Boston, MA 02108.

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.

PC Pursuit

Cutting the cost of long distance modem use

By CYNTHIA BECKER

Do you enjoy traveling or going places you've never been before? I do!

The first item you need before you can go to a new location is a road map. However, the *highways* we will be traveling are not the US Interstates, but the *electronic highways* of Ma Bell via Telenet's data service known as PC-Pursuit.

Using this service to place your calls to your favorite bulletin board is only a matter of CONNECTing to a local TELENET node. This saves a lot of money, money that would otherwise be spent on long-distance phone charges. The monthly rate for PC-Pursuit is $30, which entitles you to 30 hours of use. Some of the most informative bulletin boards are in the states of Maryland, Washington, Chicago, Miami, Los Angeles, Boston, and Houston. There are also BBS's in Denver, Dallas, Portland, just to mention a few. There is no limit to the number of bulletin boards you can access using PC-Pursuit.

To use PC-Pursuit, you need the following:

- A Telephone Line
- A modem— 300, 1200 or 2400 baud
- A terminal or PC with asynchronous communications software

Your communication parameters for your hardware should be set up in a consistent fashion with the PC or BBS (host computer) you wish to dial. For example, most bulletin boards use 8-N-1 (8 start bits, no parity, 1 stop bit). Some use 7-E-1. Since I use Telco as my telecommunication's software, I can set these parameters through the auto dial menu. Each BBS I call is tailored to match the parameters of the bulletin board system; e.g. our BBS (QACS) — owned and operated by Barb Wiederhold (Queen Anne Computer Shoppe) — is a TIBBS system. I log on using ADM3A emulation with parameters of 8-N-1, although 7-E-1 would work, since the software was designed to run that way. Incidently, the number is 206-546-1865 or WASEA/12 using PC Pursuit. Be sure your modem is set for the correct baud rate. The only TIBBS board that currently accepts 300/1200/2400 baud are in Texas: Bill Rister and Greg Justice are the respective SysOps. Bill runs his BBS out of Houston. More numbers later.

For a list of local access numbers, see Fig. 1. The reasons I am listing these local (outdial) access numbers are:

By dialing your local Telenet number, you can log into two internal information services: (a) Their updated PHONE listings (National & INternational); and (b) their BBS system, where you can get updated information on PC Pursuit as well as a complete list of city exchanges covered by this service. I will show you how to log into both systems. First, though, I'm going to walk you through logging into the system via your local TELENET access number. I will do this by showing you how I log on. Text appearing in bold print here is what you would enter or see on your screen:

ATDT6259612<cr>
(I usuall auto dial this number using Telco)
CONNECT 1200
TELENET
206 210C
TERMINAL=D1
@C D/ILCHI/12,ID,PW
D/ILCHI/12 CONNECTED
ATZ
OK

At this point, I press F1 to load the auto/dial menu, and select the BBS number.

CONNECT 1200
The NEW chicago TI users group BBS
300/1200/2400 baud
24 Hours
8N1
Runs on a TI99/4A and 20meg Hard Drive
Supporting TI99/4A and Myarc 9640
You are caller #3414
Last caller was Jan203

Enter 0 for new caller
or User #>43

You connect and logon as you would on any local bbs; read your messages and reply.

Password >**
CORRECT

Welcome: CYNTHIA BECKER
From: SEATTLE, WA
You have called 49 Times
Last called: 10/12/90
System level 9

Today is Monday 10/15/90 09:15:15pm
Time limit is 75 minutes

BULLETINS
read the for sale base—make a deal!!
****
MNP error correction is active now!!!!
****
Upcoming events:
CHICAGO INTERNATIONAL TI FAIRE NOVEMBER 2ND AND 3RD, 1990 AT THE HOLIDAY INN ON ALGONQUIN ROAD IN ROLLING MEADOWS...PLAN TO GO TO THE MILWAUKEE FAIRE ON SUNDAY THE 4TH
****
CHICAGO USERS GROUP HOT LINE IS:
7 0 8 8 6 9 4 3 0 4
call it for news information about events
****
ARTICLES IN BY THE 10TH OF EACH MONTH.. LATE ONES BY ARRANGEMENT ONLY! PLEASE DON'T WAIT UNTIL THE LAST MINUTE..THE NEWSLETTER IS FOR YOU, THE USERS!! MAKE IT GOOD, AND ON TIME!
****
the next meeting of the chicago users group will be on November 2nd and 3rd, at the faire, AT THE HOLIDAY INN ROLLING MEADOWS, ON ALGONQUIN ROAD. (JUST OFF RT 53 NORTH OF INTERSTATE 90) HOPE TO SEE YOU ALL THERE!
****

(M)ain Base	**(For Public ONLY)**
(P)rivate Base	**(For Private ONLY)**
(F)or Sale	**(Trade &Wants)**
(O)ptions	**(For Message)**
(H)elp	**(Message Base Info)**
(Q)uit	**(To Main Menu)**

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PC PURSUIT—

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)Fast Log Off
Choice>$

You log off as usual, and get No Carrier.

NO CARRIER
TELENET
@D

At this point you press shift-2 to get TELENET the @ prompt, which I have @D here. I then type 'D' to disconnect, and get the information that appears in Fig. 2.

@HANGUP6hk+jT>W

I can either type HANGUP or go on to another city and node. In this case, I have chosen to HANGUP. I then get the no carrier message. This means I am now also disconnected from TELENET.

Let me show you how to log onto PCP'S own BBS and the MAIL system for getting the complete phone listing (both national and international). This is what you do after getting the @ prompt:

@MAIL<cr>
User name?
PHONES (This is your response.)
Password?
PHONES (This is what you type.)

You are then connected to US Sprint's online directory of SprintNet Local Access Telephone numbers. From the main menu, you can get information on Domestic Asynchronous Dial Service, International Asynchronous Dial Service, Domestic X.25 Dial Service, New Access Centers and Recent Changes, Product and Service Information, or Exit the Phones Directory. The Sub Menu will give you choices of 300-2400 baud access numbers by state, All 300-2400 baud access numbers or all 9600 baud access numbers. This is very useful, especially if you might be traveling and take your laptop with you. The other service you can connect with (and you don't need to be a member of pc pursuit for either) is the PC Pursuit BBS. Again, at the @ prompt do the following:

@C Pursuit <cr>

That's all you have to enter here. You will then be connected and see the following welcome:

Welcome to Telenet's Sun fileserver NETXBBS, a SunOS 4.03 machine SNPBBS - Version 2.0 02/09/90

Your logon has to be as follows:

Enter your first name (or first and last). Type **Telenet Guest**.. (Note that Password and ID are case sensitive.)

Enter Your Password: **outdial** (type this in in lowercase letters just as shown).

You will get a welcome message and a menu with the latest bulletins. I suggest that you read and capture everything to buffer. Once you quit this section, you can (and I strongly suggest that you do) go to the files section. List the files because there is a wealth of information that you can download using the ASCII buffer capture method. The filenames are also case sensitive. In other words, you cannot enter the filename using capital letters. It has to be typed using lowercase letters exactly as the file is listed. Once you have selected the file you want, you must select (A)scii as the method of transfer. Be sure you log to disk. This is how I got the information I needed in order to more effectively use PC Pursuit. Be sure you have a good supply of disks because there is a lot of information.

There are several message bases, but as a new user or non-PC Pursuit subscriber, your access is limited until you register by means of the online questionnaire. However, you can 'test drive' the system just the same, and this is a good way to see whether you want to make this kind of investment. This is a list of the first menu you get:

****
* Available Bulletins to Read
****

Bulletin	Description
1) bullet 1	Info about this BBS

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(Fig. 1) TELENET Access Numbers

Here are just a few phone numbers for local TELENET access in some of the major cities throughout the U.S.A.:

State	Area	City	300/1200	2400
CA	714	Santa Ana	558-7078	550-4625
CA	213	Los Angeles	937-3580	622-1138
CA	213	Los Angeles	624-2251	622-1138
CA	619	San Diego	233-0233	231-1703
CA	415	San Francisco	956-5777	788-0825
CO	303	Denver	337-6060	696-0159
CO	719	Colorado Springs	635-5361	635-2551
CT	203	Hartford	247-9479	724-9396
DC	202	Washington	429-7896	429-0956
FL	305	Ft. Lauderdale	764-4505	524-5304
FL	305	Miami	372-0230	372-1355
GA	404	Atlanta	523-0834	584-0212
IL	708	Aurora	896-0620	896-3363
IL	312	Chicago	938-0600	938-9725
IN	317	Indianapolis	299-0024	299-6766
IA	319	Cedar Rapids	364-0911	362-2764
KS	913	Topeka	233-9880	233-4660
KY	606	Lexington	233-0312	233-7217
LA	504	New Orleans	524-4094	522-3967
ME	207	Augusta	622-3123	622-7364
MD	301	Baltimore	727-6060	752-5555
MA	617	Boston	292-0662	574-9244
MA	413	Springfield	781-3811	737-9285
MI	313	Detroit	964-2988	963-2274
MN	612	Minneapolis	341-2459	338-1661
MS	601	Jackson	969-0036	969-0512
MO	314	St. Louis	421-4990	421-0381
MT	406	Billings	245-7649	248-6373
NV	702	Las Vegas	737-6861	737-5466
NH	603	Manchester	627-8725	625-8088
NJ	201	Newark	623-0469	623-7122
NM	505	Albuquerque	243-4479	242-1742
NY	212	New York City	741-8100	645-0560
NC	919	Raleigh	834-8254	834-8254
ND	701	Grand Forks	775-7813	
OH	216	Cleveland	575-1658	771-6480
OK	405	Oklahoma City	232-4546	232-9513
OR	503	Portland	295-3028	241-0496
PA	412	Pittsburgh	288-9950	471-6430
PA	215	Philadelphia	574-9462	574-0990
RI	401	Providence	751-7912	831-3990
SC	803	Charleston	722-4303	577-4710
SD	605	Rapid City	348-2621	
TN	615	Nashville	244-3702	255-2608
TN	901	Memphis	521-0215	527-5175
TX	214	Dallas	748-6371	745-1359
TX	713	Houston	227-1018	227-8208
TX	512	San Antonio	225-8004	225-3444
UT	801	Salt Lake City	359-0149	359-0578
VT	802	Burlington	864-0808	
VA	804	Richmond	788-9902	343-4140
WA	206	Seattle	625-9612	623-9951
WA	509	Spokane	455-4071	838-9065
WV	304	Charleston	345-6471	345-7140
WI	414	Milwaukee	271-3914	278-8007

PC PURSUIT—

(Continued from Page 33)

2) bullet 2 What is PC Pursuit?
3) bullet 3 Procedures for downloading from here
4) bullet 4 PC Pursuit tips available
5) bullet 5 Message from SysOp
6) bullet 6 Message from Product Management
7) bullet 7 Announcement of PC BusinessCall
8) bullet 8 Answers to Pricing Related Questions
9) bullet 9 Handicapped/Disabled Membership Guidelines
10) bullet 10 Message about User's Guide
11) bullet 11 Current Events?
12) bullet 12 PC Pursuit Holidays
13) bullet 13 *IMPORTANT* New DCWAS outdialing pattern
(Q) QUIT — Exit Bulletin Section

Once you have (Q)uit this section, you will get a limited main menu:
M(essage Section)
F(ile section)
T(oggle page)
B(ulletins)
N(ew user msg)
W(elcome message)
R(ead files)
C(omment to SysOp)
Q(uestionnaire)
G(oodbye)
?(help)

Fig. 2

```
  (1)                        (2)(3)(4)(5)(6)(7)(8)  (9)
D/ILCHI/12 DISCONNECTED 00 00 00:00:03:15 223 35
   ^                        ^  ^  ^   ^  ^  ^  ^   ^
   |                        |  |  |   |  |  |  |   |
   |                        |  |  |   |  |  |  |   +-->Packets From User
   |                        |  |  |   |  |  |  +------>Packets to User
   |                        |  |  |   |  |  +---------->Seconds Connected
   |                        |  |  |   |  +------------->Minutes Connected
   |                        |  |  |   +---------------->Hours Connected
   |                        |  |  +-------------------->Days Connected
   |                        |  +----------------------->Clearing Diagnostic
   |                        +-------------------------->Clearing Cause
   +------------------------------------------------->Remote Address
```

Let me explain what this information means:
(1):this is the node or remote address I called. In this case, it's Chicago, IL 2-5: I seldom see information here (with the exception of #5 which is hours)
(6): minutes connected
(7): seconds connected — you want to keep track of time online using this information. Since it costs $30 a month for the use of this service any amount of time over the 30 hour cap is additional hourly rate.

Commands: M,F,T,B,N,W,R,C,Q,G,?

I suggest that you go to the F(ile section) on your first call. Select item No. 1 which is pcp (pursuit information files). You will get to this sub-menu, and select the F(ile list). This is the information you want to LOG to disk. The first several files are the supported exchange lists for the cities serviced by PC Pursuit. Please be aware that the system is case sensitive. If the filenames are in lowercase letters, then you must type in your selection the same way. There are files on rates, disabled, tc (terms and conditions), how-to, equip, new-user, access, and much more. You want to capture as many files as you can, and be sure to select A(scii) as the method of transfer. After that, just follow the prompts. I suggest you capture each file to its own separate file on your disk. Then you can print the entire thing out and have it handy for reference as well as learning how to get the most from using PC Pursuit in general. There is a file called 'rvprimer' which I strongly suggest you get. Occasionally, you will CONNECT with your destination city and get MANUAL ANSWER instead of the usual Hayes message. This means you are in Racal-Vadic mode. This file will explain fully about this feature of Telenet's modems. A must for any user of PC Pursuit.

I realize there is a lot of information, but to put it all in one article like this would be a magazine unto itself! So I suggest you call the two internal systems and get the whole 'ball of wax' for yourself. Besides, you'll learn more this way doing it for yourself!

READER TO READER

Edwin George, 6700 150th Ave. N., Lot 229, Clearwater FL 34624, writes:

I belong to a computer club in Florida, the Upper Pinellas 99er Group. No one in our group can help me.

I have a color printer, Seikosha model GP 700 A, and I have not been able to make it print in colors. The book that came with it has sample inputs in it for IBM. It prints in blue only. The color test prints all colors OK.

If one of your readers can help me I would be very thankful. My computer is a TI99/4A.

USER GROUP UPDATE

These are additions and updates to our user group listings, begun in our May 1987 issue:

Australia

TI Brisbane User Group, P.O. Box 3051, Clontarf M.D.C., QLD Australia 4019 (new address).

German TI users show ingenuity

Asgard's Chris Bobbitt discovers 'strange hardware'

The following is an edited transcript of a conference on CompuServe's TI Forum. In it Chris Bobbitt, owner of Asgard Software, detailed his experiences as the first North American TI vendor to attend the All-European TI Show held in Weisbaden, Germany. The show was held in October. Beery Miller of 9640 News also attended. The show is a 3-day event. According to one German source, Texas Instruments contributed "a truckload" of TI99/4A products free of charge for distribution at the fair.

For those who've been to a TI faire, things were immediately different. Instead of the traditional layout over here with user groups selling stuff from booths and local, regional and national vendors the get-togethers in Germany are just that — informal get togethers. The chairs were on the OUTSIDE of the booths and massive tables were set up to hold the most bizarre collection of equipment I've ever seen. User groups set up multiple systems and showed off group projects, individuals showed off their own work and the 2-3 dealers of TI stuff were consigned to the flea market area. Beery and I, as honored overseas guests, got tables roughly in the center of the hall.

As I said above, the equipment was bizarre. As Jim Fetzner (an American living in Europe) aptly put it, everyone in Europe has a "mutant" system. Truly — no two were alike. Few peripherals used over here were in evidence and most of the software in use was unrecognizable. Virtually everything in use other then the console was highly personalized — including the software. This presented some problems in demo'ing stuff on the system provided to me but it was tantamount to taking every unusual piece of hardware shown at all the fairs in the states and throwing it into one room. Listing it all would take too long, so I'll just hit the highlights.

There are very few 9640s in Germany (they are really POed about supply far more then we in the states) but everyone else had a Mechatronics 80-column card. Some were highly modified — additional ports, etc. The EPROM in them, owners over here may be interested to know, is about three versions beyond what's here. Most people had IBM keyboards sticking off (literally) their consoles evidently there are 5-6 different interfaces floating around over there for attaching them — many of them quite elegant and cheap. I'm working on importing one in particular.

Most people had GRAM devices or "super cartridges" not traditional 8K or 32K supercarts, mind you, but cartridges with dozens of modules and several banks of GROM, or GRAM devices smaller than a cartridge. I picked up a 40K GRAM, 8K RAM device that emulates a GRAM Kracker for about $75. There is a wide variety of software for manipulating that sort of thing, including a fascinating memory manager utility, a universal GROM loader utility, etc.

Barry Traver would be in liteal ecstasy t all the flavors of XB in attendance. There was an "XB 3" widely in use and versions of 99/8 BASIC for the 4A, etc. .) Some of the BASICs were quite rich, many were huge programs taking up 40-50K in GRAM. In that area, I caused quite a stir with the 99/8 I brought.

Evidently it was the first ever seen in Europe, and by the end of the second day it was up and running (I forgot the power supply — which isn't a standard unit) and everything of value had been sucked out of it — including the 32K ROM and the 16K pascal ROM. I expect to see it running on a 9640 any day now — at least that was what they told me they were going to do with it.

While it was an all-Europe show (attendees from Holland,Belgium, Austria, Switzerland, Denmark, France and Germany) every country had its own style. TI had maintained a laboratory in Holland for 4A development and Dutch users took every scrap of technical documentation not nailed down after October 1983. They did the same in the U.S,, but the difference is that here the stuff was sat upon by its new owners while the Dutch spread it all over Europe. In essence, they had their hands on all these technical docs 2 years before it started to really get out over here. It has also endowed their software development with a substantial head-start. And shows in their projects. We aren't just talking technical manuals, mind you but detailed copies, commented, of original TI source code for everything. The Intern manual seems a bit primitive by comparison.

Other strange hardware included custom P-boxes it seems I saw only 4 TI P-boxes in the whole place. The most unusual was a 6x2x3 FOOT steel case housing an ungodly number of disk drives, 14 or so slots and a power supply big enough to power Berlin. The widely rumored TI-IBM card interface didn't make it there but I saw a preliminary design that "almost worked." I saw several hardware MIDI interfaces but the demo of Mike Maksimik's largely software interface fascinated them. In fact, I got requests from the builders for enough informationto make them software compatible — a promising start.

The software was fascinating. I saw a very well-done stock management package running on a 9640 that I think Beery Miller will be publishing (he knew the author via 9640 news). I picked up an excellent CAD package from a gentleman who seemed to be looking for a US publisher. It does work only on a 4A with a 192K video RAM card. The most fascinating part of it is that it looked like a Macintosh program right down to the little TI menu (complete with a map of Texas instead of an apple) that when pulled down got you 2 desk accessories and an "About" menu (or window).

In terms of application software, there is a bit of a shortage over there. However, there was tons of system software. Lots of p-code stuff including (hold your breath everyone) a version of the p-system that doesn't require a P-code card and will run on a stock 4A, or in 80 columns on a 9640 or a 4A properly equipped Since it only uses the contents of the p-code card, it doesn't seem to be in apparant violation of Pecan's copyrights. As a result, I may be in a position to distribute it soon (at least once I get a final version). A 9640 version is expected it shortly. It runs six times faster then it used to this way. GROM is awfully slow. Also I saw a number of high

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Yet Another Paint Program

Powerful drawing program aimed at 80-column market

By HARRY BRASHEAR

Yes my friends, there is Yet Another Paint Program for the TI99/4A. I assume that when the author, Alexander Hulpke, showed his preliminary efforts to people, they buried their faces in their hands and made something akin to that statement, along with some groaning and moaning. Successive demonstrations brought the same comment so, for the sake of efficient conversation, the name was shortened to YAPP. One curious thing is, there seemed to be some confusion in the name. It is also being referred to as Paint Pro. So, for the moment we'll call it YAPP-Paint Pro. You can call it whatever you like, just don't call it "Ho Hum." Let me assure you; this is not just another Paint Program. It's the beginning of a maturity for our community that only increases our pride in our machine. Okay, I'll get off the soapbox.

YAPP-Paint Pro was designed around the 9938 VDP. Theoretically, that means it will run on the Geneve, Digit 80-column card, and the Mechatronics 80-column device, but for most efficient operation you should have 192K of video RAM, something equivalent to a super cart, (Supercart, Gram Kracker, or equal) and a mouse. You can back-pedal from there, drop the mouse, give up the super cart if you must, but you are going to lose features and fun as you do. Don't despair, though, there are ways to do without the optimum equipment. The biggest losers will be the Geneve users because they don't have enough VDP to do a complete job. That doesn't put them out of the running, it just lops a couple of features off.

YAPP-Paint Pro is loadable with either the Editor/Assembler, Extended BASIC, or in GPL mode on the Geneve. YAPP includes three program image files and a device driver. You have to set up the device you're going to use for drawing first by changing the name on your working copy. There are drivers for the Asgard mouse, (my preference), the Mechatronics mouse, joysticks or keyboard. I believe the mouse driver is subject to programming change. My Horizons seem to be getting in the way of the one on the disk. I'm the only person that has experienced this to date. No problem, there are plenty of mouse drivers floating around and I found one that worked well.

Four graphic modes are utilized with YAPP-Paint Pro:

1. 256 X 212 where each pixel can be any of 256 colors.
2. 256 X 424 x 265 colors
3. 512 X 212 x 16 colors
4. 512 X 424 x 16 colors

I should point out that standard VGA mode on an IBM clone is 640 X 480 X 256, so as you can see, there isn't much noticeable loss there as far as YAPP-Paint Pro is concerned.

Any of the four graphic modes are selectable within the drawing environment, but you have to choose before you start to work. Changing modes mid-stream will lose all of your work.

The default mode (entry mode) is high resolution, 512 x 424 x 16 colors. All you have in front of you is a black screen with a pencil in the upper left corner. Pressing the center mouse button will bring up the color bar and menu beneath it. (I'm going to base this review on mouse control.) The color bar gives you the initial 16 TI colors,

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Review

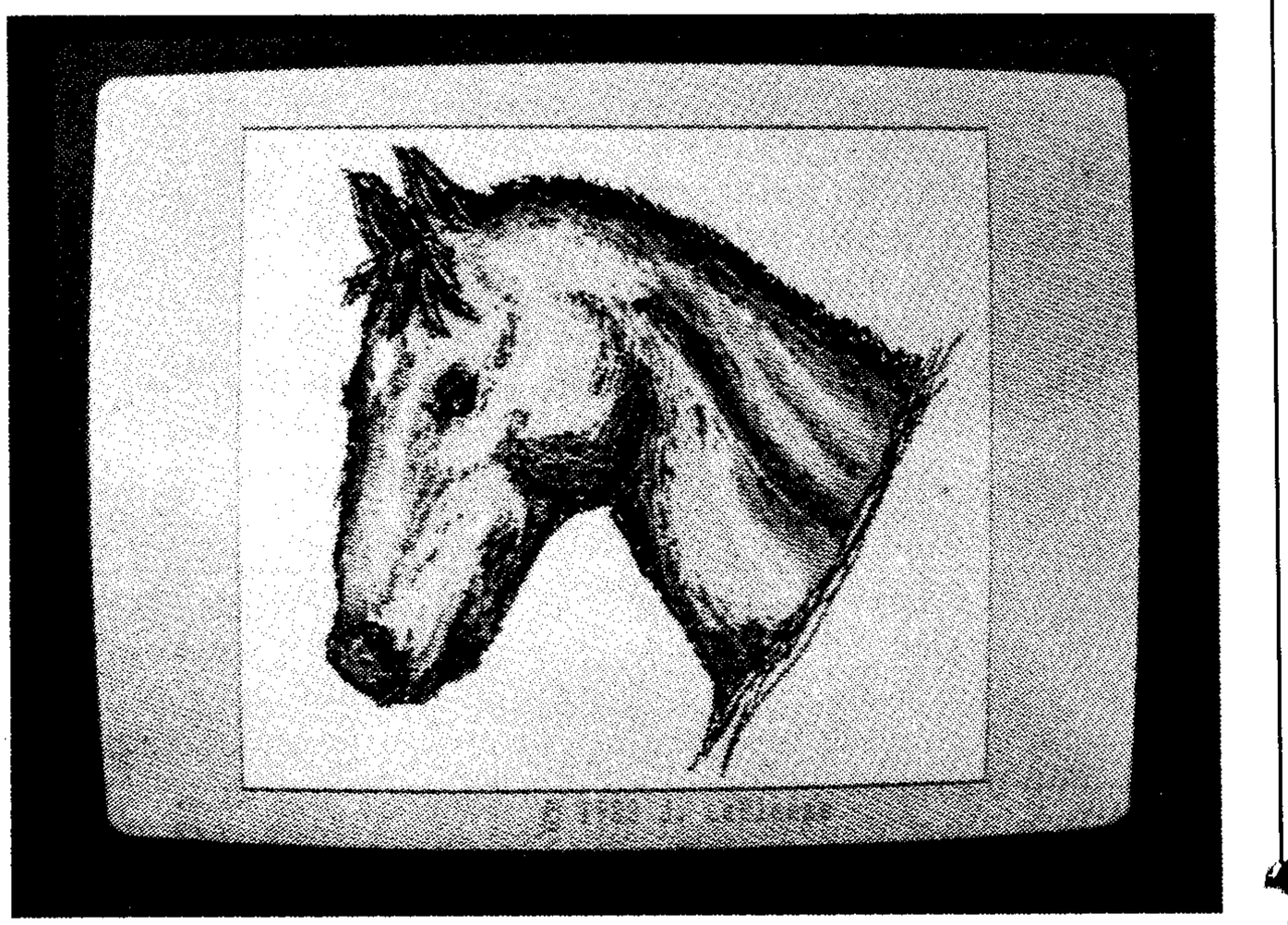
Report Card

Performance	**A+**
Ease of Use	**A-**
Documentation	**A**
Value	**A+**
Final Grade	**A**

Cost: $29.95 plus $2.50 postage and handling.

Manufacturer: Asgard Software, P.O. Box 10306, Rockville MD 20850; 703-255-3085.

Requirements: 80-column device or card or Geneve, disk system. (RGB monitor, printer, joystick, mouse optional.) Loads from XBASIC, E/A or MDOS.



YAPP—

(Continued from Page 36)

but remember, you can have 16 colors from a pallet of 256. That means you can use hues of any single color if you like. For instance, if you were drawing water, you could convert half of your colors to various shades of blue or green. The way this is done is just like mixing Paint. You get to add and subtract (R)ed, (B)lue, and (G)reen to any color with those respective keys. I loaded up a tiger picture and it came in with my color bar ranging from black to white and fourteen shades of brown in between. In case you missed that; the colors you select are saved with the picture.

If you are in low res mode, you get a 256-color rainbow across the bottom of the screen to pick from. Once you select, the color is broken up below into an easier selected group shades of that color. You can't go wrong.

You may also select your color right from the drawing screen with a separate key press. This comes in handy when you are working with close shades, working through a lot of colors quickly, or are in the zoom mode.

Let's romp through the various functions to see if there's anything lacking.

1. Pencil: Normal drawing mode, four brush sizes available.

2. Airbrush: The function of this depends on how good the mouse drive works. It keeps adding Paint until you let off the "trigger."

3. Lines: The old rubberband trick.

4. Frames: Single line frames.

5. Box: Same as frame, but fills with selected color when finished.

6. Circles: Also ellipses.

7. Fill: Very fast and the logic is good. I was able to fill any shape I could make in one pass.

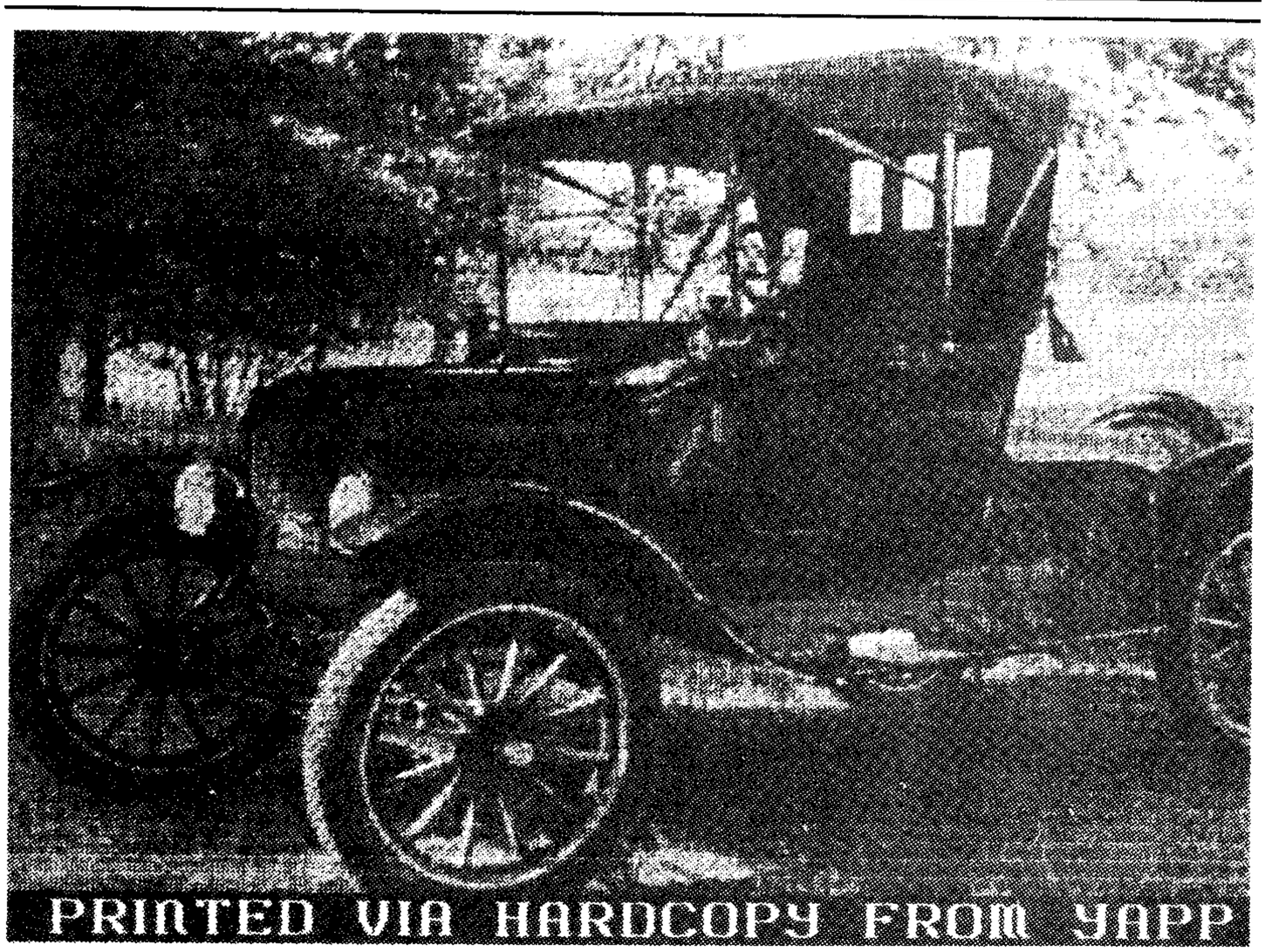
8. Copy: A sized part of the picture with color to anywhere else.

9. Move: Same as above, but erases the area moved from.

10. Capture: Clipping feature so you can save a section in memory. This will eventually become a "saved" clip, but not in this version.

11. Undo: Deletes the last function. Great for those fills that accidently get spilled.

12. Zoom: It's fabulous, and the color bar is still available in the mode. You only get to "pencil". No other functions are available, or needed.



Halftone of printer output from YAPP picture (reduced to 61% of original).

13. Text: Guess what? All of your TI-Artist Fonts can be loaded and used, in exactly the same way you have all these years with old reliable. It also puts all the letters available on the bottom of the screen.

14. Cursor speed: A key press, you get slow and fast, both of which are well within a controllable speed - not too fast, not too slow.

Of the aforementioned functions, capture, zoom, (in interlace mode) and undo, will not work without expanded video memory, (192K).

Basically, there isn't much lacking for everyday drawing and graphic manipulation. I think you will find that it looks a heck of a lot like TI-Artist V2.0, except that you're working with four times the screen area and lot more color. There are a few things missing that are in TI-Artist now, but look how long we waited for those and got by very nicely, thank you! But there are some added benefits to get your creative juices going.

One item I didn't mention is "Logic Operators." There are ten, outside logics that you can select to throw wild hairs into your work — the manual called them creative effects. For example, the selection of one of the operators will allow a transparent drop of a copy or move function. All of them have to do with the way the color is laid down. Use them if you have the nerve. Practice will make perfect. There's always the "Undo" command if you get in trouble with "Logic." I wonder which of the two functions the author came up with first?

How about the I/O? Well, YAPP-Paint Pro will load two formats, (for the moment). Modified MyArt and — (drum roll, please) GIF! Yes folks, it's true. With a super cart or equal, you load in all those vile nudies you've been getting off of the IBM networks into your TI, and manipulate them to taste. That is, you can move parts, copy parts, give them a suntan.... Forget it, I've said enough. But there goes your last (and possibly most important) reason for buying a clone right down the tubes.

GIFs come in a few different formats, including one that loads in a "scanning" mode. By setting the program for "auto-detect," it will figure out which graphic mode is needed and load to that mode automatically. It will also tell you what kind of picture it is, how big, and ask if you want to shift it around or co[illegible] Compression does not throw

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YAPP—

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out of Proportion. As a matter of fact, it helps in a lot of cases.

All pictures are saved in the modified MY-Art format.

I'm sure that at some point, you are going to want to print out these beautiful, multi-colored wonders. Forget it, you can't get there from here. The program would need a color driver, or something to convert everything to shades of gray — there just isn't room. Included in the package is a program called "Hardcopy" that will do it outside of the YAPP-Paint Pro environment. It converts the picture to grays with 256 different on/off pixel patterns. You can make them up yourself or use the defaulted ones. Actually, since you have the option of changing things around, you can come up with some pretty nice prints. The printout reminds me of the "dither" methods used in clone scanners.

Time for the bottom line: I like YAPP very much. There were a couple of things that I had a problem with, primarily getting used to mouse control, which you don't have to put up with if you don't want to. Once you're into electronic rodents, though, they become lovable little beasts. There are a couple of tiny bugs, but nothing that causes a big problem. One of them has to do with a defaulted hard drive path dot. The other was a little frustration with loading MY-Art files with the autodetect. Again, no big thing.

This is version 1.0 of the program and I expect new functions to be added on a regular basis. I would like to see some formatting for PagePro and possibly Macintosh files. If they don't occur in YAPP, maybe someone will get busy and create a conversion utility, about twice the size of PixPro.(Are you listening Jim Reiss.)

The 44-page documentation is thorough, though a bit repetitious. If you take the time to read the manual, you will find them easy to refer back to. The program isn't hard to learn. I think I had more trouble with TI-Artist 2.0 than I did w YAPP-Paint Pro.

The package consists of three disks, one for the programs and two for fonts and artwork to get you going. As I said above, fonts are no problem if you have TI-Artist, and there are thousands of GIFs to be had on any bulletin board in the country that caters to the clones. You won't be at a loss for raw materials. The cost is only $29.95 plus $2.50 S&H, an excellent price for nearly the equivalent of VGA graphics on the TI.

This is only the beginning of new items coming from Germany. Asgard is going all out to tap this new source for us, including trips over there. The German people are up to their necks in new eighty column stuff because there are so many Mechatronic cards over there. A lot of it is going to be fairware, but there will be a lot of super commercial products coming, too. YAPP-Paint Pro is a fantastic beginning.

Hardback

You can't do better than this to back up your hard disk

By BEERY MILLER

Not often can someone use a program for the first time and instantly save hours of work without even reading the documentation. Hardback, by Tom Freeman, is one such program that is a joy and a timesaver.

What is Hardback? Hardback is a program that requires the Myarc Hard and Floppy Disk Controller and backs up one hard drive to another, or even the same hard drive. Backups of a hard drive to a floppy are not possible with this program. If you want to back a program up to a floppy, you must use the Myarc Disk Manager V program and swap the floppies as necessary.

The first question one might ask is — what do I gain by backing one hard drive to another? Well, the first is, obviously, speed — perhaps two hours for 40 megabtyes (not sure, always went to bed while it was running) versus 24 hours to floppy, assuming you were attentive swapping disks. The second is that you can let the program run unattended. Letting the program run unattended is nice, as that could be your last task to implement before going to bed at night and then in the morning you could simply turn the computer off after everything was done.

Review

Report Card

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

Cost: $15

Manufacturer: T&J Software, 515 Alma Real Dr., Pacific Palisades, CA 90272

Requirements: TI 99/4A or Geneve 9640 and a Myarc HFDC

Many users may think that might be a waste of a drive or too expensive an option to consider. If you were once considering the tape drive option as your backup support, the hard drive to hard drive option is available now, and is probably cheaper than the tape drive option (which will probably never become reality) that would require a tape drive and possible power supply system, depending upon your system setup.

Many computer users often don't back their hard drive up, usually because it is too inconvenient. Hardback makes it convenient, hands down. Hardback gives no excuses for not backing your *important* information up.

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HARDBACK—

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As noted above, Hardback backs up files from one hard drive to the same or another hard drive. If you opt to back files up to the same drive, you provide yourself some limited security if you accidentally erase files, or if somehow they become corrupted. But you don't provide security for your system if the drive crashes. My suggestion is always to back up to a separate independent system. When Hardback backs your files up to another directory on your hard drive, or to another separate hard drive, they are usable as is. You don't need to uncompress, de-arc, etc. No file compression is done, so therefore to ease the weary mind, you can selectively test files, programs and information on the backup device (unlike MDM5 and its awkward backup feature where if you lose one sector from one of many floppies, you may be doomed to lose everything from that floppy on).

My backup hard drive is one I put together from two bad hard drives that had failed some time ago. Placing all the good parts onto one hard drive, I had a reliable drive I could connect to make a backup when I felt it was necessary. Usually my drive remained disconnected as I did not want to get into the habit of storing data on it when the first hard drive came close to being filled. Rather, I wanted to use it only when necessary.

With my system and, I am sure, with other user's hard drives, there are files that are "not important." If the system crashes, a normal file copy might well be easier. In my case, I have graphic pictures in about four subdirectories that easily eat up 15 MB of disk space. I don't back these up, because they are on floppy, and my backup hard drive is smaller than my primary drive. My primary hard drive is 40 MB, and my backup drive is 10 MB. I have about 15 MB of free space on my primary hard drive so I have no problem squeezing the necessary files onto the backup drive.

USING HARDBACK

Now let's get down to the brass tacks of using Hardback. Hardback is an EA5 program image file, loadable through Funnelweb, the Editor/Assembler module, or any EA5 Menu program. It runs on the TI99/4A, or the Geneve 9640 using MDOS V1.14 *or* MDOS 0.96H or future versions (I can attest for MDOS 0.97H) as Hardback uses the EPROM for the necessary hard drive access routines (I suspect if you have an EPROM earlier than H7, difficulties may arise. In most cases, an earlier EPROM version will already be giving you problems. Consult Myarc if you are in the minority and fit in this group).

When the program first loads, you will see the title screen and the option to change Background/Foreground colors or to Continue.

The next screen prompts for drive choices. This is where you decide to back hard drive 1 to hard drive 2 or any other possibility permitted by your system. One caution I discovered with my system and have heard from others using the Myarc HFDC: On some systems, the third hard drive slot is not available for everything. In my case, I can read from the hard drive, but cannot write to it. This is a problem that has been identified with some cards and is not related to Hardback or any other program. An oversight may have occurred in some of the earlier HFDC's shipped on the board, but I am not an authority on the subject. I just know there might be a problem.

I highly recommend Hardback to any Myarc HFDC owner. It allows me to perform a routine backup much easier than any other program available for the 4A and Geneve 9640 and allows me to do something else independent of the computer when the backup process is running. In my case, that is when my wife "multi-tasks" me around the house!

Once you have selected the input/output devices/path, the next option is to continue to the next screen where the input drive will be cataloged and the directories displayed. The format of this screen is similar to MDM5 to provide a base of familiarity. (See, I said you didn't need to read the docs.) You can select to drop down a subdirectory level by marking the directory, or even catalog the files at any level you are positioned. Once you have marked the directory to start from as the primary level, everything in that directory and those directories below it will be backed up to the output device. You also have the option of printing the tree structure from the directory at and below and even printing just the files in that directory to floppy.

After you have selected the backup feature, you are prompted with a few questions and options.

The first question is in regard to the output device and whether or not you want all the files to go to a specific subdirectory on the output drive. If you answer yes, you must provide a valid path. If not, everything is built up the root level of the output drive.

The next question is whether you wish to back up only modified or new files. You do not need to back files up that have already been backed up earlier. Answer yes, and you will save considerable time if the drive has already been backed up once.

The last question you will be asked is whether files being backed up on the input drive should be marked as backed up or not. The choice is yours. The next prompt that follows turns the program loose to make the necessary backup. During the backup procedure, screen updates are constantly displayed showing the number of sectors to copy, number of files to copy, current directory being backed up and current file being copied.

ERROR MESSAGES

If for some reason a bad file is present on the input drive, a bad bitmap of a directory is present, or anything that might be "strange" to Hardback, an error message will be displayed with the current file. Pressing any key allows you to continue with the backup procedure, but also allows you to mentally flag the problem.

For instance, my hard drive has a subdirectory that got "lost" and has pointers

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HARDBACK—

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to impossible files. Originally, the directory name was called MDOS. Fortunately, I had a backup from an earlier date and recovered those files, but Hardback (or any other program), would err while in that directory. There are a couple of solutions to work yourself around this problem if you have a bad directory in a middle of many directories. Since Hardback backs everything up from the backup level alphabetically, renaming a bad directory "ZMDOS" places it on the bottom of the list. When Hardback then starts backing that directory up, everything else is already done and you don't have to worry about it. I only offer this solution as the lazy man's way of not worrying about reformatting the hard drive to make it completely usable. It saves time, which is Hardback's purpose.

Another technique I use is with my GIF collection that uses 15 MB of space. Currently the directory names are GIF1, GIF2, GIF3 and GIF4. Prior to backing the drive up, if I do everything at root level, I rename those four directories ZGIF1, ZGIF2, ZGIF3, ZGIF4. When those directories are reached during the backup procedure, everything I was "concerned" about has already been backed up. Anything copied from these directories is then excess.

The biggest problem many people might face is not wanting to spend $200 for a hard drive just for backing files up. Why should anyone? The answer is, you don't need to spend $200. Many computer trade shows, hamfests or other magazines offer used hard drives at low prices. I have seen many times a 20 MB hard drive for around $100. Usually the vendor has a computer set up that can prove the drive works. The backup drive doesn't need to run all the time with your primary drive. It only needs to run when you use Hardback. In my case, a hard drive sitting in a cushioned foam box with backup files is much safer than 100 to 200 floppies stored away for MDM5 to restore my system. In either case it might only take one byte to mess things up, but floppies will always be less reliable and will be more *time consuming*.

I highly recommend Hardback to any Myarc HFDC owner. It allows me to perform a routine backup much easier than any other program available for the 4A and Geneve 9640 and allows me to do something else independent of the computer when the backup process is running. In my case, that is when my wife "multi-tasks" me around the house!

Miller publishes the 9640 News diskazine. He can be reached at P.O. Box 75-2465, Memphis, TN 38115.

MicroReviews

Module expander, poster maker and font encyclopedia

By HARRY BRASHEAR

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

★ Leave it alone, back to the drawing board.

★★Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

Merry Christmas everybody! Considering various time factors, that greeting may be a little late, but it's sincere.

A few of you may have heard those immortal words on Christmas morning, "Gee Hun, it's not much, but I didn't know what to get you. I feel bad about that."

I hate seeing a spouse feel bad, so here's a late Christmas list that you might want to present. Depending on how much guilt you managed to bestow, check a few off a few items and hand it over. It'll make her/him feel better in the long run.

A new 3000 Horizon card with a full meg on board.

An 80-column card from Asgard

A new pair of half height Teac drives

A Rave keyboard

A RGB/TTL/composite Magnavox monitor

TI-Base Version 3.01 from Texaments

YAPP for the 80-column card or Geneve from Asgard

A Genius Mouse from Asgard

TI-Artist Plus from Texaments

Well that ought to give you a few ideas at least. If you already have all of that stuff, bum a few bucks and pay up on your fairware items from 1990. You'll feel good and make some other people feel good about us.

★ ★ ★ ★

XBASIC Module Expander

Here's a little doodad that you hardware types may not have run into yet. It's called the Extended BASIC Module Expander, a simple little device to eliminate that clutter of cartridges that you keep around your computer desk. It was first sold at the Lima fair last year and seems to have made quite a hit with the people that bought it, myself included.

The kit contains all of the hardware to build the little monster, including the box, the switch, interrupt button, sockets, wire and connectors. Of course, you must supply the cartridge GROMs. That's the idea, your get rid of YOUR clutter of cartridges.

You start with your Extended BASIC cartridge and build on it from there by removing the GROMs in your other cartridges and pressing them into the little board you make up with the kit. Then you add a rotary switch, a interrupt button,and make a few connections with supplied wire. Everything installs into the little box and three quarters of a cartridge case. Probably the hardest thing in building it, cutting up one of your old boards for use

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MICROREVIEWS—

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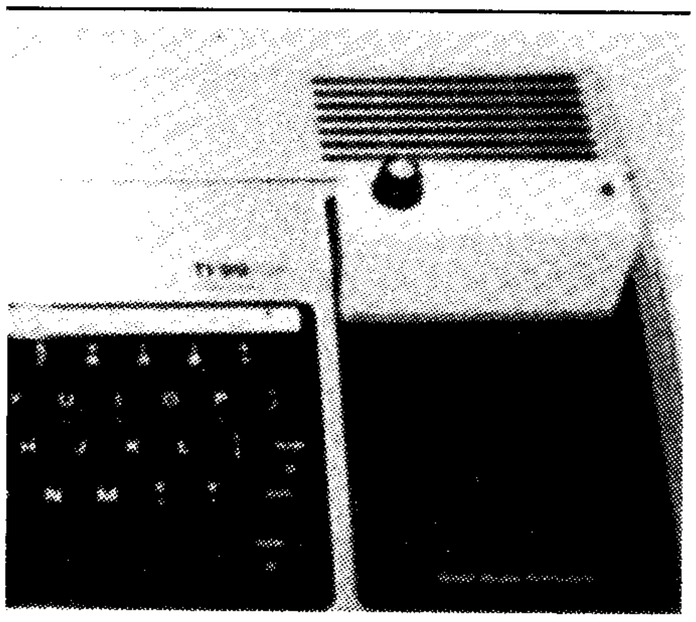
in the kit, and cutting off the back of one side of the cartridge. This is for the box to fit into.



The box is pre-marked around the rotary switch for XBASIC, then the Editor/Assembler, then numbers from 1 to 4. It's assumed that most anyone would want the E/A with XB, but then you can add four other GROMs of your choice. I have Multiplan, Disk Manager II, the Adventure cartridge, and the Speech Editor in mine. Some others you could include are: TI-Writer, Personal Record Keeping, Tunnels of Doom, etc., as long as they are 16 pin GROMs.

You're supposed to start with the XBASIC board, but I also chose to use another cartridge shell, one of the tan ones, because the pre-made box is that color. The directions are a snap. There are plenty of illustrations to work from and the dialog is adequate. The docs were done with PagePro, a heck of an ad for what that program can do for stuff like this.

What I like is the fact that this device gives me access to six modules, yet never gets in my way. It's the same size as a cartridge, just a bit taller.

The cost of the kit is $25 plus $3 for shipping. If you would like one built for you, send the XBASIC cartridge and the others you want installed. The cost for completion will be $43 complete. Since that darn cartridge port is our weakest link, anything you can do to stop using it so much, extends the life of your TI that much more.

Send money to: William Shores, 5737 Glendale Drive, Lockport NY, 14094.

★ ★ ★ ★

PAGE PRO POSTER MAKER

Here's a fabulous new addition to the never ending chain of Page Pro utilities, and one that has been long awaited by many who knew it was coming. True to form, Ed Johnson, the author of Page Pro, has made this program super user friendly and as usual, his sense of programming perfection shines through.

The idea behind the poster maker is that you can print out PP pages or PP pictures in four sizes: Normal, 2X, 4X, and 8X. You also have the choice of normal, double or hi-res densities for optimum reproduction. Believe me, the hi-res mode doesn't even leave a light character row because it goes over it twice with a tiny jump in between to cover those annoying little white lines.

Another nice feature is that the program is geared for both mouse and keyboard. The only thing you need to do with the keyboard is to type in the file name of the picture or page you are going to print. Everything else is multiple choice, just point and click.

The speed is up to par with the program, being in assembly. It takes less than 30 minutes to print out a 4X picture in the best resolution. What I have been having fun with is converting all those nifty Macintosh pictures over to PagePro via the MacPix utility and then dumping them through the Poster Maker. Anyone for a bigger than life picture of Conan, 88 inches high by 68 inches wide?

The pictures are printed in vertical format so that you get continuous strips for length. All you have to do is tape the long strips together. One thing the program left out, though, is a position test. If you can get the picture to print right to the side perforation it's a lot easier to put together, no cutting, and you get a bit of overlap to tape to on the back. This was an oversight of course, and in no way affects the capabilities of Poster Maker. You can write a little BASIC program to print out a block character starting with the edge to accomplish the same thing.

The asking price for Poster Maker is $12.95 plus $2.50 for shipping. It's well worth the price, and it's a lot of fun to boot. (Did I really say that!)

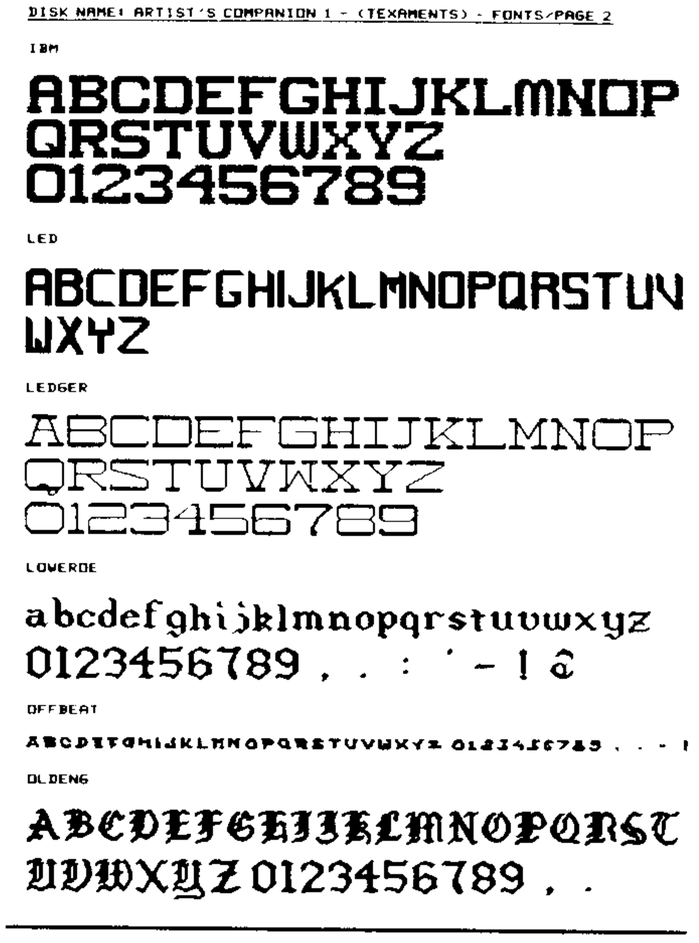
Send your money to: Asgard Software, P.O. Box 10306, Rockville, MD 20849.

★ ★ ★ ★

The Chicago TI-99/4A User Group's Encyclopedia of Graphics for the TI and the 9640 Home Computers

This product gets four stars for having the longest title that has ever been printed in MicroReviews, and, for a couple of other reasons also.

First of all, it accomplishes what I really wanted to do when I wrote Desk Top Publishing on the 99/4A, but found that I just didn't have the strength for the undertaking — A complete pictorial of every font available for the TI and Geneve. It took the author/compiler Don Jones about 156 pages to do just this area of our graphics, (fonts only) supreme justice.



The fonts cover Artist Companions, Artist Companion Plus! extensions, The Printers Apprentice, (including M-DOS versions) CSCG, Asgard Artist Fonts, Page Pro 99 Large Fonts and Headline Fonts, Certificate Maker, and of course, the ever elusive JP Software Fonts. These are all set up on a package basis. In other words, whatever was in the package is pictured. The back index covers all of the fonts, regardless of packaging, in alphabetical order.

The cost of this manual is an incredible $10 plus $3 shipping. That's less than 10

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MICROREVIEWS—

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cents a page! Nobody's gonna get rich on that, it's a give away.

The reproduction is excellent throughout and the manual has been punched for a three-ring binder.

This is only the first of many to come, the next being all of the TIPS stuff. I'll report on that as soon as I have it in hand. In the meantime, if you use graphics at all, don't fail to add this excellent effort to your library.

Send to: Chicago Users Group, c/o Donald C. Jones, 719 Monroe Street, Evanston, IL 60202-2612.

UPGRADES

There are a couple of upgrades I should let you know about if you haven't already heard.

FUNNELWEB V4.31 is a major upgrade for 40-column users. It has all of the features of the 80-column Disk Review program. There's even a feature that the 80-column version doesn't have — the ability to copy to a single disk drive. You have to get this one from your local user group, since it isn't allowed to go up on the networks. It is also recommended that additional funds be sent to the authors, Tony and Will McGovern, for this upgrade. (It can also be ordered from the Lima 99/4A Users Group. See page 16 for more information.—Ed.)

If you have been having problems with SpellIt from Asgard, there is a new version that is said to work out of Horizon RAMdisks now, but you have to label the ram as CRU >1000. That's a little hard to do when you have an 80-column card that demands the same address.

Speaking of Horizon RAMdisks, sell your old ones and try out one from the 3000 series. You can now put about 1.5 megabytes of memory on the board with the new 128K chips. I just finished one and I will probably give you a report on it next month. Also, if you have had trouble with ROS 8.14, order a modification kit for 35 five cents from Bud Mills Services. A minor hardware bug was found that causes some grief in the model 2000 and 3000 boards.

Till next time....

If you would like your software reviewed in this column, send it to Harry T. Brashear, 2753 Main St., Newfane NY, 14108. If you would like it returned, include a SASE. Always include your phone number with your software.

FUNNELWEB V4.31—

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single floppy drive, which cannot be done on the 80 column DR. Other enhancements include the ability to specify a character set (such as a foreign language CHARA1 file) for the text editor and assembly editor (by pressing FCTN9 from a central menu) and the ability to mark fils using Quick Directory (invoked by pressing AID) from within the formatter or assembler.

Good says he has added to the disk the group is sending out some public domain foreign language CHAR files that can be incorporated into the Funnelweb editors to give a screen (but not printer) display of foreign letters. Also included on the 80 column disk are DM1000 (files MG and MH) and John Birdwell's DSKU V4.2 preconfigured for use within Funnelweb.

GERMANY—

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ly modified versions of the operating systems including one gentleman who, in an amazing example of Teutonic patience, ingenuity, and perhaps futility completely rebuilt a 99/4A from scratch (mind you, no faster or better) completely in wire-wrap. He had a custom operating system he called "Proton" running on it that seemed quite ingenious. He did have to download it over the joystick port from another machine (at 6000 baud) but once up and running it was very intuitive. It emitted so much RFI noise that he had to house it in a chicken-wire frame.

User Notes

Double column printing

This comes from Mike Rotolo, of Monroe Connecticut. He writes:

Regarding dual column printing with TI-Writer (January 1986), try this:

Create two documents, one for each column. Run each through the Formatter if desired, directing the output to disk. Then run the following program from Extended BASIC. It simply takes a record from each file and concatenates them to form one print string. It also removes the Carriage Return from the first record and adds the desired margin.

This is a bare bones program and certainly can be enhanced by including prompts for line length (for condensed mode) and number of columns, automatic calculation of margins, etc. Now what we need is for someone to write a similar routine in assembly and patch it into the Formatter as an additional command (.DC perhaps?).

```
100 CALL CLEAR :: FL1,FL2=0
:: INPUT "FILENAME for colum
n 1:      ":F1$ :: IF F1$=""
 THEN STOP ELSE INPUT "FILEN
```

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User Notes

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```
AME for column 2:      ":F2$
 !131
110 INPUT "Output device: ":
P$ :: INPUT "Column width: "
:W :: INPUT "Margin between
columns: ":M !225
120 IF (2*W+M)>80 THEN PRINT
 "SORRY, LINE TOO LONG.":"Hi
t Y to reenter, N to quit" :
: GOSUB 200 :: IF K=89 THEN
110 ELSE STOP !130
130 B$=RPT$(" ",W):: M$=RPT$
(" ",M)!075
140 OPEN #1:F1$,INPUT :: OPE
N #2:F2$,INPUT :: OPEN #3:P$
,OUTPUT !199
150 IF EOF(1)THEN A1$=B$ ::
FL1=1 ELSE LINPUT #1:A1$ ::
IF SEG$(A1$,LEN(A1$),1)=CHR$
(13)THEN A1$=SEG$(A1$,1,LEN(
A1$)-1)!164
155 A1$=SEG$(A1$&B$,1,W)!004
160 IF EOF(2)THEN FL2=1 :: A
2$="" ELSE LINPUT #2:A2$ !23
0
170 IF FL1 AND FL2 THEN 180
ELSE PRINT #3:A1$&M$&A2$ ::
GOTO 150 !051
180 CLOSE #1 :: CLOSE #2 ::
GOTO 100 !230
```

Sure-fire method for boot-tracking

This comes from Bruce Harrison, of Harrison Software. He writes:

We've come across a fairly sure-fire method of "boot-tracking" which we'd like to share.

If a program is to work from any disk drive, it must be able to determine from which drive it was loaded. The first of the attached assembly source code fragments is set up as a demo of this process, and operates when assembled as an Option 3 Editor/Assembler object file. With some modification, this code will work within an Option 5 E/A program. The basic idea is to retrieve for the program's own use a string of characters which gives the device name from which the last "Load and Run" or "Run Program File," or under Extended BASIC the last OLD or RUN "DSKX.PROGRAM" type operation was performed. This will work correctly with floppy drives, RAMdisk drives or hard drives.

The second source code fragment gives an assembly subroutine for use with ALSAVE (see the BASIC/Assembly article, September 1990 MICROpendium—Ed.) and an Extended BASIC program. This will report the device name into any string variable. This will only work if embedded by some method such as ALSAVE into the XB program. It will *not* work to report after a CALL LOAD("DSKX.OBJECT") type operation in XB. Once embedded, the

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Boot Tracking for use with ALSAVE and XB

Program 1

```
* FRAGMENTS - SOURCE CODE FOR GETTING
* DEVICE NAME AFTER LOAD AND RUN OPERATION
* ASSEMBLED AS FRAGMENT - TYPE 3 E/A PGM
* HARRISON SOFTWAR - 2 OCTOBER 1990
*
       REF  VMBW,KSCAN
       DEF  START
START
       MOV  R11,@>8300    STASH RETURN ADDR
       LWPI WS            USE OUR WORKSPACE
       MOV  @>83D0,R12    GET THE CRU BASE IN R12
       MOV  @>83D2,R9     GET THE ROM ADDRESS FOR DEVICE
       LDCR @ONES,0       ENABLE THE ROM
       AI   R9,4          ADDING FOUR PUTS US AT THE LENGTH BYTE
       MOVB *R9+,R4       PLACE THAT IN R4 AND INCREMENT R9
       SRL  R4,8          RIGHT JUSTIFY LENGTH IN R4
       LI   R10,TEXT      POINT TO TEXT BUFFER
       MOV  R10,R1        MOVE THAT ADDRESS TO R1
       MOV  R4,R2         PUT LENGTH IN R2
MOVIT  MOVB *R9+,*R10+    MOV ONE BYTE FROM ROM TO TEXT BUFFER
       DEC  R4            FINISHED?
       JNE  MOVIT         NO, DO ANOTHER BYTE
       LI   R0,12*32+9    SET SCREEN LOCATION IN R0
       BLWP @VMBW         WRITER THE DEVICE NAME TO SCREEN
KEY    CLR  @>837C        CLEAR STATUS BYTE
       BLWP @KSCAN        SCAN KEYBOARD
       CB   @ANYKEY,@>837C        HAS A KEY BEEN STRUCK?
       JNE  KEY           IF NOT, SCAN AGAIN
       LDCR R4,0          DISABLE THE ROM (R4 IS ZERO AT THIS POINT)
       LWPI >83E0         LOAD GPL WORKSPACE
       MOV  @>8300,R11    GET RETURN ADDRESS BACK
       CLR  @>837C        CLEAR THE STATUS BYTE
       B    @>006A        RETURN
TEXT   BSS  6             BUFFER FOR DEVICE NAME
WS     BSS  32            OUR OWN WORKSPACE
ANYKEY      BYTE >20      SPACE CHARACTER FOR KEYPRESS COMPARISON
ONES   DATA >0101         WORD TO TURN ON ROM IN CRU
       END
```

Program 2

```
* STRING ASSIGN DEVICE NAME
* PLACES DEVICE NAME IN AN XB STRING
* HARRISON SOFTWARE - 8 OCTOBER 1990
* FOR USE WITH ALSAVE AND EXTENDED BASIC
* TAKES ONLY 42 BYTES OF MEMORY
STRASG EQU  >2010
WS     EQU  >20BA
       DEF  DEVICE
DEVICE
       LWPI WS            USE OUR WORKSPACE
       MOV  @>83D0,R12    GET THE CRU BASE IN R12
       MOV  @>83D2,R2     GET THE ROM ADDRESS FOR DEVICE IN R2
       LDCR @ONES,0       ENABLE THE ROM
       AI   R2,4          ADDING FOUR PUTS US AT THE LENGTH BYTE
       LI   R1,1          FIRST PARAMETER
       CLR  R0            NOT AN ARRAY VARIABLE
       BLWP @STRASG       ASSIGN THE DEVICE NAME TO STRING
       LDCR R0,0          CLEAR THE CRU, DISABLE ROM
       LWPI >83E0         LOAD GPL WORKSPACE
       B    @>006A        RETURN TO GPL INTERPRETER
ONES   DATA >0101         WORD TO TURN ON ROM IN CRU
       END
```

User Notes

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routine can be called by CALL LINK("DEVICE",X$).

The idea for this originated from a phone conversation I had with Chris Faherty on the subject of boot-tracking with hard disks. I mentioned the method of getting the byte from location >3FF5 in VDP RAM, which works just fine on my system, but Chris pointed out that this may not work with Myarc controllers. Chris suggested that when a program first loads, the CRU base (Communications Register Unit) for the device should be left at memory location >83D0.

I tried that out by loading the TI debugger from Drive 1, and sure enough the location >83D0 contained the value >1100, which is the CRU base for the TI disk controller. I then looked at location >83D2 and found that contained an address in the >4000 area. Sure enough, by enabling the CRU to read the ROM, I found that five bytes beyond that address from >83D2 was the device name DSK1, and that the byte preceding that "D" was the length of the device name. Additional experimentation showed that this worked equally well for the loading of DEBUG from my Horizon RAMdisk (DSK5).

FUNNELWEB NOTE

On another subject, we noticed in the October issue a letter from a user of Funnelweb with a complaint concerning the RAMDOMIZE process. I'd bet folding money that the user gets into Funnelweb under Extended BASIC through the LOAD program. About two years ago we reported a bug in XB, which renders RANDOMIZE ineffective if XB finds a LOAD program in drive 1. The solution we've applied for that is simple and effective. Modify the LOAD program with one line somewhere near the beginning as follows:

CALL INIT :: CALL PEEK(-31880,I,J) :: CALL LOAD(-31808,I,J)

These instructions will take the number from the screen timeout counter and place it in the Random Number Seed. After that, RANDOMIZE will operate as it's supposed to. Our thanks again to Harry Wilhelm, who suggested this solution back then.

RAMdisk was the culprit

This comes from Bent Odgaard of Wheaton, Illinois. He writes:

At the TI Faire held in Chicago in November I purchased the Series 2 MICROpendium disks. The program I was most interested in was the CHARA1FIX program (by Wayne Stith). Unfortunately, I was unable to run it. Although the program loaded, when I tried to load the CHARA1 file I got an I/O error. I called MICROpendium, and you were kind enough to send me a new disk with a copy of CHARA1FIX and CHARA1 in the hope that it was a sector problem.

To my dismay, the same things happened again. I could load CHARA1FIX, but not the needed CHARA1 file. After some fiddling and thinking I tried removing my Horizon RAMdisk. I was then able to load the program and run it. As a fix, however, it would be troublesome to have to remove the card every time you want to run the CHARA1FIX program. So next I tried to load it using the Editor/Assembler cartridge. I had the same results as with Extended BASIC. No luck.

I eventually found out that in order to make the CHARA1 file load all one has to do is load it through TI-Writer. I have my 32K expansion built right into the console, a Rave 99 keyboard, and a Horizon RAMdisk with Funnelweb's fantastic programs and files "onboard." So if anyone out there has any problems with CHARA1FIX, try loading TI-Writer first, then reset, then select Show Directory and select CHARA1FIX. Then load the program through Option 3 (Run Program), and you should have no problem. (The method works while running Funnelweb.—Ed.)

Reminders Search

This is the third installment of Bill Gaskill's Reminders system of programs. Refer to the September and October 1990 issues for previous installments. This month's Reminders program is called NPSEARCH. Reminders is used in conjunction with Gaskill's NotePad screen editor (February 1990, MICROpendium).

NPSEARCH is used to locate specific information between two dates or between two dates with a text string search parameter.

To use the Search program simply enter the beginning and ending dates of the search and then any text to be located in those memos that fall within the date parameters just entered. Optionally, you may press Enter at the prompt for the text to find and only the date parameters will be used for search purposes. Thus any memo falling within the beginning and ending dates will be displayed, regardless of the text in the memo.

When a memo that falls within the dates specified is found, the first 19 lines of it are displayed on the screen. A flashing command line appears at the base of the screen prompting you to press;

Enter — to pass the current file up and continue the search,

FCTN 6 — to page to the next screen,

P — to print the memo, or

FCTN 9 — to exit.

```
1 !NPSearch 08/11/90
   Bill Gaskill
   GRand Junction, Co. !084
2 !Requires Brad Snyder's
   40-Column Utilities !054
100 CALL LINK("CLS"):: CALL
LINK("TEXT",16,5):: CALL CHA
R(126,"00FF"):: CALL LINK("D
ISP",2,12,"Search Reminders"
):: CALL KEY(5,K,S):: GOSUB
670 !139
110 ON BREAK NEXT :: ON WARN
ING NEXT :: DIM A$(66):: DR$
="WDS1.CAL.90." :: CALL LINK
("DISP",22,3,"Enter beginnin
g search date.")!211
120 ON ERROR 600 :: CALL LIN
K("DISP",6,3,"Begin Date:  /
  /"):: CALL LINK("DISP",7,1
4,"- - -")!081
130 CALL LINK("DISP",9,3,"
End Date:  /  /"):: CALL LIN
K("DISP",10,14,"- - -")!0
12
140 CALL LINK("DISP",12,3,"T
ype in entry to find:"):: CA
LL LINK("HORZ",15,3,126,36)!
042
150 CALL LINK("DISP",17,3,"P
ath:"):: CALL LINK("DISP",1
```

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User Notes

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```
 8,DR$):: CALL LINK("DISP",1
9,3,"Correct? (Y/N):")!146
160 CALL LINK("ACCEPT",6,14,
-2,"0123456789",D1$):: CALL
LINK("ACCEPT",6,17,-2,"01234
56789",D2$)!074
170 CALL LINK("ACCEPT",6,20,
-2,"0123456789",D3$):: CALL
LINK("DISP",22,3,"Enter endi
ng search date.    ")!158
180 CALL LINK("ACCEPT",9,14,
-2,"0123456789",E1$):: CALL
LINK("ACCEPT",9,17,-2,"01234
56789",E2$):: CALL LINK("ACC
EPT",9,20,-2,"0123456789",E3
$)!057
190 CALL KEY(5,K,S):: CALL L
INK("DISP",22,3,"Enter name,
 word or phrase to locate.")
:: CALL LINK("ACCEPT",14,3,3
5,"",S$)!193
200 CALL LINK("DISP",22,3,"I
nsert the memo disk, enter p
ath.    "):: CALL LINK("ACCE
PT",17,8,-22,"",DR$):: IF DR
$="" THEN 230 !076
210 CALL KEY(3,K,S):: CALL L
INK("ACCEPT",19,18,-1,"/YN",
YN$)!206
220 IF YN$=" " THEN 230 ELSE
 IF YN$="/" THEN 230 ELSE IF
 YN$<>"Y" THEN 100 ELSE
250 !201
230 CALL LINK("DISP",23,3,"
   Insert Program Disk,Press
 F6     ")!060
240 CALL KEY(3,S,K):: IF S=6
 THEN 100 ELSE IF S<>12 THEN
 230 :: ON ERROR 640 :: RUN
"DSK.NP.NPMENU" !207
250 CALL LINK("CLS"):: BD$=D
1$&"/"&D2$&"/"&D3$ :: ED$=E1
$&"/"&E2$&"/"&E3$ :: IF D1$=
"" THEN 100 !195
260 OPEN #1:DR$,INPUT ,RELAT
IVE,INTERNAL :: INPUT #1:F$,
E,E,F1 !221
270 CALL LINK("DISP",2,3,"ME
MO DISK:"):: CALL LINK("DISP
",2,13,F$)!192
280 FOR H=1 TO 127 :: INPUT
#1:G$,D,E,F1 :: CALL KEY(0,K
,S):: H$=STR$(H):: GOSUB 660
 :: IF K=15 THEN 590 !207
290 CALL LINK("DISP",24,6,"B
eg:          End:"):: CALL LI
NK("DISP",24,10,BD$):: CALL
LINK("DISP",24,23,ED$):: CAL
L LINK("DISP",24,38,H$)!136
300 IF LEN(G$)=0 THEN 590 EL
SE IF SEG$(G$,3,1)<>"/" THEN
 590 ELSE IF SEG$(G$,7,2)>E3
$ THEN 620 ELSE 310 !219
310 IF SEG$(G$,7,2)>=D3$ AND
 SEG$(G$,7,2)<=E3$ THEN 320
ELSE 620 !005
320 IF D1$=E1$ THEN 330 ELSE
 340 !216
330 IF SEG$(G$,1,2)=D1$ AND
SEG$(G$,4,2)>=D2$ AND SEG$(G
$,4,2)<=E2$ THEN 360 ELSE 62
0 !066
340 IF SEG$(G$,1,2)=D1$ AND
SEG$(G$,4,2)>=D2$ THEN 360 E
LSE 350 !082
350 IF SEG$(G$,1,2)=E1$ AND
SEG$(G$,4,2)<=E2$ THEN 360 E
LSE 620 !098
360 OPEN #2:DR$&G$,INPUT ,DI
SPLAY ,VARIABLE :: CALL LINK
("DISP",2,8,"Date:"):: CALL
LINK("DISP",2,13,SEG$(G$,1,8
))!087
370 GOSUB 660 :: CALL LINK("
DISP",24,3,"Scanning memo...
")!012
380 LINPUT #2:B$ :: IF EOF(2
)THEN CLOSE #2 :: GOTO 620 !
124
390 IF POS(B$,S$,1)>0 THEN C
LOSE #2 :: GOTO 410 !116
400 GOTO 380 !204
410 GOSUB 660 :: CALL LINK("
DISP",24,3,"Loading..."):: O
PEN #2:DR$&G$,INPUT ,DISPLAY
 ,VARIABLE :: FOR I=1 TO 60
:: LINPUT #2:A$(I):: NEXT I
:: CLOSE #2 :: I=1 !146
420 GOSUB 660 :: CALL LINK("
DISP",24,3,"Searching memo..
."):: IF POS(A$(I),S$,1)>0 T
HEN 440 !153
430 IF I>60 THEN 520 ELSE I=
I+1 :: GOTO 420 !066
440 R=4 :: FOR I=1 TO 19 ::
CALL LINK("DISP",R,1,A$(I)):
: R=R+1 :: NEXT I :: F=1 ::
F$=STR$(F)!186
450 CALL LINK("DISP",2,34,"P
age:")):: CALL LINK("DISP",2,
39,F$)):: GOTO 540 !235
460 CALL LINK("HORZ",4,1,32,
760)):: IF X=13 THEN 620 ELSE
 IF X=49 THEN 440 !033
470 IF F=1 THEN 480 ELSE 500
 !027
480 R=4 :: FOR I=20 TO 38 ::
 CALL LINK("DISP",R,1,A$(I))
:: R=R+1 :: NEXT I :: F=2 ::
 F$=STR$(F)!238
490 CALL LINK("DISP",2,34,"P
age:")):: CALL LINK("DISP",2,
39,F$)):: GOTO 520 !215
500 R=4 :: FOR I=39 TO 57 ::
 CALL LINK("DISP",R,1,A$(I))
:: R=R+1 :: NEXT I :: F=3 ::
 F$=STR$(F)!250
510 CALL LINK("DISP",2,34,"P
age:")):: CALL LINK("DISP",2,
39,F$)):: GOTO 520 !215
520 CALL KEY(0,K,S):: IF K=1
5 THEN 630 !235
530 IF F<1 THEN 620 !106
540 GOSUB 660 :: CALL LINK("
DISP",24,3,"Enter-Next F6-Pa
ge P-Print F9-Exit"):: CALL
KEY(3,X,Y):: IF Y=0 THEN 540
 ELSE IF X=49 THEN 460 !077
550 IF X=15 THEN 590 ELSE IF
 X=12 THEN 460 ELSE IF X=80
THEN 560 ELSE IF X=6 THEN 10
0 ELSE IF X=13 THEN 620 ELSE
 520 !148
560 GOSUB 660 :: CALL LINK("
DISP",24,3,"Printer:PIO"):::
CALL LINK("ACCEPT",24,11,-20
,"",PR$)!221
570 ON ERROR 640 :: OPEN #3:
PR$,OUTPUT :: PRINT #3:TAB(2
0);D$ :: PRINT #3 !094
580 FOR I=1 TO 60 :: PRINT #
3:TAB(20);A$(I):: NEXT I ::
PRINT #3:CHR$(12):: CLOSE #3
 :: GOTO 520 !049
590 CLOSE #1 !151
600 GOSUB 660 :: CALL LINK("
DISP",24,6,"Insert Program D
isk,Press F6"):: CALL KEY(3,
A,B):: IF A<>12 THEN 600 !10
6
610 ON ERROR 640 :: RUN "DSK
.NP.NPMENU" !057
620 F=0 :: CALL LINK("HORZ",
```

(See Page 46)

User Notes

(Continued from Page 45)

```
4,1,32,760):: NEXT H :: GOTO
 590 !108
630 GOTO 590 !159
640 RUN 650 !254
650 GOSUB 660 :: CALL LINK("
DISP",23,2,"Device error!"):
: RUN !100
660 CALL LINK("HORZ",23,3,32
,35):: CALL LINK("HORZ",24,3
,32,35):: RETURN !097
670 CALL LINK("HORZ",1,1,129
,39):: CALL LINK("VERT",1,1,
130,4):: CALL LINK("HORZ",4,
2,131,39):: CALL LINK("VERT"
,1,40,132,4)!239
680 CALL LINK("HORZ",21,1,12
9,39):: CALL LINK("VERT",1,1
,130,24):: CALL LINK("HORZ",
24,2,131,39):: CALL LINK("VE
RT",1,40,132,24):: RETURN !1
97
```

An aptitude test

This comes from Jim Peterson of Tigercub Software. He writes:

This program is much more interesting than its name might suggest. In fact, when I have demonstrated my programs at conventions or in libraries and schools, this one has evoked more interest than any other.

It is based on the "broken block" tests which are often used in IQ and aptitude tests to measure a person's ability to visualize abstract figures, sometimes taken to be an indication of mechanical aptitude. I have found that some very intelligent adults do very poorly with this program, while some children no more than 8 years old do very well!

You are shown nine blue broken blocks on the screen. Two of these blocks can be mentally rotated or flipped, or perhaps both, or occasionally neither, to fit together into a perfect 6x6 square. Since they are designed randomly, there is a remote possibility that more than one pair might match — I calculate this at 1 chance in 46,656.

If you pick the two blocks correctly, both turn red and you receive a salute. If you are wrong, both turn black for a moment while the computer groans in sympathy, then you are shown the correct pair in red.

If you don't have time to key this in, send $3 for a diskful of this and other games to Jim Peterson, 156 Collingwood Ave., Columbia, OH 43213.

```
100 DATA 0000007824242478,00
10301010101038,0038440408102
07C,0038440418044438,0008182
8487C0808,007C407804044438,0
018204078444438 !053
110 GOTO 150 !229
120 SET,D,Q,ST,CH,T,J,X,L(),
LL(),M,N,RX,CX,R,TT,C,RD,K,K
2,F,CH$,N$,M$ !207
130 CALL CLEAR :: CALL CHAR
:: CALL TITLE :: CALL COLOR
:: CALL DELSPRITE :: CALL SC
REEN :: CALL KEY :: CALL HCH
AR :: CALL VCHAR :: CALL SOU
ND !246
140 !@P- !064
150 CALL CLEAR :: CALL TITLE
(2,"MECHANICAL APTITUDE TEST
")! programmed by Jim Peters
on !090
160 FOR D=1 TO 500 :: NEXT D
 :: CALL DELSPRITE(ALL):: CA
LL CLEAR :: CALL SCREEN(16)!
136
170 DISPLAY AT(3,3):"MECHAN
CAL APTITUDE TEST": : :" ":
:" Nine broken blocks will b
e":"placed on the screen." !
004
180 DISPLAY AT(11,1):" Two o
f them can be rotated":"or f
lipped to fit together":"int
o a perfect square." !240
190 DISPLAY AT(15,1):" Type
the numbers of the two":"tha
t go together.": : :" Do you
 want a grid?(Y/N)" !061
200 CALL KEY(3,Q,ST):: IF ST
=0 THEN 200 ELSE IF Q=89 THE
N CALL CHAR(32,"FF8080808080
8080")!205
210 CALL CLEAR :: GOSUB 510
:: CALL SCREEN(11)!232
220 FOR CH=43 TO 107 STEP 8
:: CALL CHAR(CH,"FFFFFFFFFF
FFFFFF")):: NEXT CH !091
230 FOR SET=2 TO 10 :: CALL
COLOR(SET,5,1):: NEXT SET !0
51
240 T=1 :: RANDOMIZE :: FOR
J=1 TO 6 :: X=INT(5*RND+1):.
 L(J)=X :: LL(J)=6-X :: NEXT
```

(See Page 31)

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