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Covering the TI99/4A, the Myarc 9640 and compatibles

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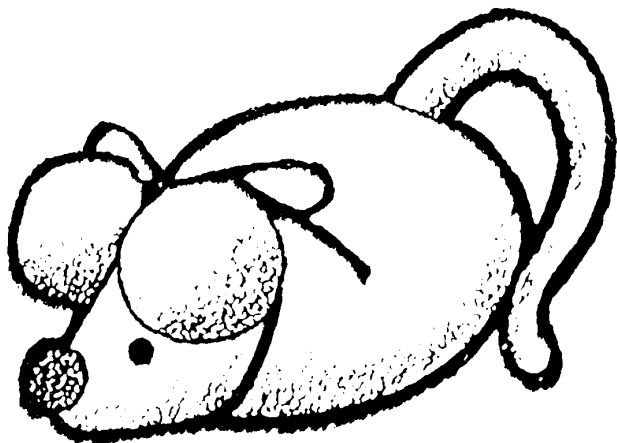
# MICROpendium

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Volume 5 Number 4

May 1988

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**Adding a mouse  
to your TI  
See Page 22**

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### Programming conventions

- Here are some tips to help you when entering programs from MICROpendium:
1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the November 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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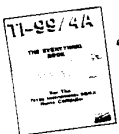
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## Comments

# Delay of MDOS stymies Myarc

If you've ordered a Myarc hard and floppy disk controller you probably haven't received it. Hundreds of the devices are sitting in a room at Myarc's building in New Jersey. Waiting. That's about \$250,000 worth of them, according to Myarc spokesman Jack Riley. While the HFDC was designed to be used with the company's Geneve, it won't. Ironically, it will work with a 99/4A.

According to Riley, "we're still waiting for DSRs from independent programmers." DSR stands for device service routine. DSRs are routines that handle communications between the computer and external devices, such as printers, disk drive, etc. Without them, in the case of the Geneve and the HFDC, a user would be able to load MDOS from the hard disk but after that wouldn't be able to access the hard disk again. Quite a deal.

Those who have ordered a HFDC for use with a 4A, however, may want to contact their dealer or Myarc about having the order expedited since the HFDC will work with a 4A, according to Myarc.

Absent still from what Myarc had hoped would be the final Version 1.1 of MDOS are routines to support the mouse, XOPs (Extended Operation Instructions) and other code that can't be completed until MDOS 1.1 is ready. The absence of these routines threatens the development of most software designed for the Geneve, including GEME (Graphics Enhanced Multi-tasking Environment), PDS (Programmer's Development System), Advanced BASIC, Pascal and John Birdwell's Norton-like utilities.

While development on some of these programs can continue for several weeks, each will reach a point where progress stops when the need to access a mouse or other routine is required. PDS has already reached this point, according to Riley. Advanced BASIC and Pascal are virtually up against the wall. There's still about a month's worth of programming on GEME before it grinds to a halt. And Birdwell's program has about two weeks worth of programming before it requires the non-existent routines.

The bottom line for those involved with the Geneve is that no one is going to get paid for any work they've done developing software until MDOS is finished. That's because they can't finish their programs until another programmer finishes MDOS. Unfortunately, none of them appears to be in a position to do anything about it.

As for timetables, forget about them for now. Until MDOS 1.1 is ready, everything is on hold. It's a sad state of affairs, but at this point not even Myarc is in control.

### THE MY-WORD 'REMINDER' FUNCTION

Does anybody know what the 'R'emind function on MY-Word 1.1 is about? I don't know, and I haven't seen any documentation on it. Try it out. From the command line type R and press Enter. You'll see "REMINDER, enter date:".

Enter a date or press Enter and the program searches DSK1 for a file. You'll see "End of File \* Enter to Continue" at the lower left of the screen. Press Enter again and the cursor returns to the command line.

### NEW DATA BASE READY

TI-BASE, a new data manager that includes its own procedural command language, is being released by Texaments. It is unlike other TI data managers in several ways and is priced at a very reasonable \$24.95 plus shipping. It can handle up to 16,129 records consisting of up to 17 fields with up to 255 characters per field. It seems to be quite fast. The command language, which includes 45 commands, is powerful and allows the user considerable flexibility in creating and using databases. (Up to five databases can be active at one time.) It even comes with a tutorial disk. This program offers exciting potential, and we hope to have a review of it by next month. Stay tuned.

### LAST CALL FOR SOFTWARE FIXES

This will be the final month we'll be soliciting suggestions from Geneve users about the software they'd like to see running on the 9640 that current doesn't. Basically, we're talking about cartridge-based programs that run on the 4A but not on the Geneve. Myarc will take the ten or so most requested programs and write patches for them so that they will run on the Geneve. Send your suggestion to Patches, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

### READER TO READER

We don't get many submissions marked for our Reader to Reader column, but we still get a lot of questions, which we either cannot or don't have time to answer. People may be willing for us to publish their address, but unless they in some way indicate this we are reluctant to do so. So if you have sent us a question that we have not answered and are getting impatient, you might try resubmitting it as a Reader to Reader item.

### NOT IN PHILADELPHIA

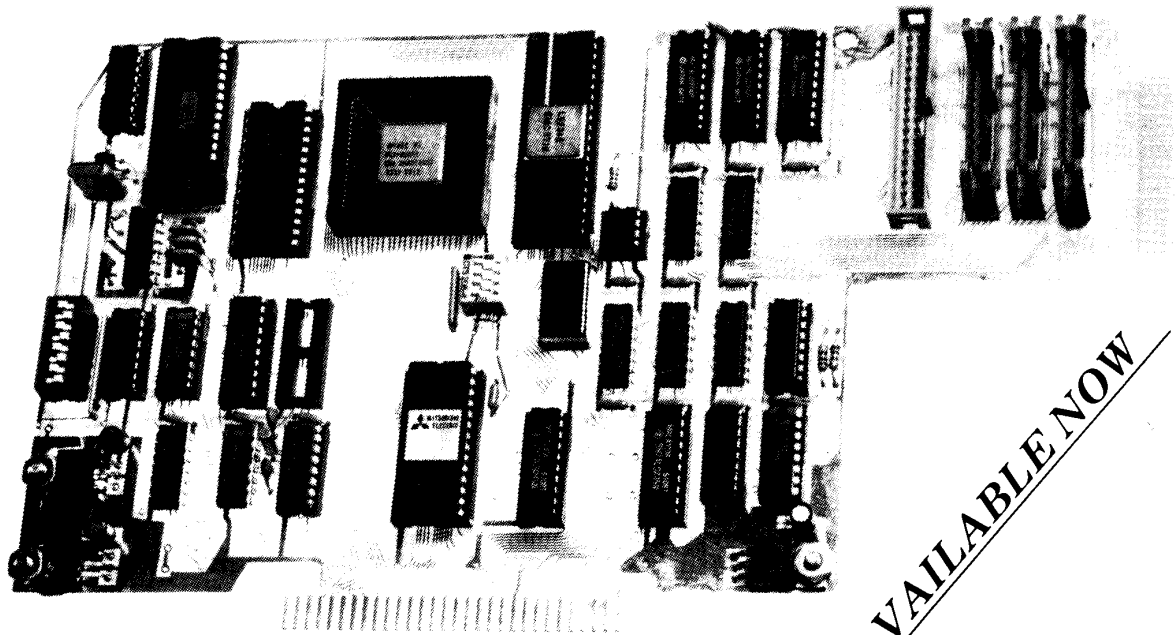
Genial Computerware is located in both Massachusetts and Pennsylvania and our review of PC-Transfer last month gave the latter address when it should have been the former. PC-Transfer may be ordered from Genial Computerware, P.O. Box 183, Grafton, MA 01519. The price is \$25.

### REORDERING MAGAZINE HOLDERS

Once again we've run out of magazine holders. It's difficult to estimate the quantities that need to be ordered because we just don't know how many we can sell. And we can't afford to order a lot of them from the supplier if we're not sure we can sell them. So, we've reordered another supply and will ship them as soon as they arrive. Sometime in June, most likely. We appreciate your patience on this.

—JK

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# Feedback

## Using video chip

In response to Merle Vogt's letter about the 9928A video chip —

If you wish to use either a monochrome monitor or a black and white screen on color composite monitor you merely have to replace the 9918 chip with the 9928. This is a simple operation as the video chip is socketed. This is a fantastic improvement that must be seen to be believed.

A kit is available to allow switching between monochrome and color with this chip but it offers no improvement in color and requires modification of the console.

There is also a kit to use this chip with an RGB monitor but it does not give 80 columns.

I have set up a console with this chip and a \$25 monochrome monitor as a second system to complement my Geneve.

**Rob Halvorson**  
Del Rio, Texas

## Surprised by survey

I was surprised that almost 70 percent of the responses to (Ali Ulgen's) survey indicated that they do not have or plan to purchase a Geneve 9640. I feel it is the best \$480 I have spent on computer hardware (a close second is the Horizon RAMdisk).

Oh, I have "sputtered" a few times while the shipment of the "final copy" of MDOS, etc. was delayed. But I cannot say how much I value and use MY-Word and Multiplan on the Geneve. And I would be the first to say that customer service from Myarc has been *excellent*. Lou Phillips has developed an outstanding personal computer in the Geneve. I don't mean to offend anyone, but if you don't have a Geneve, I think you're missing something important.

**Paul Flesner**  
Prospect Heights, Illinois

## DM1000 shareware contributions asked

In recent advertising in your publication, Tex-Comp has stated that they will give away a "free" copy of DM1000 with the purchase of "The Explorer," one of their own software packages. DM1000 is shareware. While we encourage its distribution, particularly through users' groups and pub-

lic bulletin board systems, we are concerned that some of Tex-Comp's customers may draw the wrong conclusion from the wording of the advertisement. We would like these people to know there is no association between Tex-Comp and the Ottawa TI99/4A Users' Group, and we do not receive any royalties or shareware fees from Tex-Comp for the copies of DM1000 so given away. Thus, the obligation as shareware users of persons who receive it from Tex-Comp is exactly the same as if they downloaded it from a bulletin board or obtained it through a users' group library.

DM1000 helps us finance such activities as our newsletter exchanges and our annual TI Fest.

**Michael Taylor**  
President, Ottawa TI99/4A Users Group  
Ottawa, Ontario, Canada

## New version out of TI-Artist

It would be of interest to your readers to know that there is a new version of TI-Artist. Version 2.01-G is "fixed" for use on the Geneve.

All routines work properly on the Geneve and some are improved from the V-2.0 I was using. The print routine allows more sizes and densities on my Prowriter. Pictures and color can be erased from the enhancement. A Mouse DSR for the Mechatronics Mouse is included but Geneve users must use the one published in your mag. One of the most important features of V-2.01 is use on a RAMdisk or hard disk. Be warned that to use with one of these you must use option 3 of Editor/Assembler or Load and Run of Mini-Memory or a similar loader. When used with Extended BASIC the default will always be "DSK. INSCEBOT."

**Don Alexander**  
Macon, Georgia

## Programs from users' groups

We have a sort of informal users group here in Great Falls, Montana, and just help each other out a little from time to time but we have a small or "large to us" complaint. It is about users groups who are mentioned and supposedly available to procure pro-

grams from.

I have personally been waiting since December (for a program) for which I sent a check to purchase. My check was cashed but I have as yet to hear from them in any way telling me it was going to be a while or whatever but this same type of thing has happened to many of us here in Great Falls with various users groups around; even when they have sent stamped self addressed envelopes they haven't received replies.

We all understand that users groups are just that, a users group with a lot of talented people, but these are our only means of keeping the TI alive and if we ignore helping those who need the help and are willing to pay for it, the TI won't keep going.

**Edward D. Trapp**  
Great Falls, Montana

## 'Extra mile' and more

Usually if a person has a bad experience, it tends to stick with them. Recently, I had an experience that was so good that it stuck with me.

Not too long ago, I did run into a problem, and luckily I was dealing with a company that not only went the "extra mile" to be helpful, but probably went an extra two or three miles. I'd like to publicly thank Jerry Price of Tex-Comp for his excellent customer service. Tex-Comp really stands behind their products and goes out of their way to satisfy the customer. I'm more than satisfied; I'm grateful!

**Shirley Slicer**  
Olathe, Kansas

## More vendor praise

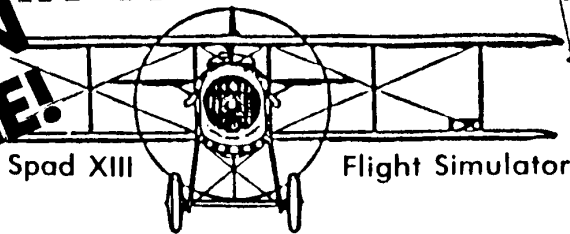
Since 1983 I have been subject to nearly every kind of service for the TI possible. I would like to take this opportunity to tell your readers of one that I have found to be exceptional. I bought a set of drives about a month ago from L&M Systems, 2330 East Ave., Lancaster, California. Since then the owner has called my home at his expense not once but three times to see how I was getting along. He has sent me software and updates for my 9640 at no charge and without being asked (with my order). What a pleasure to be treated in this manner.

**Lonnie D. Courson**  
Danville, Illinois

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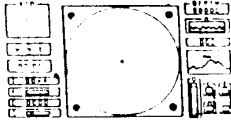
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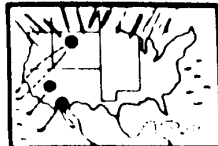


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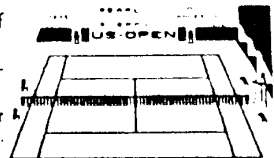
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## BASIC

# Take me out to the ball game

By REGENA

First, I have an enhancement for last month's program, "San Francisco Tourist Revisited." My friend Ray Kazmer noticed that at the end of a game, if you are pressing a key used in the game, you can easily go right past the scoring message and the message to press any key to continue. Subroutine 36 uses CALL KEY(0,K,S). Theoretically, if the status S=1, a new key is pressed; if S=-1, the same key is being pressed; and if S=0, no key is pressed. However, checking this status does not always work (it does not work in the game program but does work in this month's program).

A change would be to press a key that is not being used in the game. Change Lines 36 and 38:

```
36 PRINT "PRESS <SPACE BAR>";
38 IF (S<1)+K<>32) THEN 37
```

Now the space bar (instead of any key) needs to be pressed to continue the program.

This month I have started going to baseball games. Our town is a small town that LIVES baseball during the spring and early summer. No longer do people even think about an evening meal; everyone is at the ballpark. Many of the "baseball moms" keep track of their sons' individual statistics. Since I have three sons playing ball this year (that's not counting Brett Lynn, who always has a ball in his hand but isn't old enough to play on an organized team), I thought the computer could help track of things.

It has been quite a while since I published a file processing type of program, so I thought you could look at this program and get some ideas of your own. You may want to use this program to keep track of batting statistics for some of the major league players. Either customize this program for your own use in baseball statistics, or use the general idea for something in your special interests.

This program is written in TI BASIC. You may use either a cassette system or a disk system for storage. If you are using the disk system, save the main program as BATTING. When you run the program, you can create different data files for each individual player. For example, I use RICHARD1, RICHARD2, BOB and RANDY. (RICHARD1 is for his varsity team and RICHARD2 is for his junior varsity team.) If you use a cassette system, keep the main program on one cassette, then use a different cassette for each player's data.

After each game, you can update the player's offensive data and then see the total number of times at bat, the batting average (number of hits divided by the number of times at bat), the slugging percentage (the number of bases — single, double, triple, home run — divided by the number of times at bat, including walks, errors, and fielder's choices), the total RBIs (runs batted in), the total runs scored and totals of each of the possibilities of batting.

The first time you run the program (after the player's first game), you will need to select "I START NEW PLAYER", choose the cassette or diskette system and type in the name of the player. The computer shows the game number (the first time, it is GAME 1). The computer then prints the time at bat and shows a choice of 10 possibilities.

If you select one of the first four choices, Single, Double, Triple or Home Run, a hit is tallied. A base on balls (walk) is ignored

in the batting average but is counted in on-base percentage. A base on error or a base on fielder's choice counts as an out on batting average and slugging percentage but counts as a base in on-base percentage.

The next item to enter is the number of runs batted in (RBI). Press a number from 1 to 4. If the player made it on base, you will also be asked for the number of stolen bases and if the batter scored. If the player hits a home run, these two questions will not be asked.

The program then clears the screen and goes to the next time at bat. When a player has no more times at bat, press the ENTER key. The data will be saved. The statistics will then be printed.

After the second game or later games, when you run the program, select "2 LOAD PREVIOUS RECORDS"; then either put in the correct cassette or type in the appropriate player's name. All previously stored information will be retrieved, then you add the latest game statistics.

If you just want to view a player's statistics without adding more information, simply press ENTER at the first "AT BAT: 1" prompt.

Lines 130-150 read in the 10 choices from the data in Lines 160-170. Lines 180-250 print the first menu screen and branch according to the choice. Lines 260-330 are the subroutine to choose cassette or diskette. Lines 340-500 are the subroutine to enter a player's name A\$ and define D\$ for cassette or diskette. Lines 510-520 are the subroutine to round the decimal fraction to three decimal places.

Lines 530-560 are used to set up a new player's information with the first game. Lines 570-690 load previous information for a player. Line 700 defines the game number, GAME. Line 710 initializes the variable ABG for the number of times at bat in the game. Lines 730-750 print the header information.

Lines 760-800 print the 10 batting options, then Lines 810-850 receive the response, BAT. Line 860 updates the total for the choice, STAT(BAT). Line 870 increments the "At Bat" total, AB, which does not include walks. Line 880 increments the total of times at bat, ABT, which includes walks.

Line 890 branches if "0" was chosen, which is an out. Lines 890-930 determine if a hit was made, and if so increments the number of hits, HITS, and calculates the variable for slugging percentage, SLUG (1 for single, 2 for double, 3 for triple, 4 for home run.)

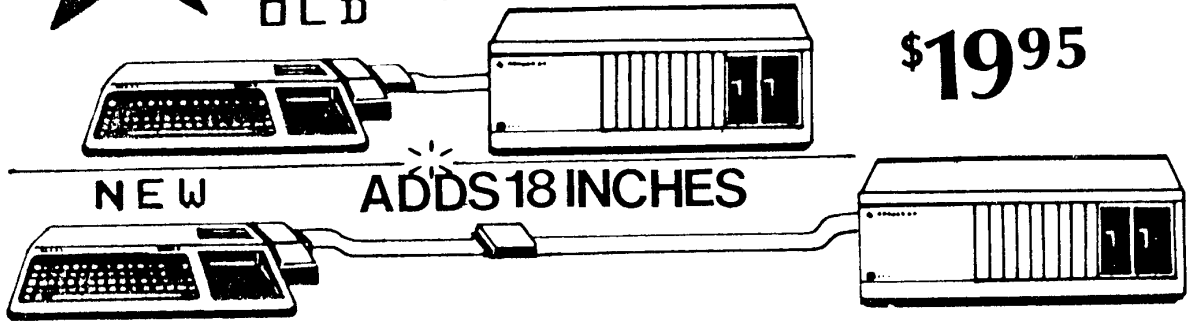
Lines 940-950 determine if a base on balls occurred and adjust the AB total. Lines 960-970 increment the on-base total, OB, for on-base percentage. Lines 980-1040 determine if there were runs batted in, RBI. Lines 1050-1140 determine stolen bases, SB, if the batter made it on base and did not hit a home run. Lines 1150-1220 increment the number of runs, RUNS, if the batter scored.

Line 1230 increments the time at bat for the game, and Line 1240 branches back to Line 720. When batting is completed, Lines 1250-1400 save the information on cassette or diskette. Lines 1410-1650 print the individual player's statistics, and Line 1660 ends the program.

If you prefer to save typing effort, you may have a copy of this program by sending \$3 plus a blank cassette or diskette and a stamped, self-addressed mailer to REGENA, P.O. Box 1502, Cedar City UT 84720. Be sure to specify the title "Batting Statistics" and that you need the TVersion.

# NEW P-BOX EXTENSION

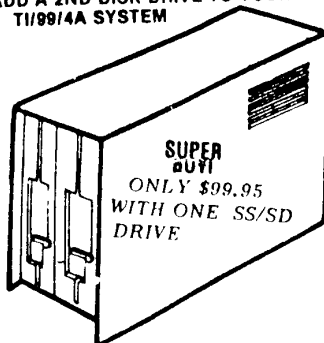
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## REGENA—

(Continued from Page 10)

```

100 REM BATTING !227
110 CALL CLEAR !209
120 PRINT "  BATTING STATIS
TICS" !012
130 FOR J=0 TO 9 !064
140 READ B$(J)!180
150 NEXT J !224
160 DATA PUT OUT,SINGLE,DOUB
LE,TRIPLE,HOME RUN,BASE ON B
ALLS,BASE ON ERROR !252
170 DATA BASE ON FIELDER'S C
HOICE,SACRIFICE FLY OR BUNT,
STRIKE OUT !008
180 PRINT : : "CHOOSE:" !13
2
190 PRINT : "1  START NEW PLA
YER" !033
200 PRINT : "2  LOAD PREVIOUS
RECORDS" !145
210 PRINT : "3  END PROGRAM":
: : !124
220 CALL KEY(0,K,S)!187
230 IF (K<49)+(K>51)THEN 220
!240
240 CALL CLEAR !209
250 ON K-48 GOTO 530,570,166
0 !247
260 PRINT : : "CHOOSE:" !207
270 PRINT : "1  CASSETTE SYST
EM" !252
280 PRINT : "2  DISKETTE SYST
EM" !254
290 CALL KEY(0,K,S)!187
300 IF S<1 THEN 290 !044
310 IF (K<49)+(K>50)THEN 290
!064
320 STOR=K-48 !073
330 RETURN !136
340 PRINT !156
350 GOSUB 260 !085
360 A$="" !234
370 IF STOR=2 THEN 470 !214
380 PRINT : : "ENTER FILE NAM
E TO BE USED" !161
390 PRINT "(EIGHT LETTERS),
SUCH AS" !179
400 PRINT "THE PLAYER'S NAME
.": : !075
410 INPUT A$ !247
420 IF A$="" THEN 380 !100
430 IF LEN(A$)<9 THEN 450 !0
40
440 A$=SRC$(A$,1,8)!046
450 D$="DSK1."&A$ !080
460 GOTO 500 !068
470 PRINT : : "ENTER PLAYER'S
NAME" !006
480 INPUT A$ !247
490 D$="CS1" !183
500 RETURN !136
510 P=INT(1000*(P+.0005))/10
00 !041
520 RETURN !136
530 PRINT "NEW PLAYER INFORM
ATION" !182
540 GOSUB 340 !165
550 GAME=1 !210
560 GOTO 710 !023
570 PRINT "LOAD PREVIOUS INF
ORMATION" !159
580 GOSUB 340 !165
590 IF STOR>1 THEN 620 !109
600 OPEN #1:D$,INTERNAL,INPU
T,FIXED 192 !180
610 GOTO 630 !199
620 OPEN #1:D$,INTERNAL,INPU
T,VARIABLE !070
630 INPUT #1:A$ !163
640 INPUT #1:GAME,AB,ABT,HIT
S !003
650 FOR J=0 TO 9 !064
660 INPUT #1:STAT(J)!049
670 NEXT J !224
680 INPUT #1:RBI,SB,RUNS,SLU
G,OB !144
690 CLOSE #1 !151
700 GAME=GAME+1 !173
710 ABG=1 !130
720 CALL CLEAR !209
730 PRINT A$ !001
740 PRINT : "GAME":GAME !004
750 PRINT : : "AT BAT: ";ABG:
: !163
760 FOR J=1 TO 9 !065
770 PRINT J;" ";B$(J)!083
780 NEXT J !224
790 PRINT " 0 PUT OUT" !015
800 PRINT "<<ENTER> FOR NO MO
RE BATTING" !182
810 CALL KEY(0,K,S)!187
820 IF S<1 THEN 810 !064
830 IF K=13 THEN 1250 !026
840 IF (K<48)+(K>57)THEN 810
!070
850 BAT=K-48 !216
860 STAT(BAT)=STAT(BAT)+1 !1
21
870 AB=AB+1 !127
880 ABT=ABT+1 !039
890 IF BAT<1 THEN 980 !100
900 IF BAT>4 THEN 940 !064
910 HITS=HITS+1 !233
920 SLUG=SLUG+BAT !204
930 GOTO 970 !028
940 IF BAT>5 THEN 960 !085
950 AB=AB-1 !128
960 IF BAT>7 THEN 980 !107
970 OB=OB+1 !155
980 PRINT : : "OTHER STATISTI
CS:" !197
990 PRINT : : "NUMBER OF RUNS
HATTED IN:" !145
1000 CALL KEY(0,K,S)!187
1010 IF S<1 THEN 1000 !244
1020 IF (K<48)+(K>52)THEN 10
00 !255
1030 CALL HCHAR(23,29,K)!082
1040 RBI=RBI+K-48 !124
1050 IF BAT>7 THEN 1230 !102
1060 IF BAT<1 THEN 1230 !095
1070 IF BAT=4 THEN 1220 !087
1080 PRINT : : "NUMBER OF STO
LEN BASES:" !031
1090 CALL KEY(0,K,S)!187
1100 IF S<1 THEN 1090 !079
1110 IF (K<48)+(K>51)THEN 10
90 !089
1120 IF ((BAT<4)+(K>52-BAT))
=-2 THEN 1090 !046
1130 CALL HCHAR(23,27,K)!080
1140 SB=SB+K-48 !236
1150 PRINT : : "DID BATTER SC
ORE?" !108
1160 PRINT " 1 YRS" !046
1170 PRINT " 2 NO" !218
1180 CALL KEY(0,K,S)!187
1190 IF S<1 THEN 1180 !169
1200 IF (K<49)+(K>50)THEN 11
80 !179
1210 IF K=50 THEN 1230 !007
1220 RUNS=RUNS+1 !009
1230 ABG=ABG+1 !013
1240 GOTO 720 !033
1250 PRINT : : "GAME STATISTI
CS COMPLETE" !163
1260 IF ABG=1 THEN 1390 !242
1270 PRINT : : "SAVING INFORM
ATION" !013
1280 IF STOR>1 THEN 1310 !03
4
1290 OPEN #2:D$,INTERNAL,OUT
PUT,FIXED 192 !026
1300 GOTO 1320 !124
1310 OPEN #2:D$,INTERNAL,OUT
PUT,VARIABLE !172
1320 PRINT #2:A$ !174

```

(See Page 14)

# TI ARTIST



## Software Support



### ARTIST'S COMPANION #1

The Artist's Companion that started it all Artist's Companion #1 is a huge five disk set that adds a complete collection of graphic designs to be used in conjunction with TI Artist. It consists of 25 fonts, 160 small pictures (instances), and 30 large instances. Each font and picture can be altered and interfaced with any picture or design of your choice using the TI Artist. Requires: TI Artist or another compatible graphics package. **Only \$17.95**

### ARTIST'S COMPANION #4

Keep on expanding your TI Artist graphic library with Artist's Companion #4! This two disk package contains 15 new outrageous fonts and 15 small original pictures (instances). Some of the fonts included with Artist's Companion #4 are Artdeco, Cameo, and Starlet. Requires: TI Artist (V2.0 or greater) or another compatible graphics package. **Only \$9.95**

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**GRAPHICS**



### ARTIST'S COMPANION #2

Artist's Companion #2 is the second in a series of supplemental graphics packages for the TI Artist drawing system. The two disk set includes of 13 fonts and 60 small pictures (instances). Also included is Artist's Connection, a program generator that allows TI Artist pictures and clip art to be used in BASIC and Extended BASIC programs. Requires: TI Artist or another compatible graphics package. **Only \$9.95**

### ARTIST'S COMPANION #5

This two disk set includes a complete array of new and original fonts and clipart for TI Artist. Several of the fonts are exceptional... Barcode, Ballon, and an all new 3D font. Two small fonts are included which are excellent for those "small jobs". Artist's Companion #5 contains a total of 16 fonts and 12 instances. Requires: TI Artist or another compatible graphics package. **Only \$9.95**

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## Trials of a c99 beginner

## A dictionary file

By CHARLES E. KIRKWOOD JR.

Most of you probably realize by now that I enjoy puzzles. It could be that I enjoy writing a program to help solve the puzzle as much as solving it. The c99 language lends itself well for solving this type of problem — characters and integers can be manipulated with ease, and the execution time is fast. For those who are not puzzle fans, the puzzle program offers techniques that are applicable to many types of programs.

This month the Scramble program (see example 3 of c99 article, November 1987, MICROpendium) will be modified to use dictionary files to find the solution. The program offers an extension to the I/O files from last month's c99 article. Twenty-six dictionary files will be used; but only one at a time. There will be one file for each letter of the alphabet named A, B, C, ..., Z. Five and six letter words are stored in these files. To speed up the run time, each word will have a field width of six, starting with column one, such as:

```
ABACK ABACUSABAFT ABASE ABASH ABATE ABATISABESS ABBEY ABBOT
ABDUCEABDUCTABEAM
ABELE ABHOR ABIDALABIDE ABJECTABJUREABLAUTABLAZEABLUSHABOARD
ABODE ABOMA ABOON
etc.
```

Each word is left-justified in the field. The only spaces are those following the five-letter words and at the end of the record. This will pack the maximum number of words into each record. When the first letter of the scrambled word is A, only the A file is searched for a match. The program will continue the search to find all possible solutions to the puzzle. The speed can be increased further if the five-letter words are in one file and the six-letter words are in another file. That, of course, would necessitate 52 dictionary files rather than 26. The program can then be modified to use the five-letter files for the five-letter scramble and the six-letter words for the six-letter scramble.

The first letter of the scrambled letters is used to decide which dictionary file to search. Several methods were tried to supply the file name for the open statement:

```
in=fopen(name,"r");
```

One method that I thought might work was to concatenate DSK1 with the first letter. The concatenation worked, but I could not get the concatenated word to work as the argument. An array was finally set up in which the ASCII values of A, B, C, ... were the subscript values, like:

```
file[65]="DSK1.A";
file[66]="DSK1.B";
```

etc.

```
B/*SCRAMBLE WITH DICTIONARY PROGRAM*/
#include DSK1.STDIO
char x[7];
int file[91];
main()
{
  char w[7];
  int a,i,j,k,m,n,nc,r,s;
  puts("SCRAMBLE WITH DICTIONARY PROGRAM\n");
  puts("Charles E. Kirkwood, Jr. 29633\n");
  putchar(10);
  puts("Type 6 LETTERS \n");
  puts("or A SPACE AND 5 LETTERS\n\n");
  i=1;
  file[65]="DSK1.A";
  file[66]="DSK1.B";
  file[67]="DSK1.C";
  file[68]="DSK1.D";
  file[69]="DSK1.E";
  file[70]="DSK1.F";
```

(See Page 16)

## REGENA—

(Continued from Page 12)

```
1330 PRINT #2: GAME,AB,ABT,HITS !014
1340 FOR J=0 TO 9 !064
1350 PRINT #2: STAT(J)!060
1360 NEXT J !224
1370 PRINT #2: RBI,SB,RUNS,SLUG,OB !155
1380 CLOSE #2 !152
1390 IF ABG>1 THEN 1410 !008
1400 GAME=GAMR-1 !174
1410 CALL CLEAR !200
1420 PRINT A$ !001
1430 PRINT : "AFTER";GAME;"GAME(S)" !157
1440 PRINT : : "NUMBER OF TIM
```

```
ES AT BAT =" ;AB !069
1450 P=HITS/AB !141
1460 GOSUB 510 !079
1470 PRINT : : "BATTING AVERAGE =" ;P !009
1480 P=SLUG/AB !144
1490 GOSUB 510 !079
1500 PRINT : "SLUGGING PERCENTAGE =" ;P !236
1510 P=OB/ABT !058
1520 GOSUB 510 !079
1530 PRINT : "ON BASE PERCENTAGE =" ;P !009
1540 PRINT : : "RBI TOTAL =" ;RBI !071
1550 PRINT : : "RUNS SCORED =
```

```
";RUNS !091
1560 PRINT : : : !187
1570 PRINT "PRESS <ENTER> TO CONTINUE" !105
1580 CALL KEY(0,K,S)!187
1590 IF K<>13 THEN 1580 !009
1600 CALL CLEAR !200
1610 PRINT " ** TOTALS **" : : !251
1620 FOR J=1 TO 9 !065
1630 PRINT B$(J);TAB(25);STAT(J)!174
1640 NEXT J !224
1650 PRINT B$(0);TAB(25);STAT(0): : !043
1660 END !139
```



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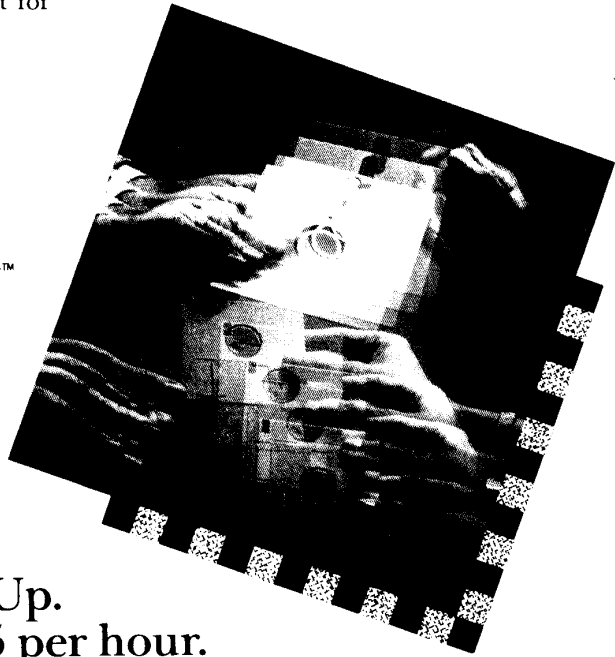
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c99—

(Continued from Page 14)

```

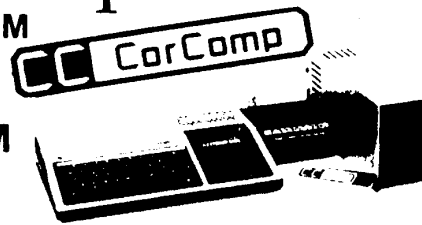
file[71]="DSK1.G";
file[72]="DSK1.H";
file[73]="DSK1.I";
file[74]="DSK1.J";
file[75]="DSK1.K";
file[76]="DSK1.L";
file[77]="DSK1.M";
file[78]="DSK1.N";
file[79]="DSK1.O";
file[80]="DSK1.P";
file[81]="DSK1.Q";
file[82]="DSK1.R";
file[83]="DSK1.S";
file[84]="DSK1.T";
file[85]="DSK1.U";
file[86]="DSK1.V";
file[87]="DSK1.W";
file[88]="DSK1.X";
file[89]="DSK1.Y";
file[90]="DSK1.Z";
while(i<6)
{
  a=getchar();
  w[i]=a;
  ++i;
}
nc=6;
if(w[1]==32)
  nc=1;
for(i=1;i<nc;++i)
{
  for(j=1;j<=6;++j)
  {
    if(j!=1)
    {
      for(k=1;k<=6;++k)
      {
        if((k!=i)&(k!=j))
        {
          for(m=1;m<=6;++m)
          {
            if((m!=i)&(m!=j)&(m!=k))
            {
              for(n=1;n<=6;++n)
              {
                if((n!=i)&(n!=j)&(n!=k)&(n!=m))
                {
                  for(r=1;r<=6;++r)
                  {
                    if((r!=i)&(r!=j)&(r!=k)&(r!=m)&(r!=n))
                    {
                      x[0]=w[i];
                      x[1]=w[j];
                      x[2]=w[k];
                      x[3]=w[m];
                      x[4]=w[n];
                      x[5]=w[r];
                      if(x[0]==32)
                      {
                        for(s=0;s<5;++s)
                          x[s]=x[s+1];
                          x[5]=32;
                        search();
                      }
                    }
                  }
                }
              }
            }
          }
        }
      }
    }
  }
}
search()
{
  int b,in,col,k,t,d,e,f;
  char buff[81];
  col=81;
  e=x[0];
  f=file[e];
  in=fopen(f,"r");
  b=fgets(buff,col,in);
  while(b)
  {
    k=fndwr(d,b);
    if(k==1)
    {
      putchar(10);
      for(t=0;t<6;++t)
      {
        d=x[t];
        putchar(d);
      }
      b=fgets(buff,col,in);
    }
    fclose(in);
    return;
  }
  fndwr(b)
  char b[];
  {
    int i,j,s,k,c;
    for(j=0;j<=72;j=j+6)
    {
      s=0;
      while((s<6)&(x[s]==b[j+s]))
        ++s;
      if(s==6)

```

(See Page 18)

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c99—

(Continued from Page 16)

```

{
  k=1;
  return(k);
}
k=0;
return(k);
}

```

This program will give the disk drive quite a workout. If you have a RAMdisk, store the dictionary files in the RAMdisk and the program is so much faster. You might use a Scrabble dictionary for a start in building your dictionary files. There is always the chance that the solution to the puzzle might not be in your dictionary files. If it isn't, go back and use the original Scramble program mentioned earlier and print all combinations on the screen. When you figure out the solution, add this new word to your dictionary files.

Warren Agee submitted a c99 tip to the TI Forum in the Computer Shopper. The two functions `atoi()` and `itoi()` are also part of the `PRINTF` library. The function `atoi()` converts an ASCII string to an integer and `itoi()` converts an integer to a decimal string. So it may not be necessary to add the `CONV;C` library when `printf()` is used in a program. Before `main()` include the statement:

```
extern printf(),atoi(),itoi();
```

An update to Release 3 of c99 for the TI99/4A and the Myarc 9640 (running in GPL mode) is available from Clint Pulley, 38 Townsend Ave., Burlington, Ontario, Canada L7T 1V6. A few of the improvements will be mentioned. True logical operators (double ampersand and `)` are included. The compilation is faster and also a faster run time. The object program takes up less space. There is a form of `goto` that can be used where it is absolutely necessary. Pointer arrays are available.

Either the double ampersand or the single ampersand may be used for AND in the Scramble program using the new version of c99. Only the single ampersand is allowed using previous versions.

For those who would like to get started with c99, send two formatted diskettes (SSSD) in a mailer and \$1 for return postage to Clint Pulley. If you find c99 useful and use it, a donation to Clint is suggested.

About 20 years ago I read in the ACM Journal about two one-line functions that could be used with a program to calculate the day of the week a month started and the number of days in a month. I do not remember who developed the functions. These functions in FORTRAN were:

```
IZLR(I,J,K)=MOD((13*(J+10-(J+10)/13*(12))-1)/5+K+
77+5*(I+(J-14)/12-(I+(J-14)/12)/100*(100))/4+(I+
(J-14)/12)/400-(I+(J-14)/12)/100*2,7)
```

```
JD(I,J,K)=K-32075+1461*(I+4800+(J-14)/12)/4+367*
(J-2-(J-14)/12*(12))/12-3*((I+4900+(J-14)/12)/100)/4
```

The integer arithmetic is for a mainframe computer with at least a 32-bit (4-byte) word. I wrote a program to go with these functions, first for a 132-column line printer and then modified it for a terminal printer.

```
COL. NO. 111111111122222222223333333333444444444455555555556
123456789012345678901234567890123456789012345678901234567890
```

```
CHARACTER*9 NAME(12) / 'JANUARY', 'FEBRUARY', 'MARCH',
X, 'APRIL', 'MAY', 'JUNE', 'JULY', 'AUGUST',
X 'SEPTEMBER', 'OCTOBER', 'NOVEMBER', 'DECEMBER' /
CHARACTER*4 LANK / ' ' /
```

```
C
IZLR(I,J,K)=MOD((13*(J+10-(J+10)/13*(12))-1)/5+K+77+5*
X(I+(J-14)/12-(I+(J-14)/12)/100*(100))/4+(I+(J-14)/12)/
I400-(I+(J-14)/12)/100*2,7)
```

```
C
JD(I,J,K)=K-32075+1461*(I+4800+(J-14)/12)/4+367*(J-2
X-(J-14)/12*(12))/12-3*((I+4900+(J-14)/12)/100)/4
```

C

38

FORNAY(14)

2

```
FORNAY(11,///,T39,49,/,T42,14,/,T18,'SUN',5X,'MON',
15X,'TUE',5X,'WED',5X,'THU',5X,'FRI',5X,'SAT',/,T5,
T8,18,T5,8AB)
```

43

FORNAY(' ',T13,T18)

C

5

READ(1,38,END=90)IY

DO 10 I=1,12

LN=JD(IY+I/12,MOD(I+1,13)+I/12,1)-JD(IY,I,1)

LF=IZLR(IY,I,1)+1

LK=0-LF

WRITE(3,41) MOD(I,4),NAME(I),IY,(J,J=1,LF),

X(JJ,JJ=1,LF),(LANK,J=1,LF)

WRITE(3,43) (J,J=JJ,LF)

10 CONTINUE

GO TO 5

90

STOP

END

After I bought my TI99/4A this program was written in Extended BASIC in 10 computer lines. (See program at the end of this article.)

The two functions were combined into the same subroutine. The arithmetic was tricky, since XBASIC uses real arithmetic and there is no modulo. The INT function was used to eliminate the digits after the decimal point. The BASIC calendar program can be combined with one of the font or drawing programs to produce a custom calendar.

Now, it might seem like this would be an ideal problem for c99. It would be except for one fact — some of the integer values in the function `CD()` function exceed two bytes of storage.

Tom Bently has written a floating point (real) library for the c99. A real number is stored as an 8-byte number. This library is included with the c99 compiler. Also, a very important feature of c99 is the ability to integrate assembly language within the program. With assembly language an integer can be set up as a 4-byte number rather than two.

(See Page 19)

c99 —

(Continued from Page 18)

The c99 version of the calendar program will be included with next month's c99 article, I hope!

*Readers with questions about any of the examples in c99 articles is encouraged to write the author at Box 1241, Clemson, SC 29633.*

```
10 DIM M$(12):: M$(1)="JAN"
:: M$(2)="FEB" :: M$(3)="MAR"
" :: M$(4)="APR" :: M$(5)="M
AY" :: M$(6)="JUN" :: M$(7)=
"JUL" :: M$(8)="AUG" !198
20 M$(9)="SEP" :: M$(10)="OC
T" :: M$(11)="NOV" :: M$(12)
="DEC" :: L$=" " :: LL$=
" " :: INPUT "YEAR ":
Y :: OPEN #1:"PIO" !214
```

```
30 FOR I=1 TO 12 :: A=INT(Y+
I/12):: B=I+1-INT((I+1)/13)*
13+INT(I/12):: GOSUB 80 :: L
M=BD :: A=Y :: B=I :: GOSUB
80 :: LM=LM-BD :: LF=AZ+1 !1
81
40 LE=8-LF :: PRINT #1:TAB(3
9);M$(I);" ";Y :: PRINT #1 :
: PRINT #1:TAB(18);"SUN";L$;
"MON";L$;"TUE";L$;"WED";L$;
"THU";L$;"FRI";L$;"SAT" !190
50 PRINT #1:TAB(19):: FOR J
=1 TO LF-1 :: PRINT #1:LL$;:
: NEXT J :: FOR K=1 TO LE ::
PRINT #1,USING "## ####":K
," " :: NEXT K :: PRINT #1 !
247
60 PRINT #1:TAB(19):: N=1 :
: FOR J=K TO LM :: PRINT #1,
```

```
USING "## ####":J," " :: S=
N-INT(N/7)*7 :: N=N+1 :: IF
S=0 THEN PRINT #1:TAB(19);!0
87
70 NEXT J :: PRINT #1: : :
:: NEXT I :: CLOSE #1 :: EN
D !080
80 IF B>2 THEN D=0 ELSE D=-1
!107
90 E=A+D :: BZ=INT((13*(B+10
-INT((B+10)/13)*12)-1)/5)+78
+INT(5*(E-INT(E/100)*100)/4)
+INT(E/400)-INT(E/100)*2 !13
4
100 AZ=BZ-INT(BZ/7)*7 :: BD=
INT(-32074+INT(1461*(A+4800+
D)/4)+INT(367*(B-2-D*12)/12)
-INT(3*(INT((A+4900+D)/100)/
4)) :: RETURN !168
```

Exploring your printer

## Control characters and fonts

By LOU BORRELLI

*The following is the first of a series of articles the author wrote for the CIM 99 monthly newsletter. CIM 99 is a Montreal-based TI Users Group and stands for Club Informatique Montreal.—Ed.*

In the early ages of writing, Monks dedicated their lives to publishing books or documents by writing everything by hand (there was no other choice). They even used their creativity by developing fancy script. Today, the same documents can be reproduced in minutes compared to the number of years that it took them. The 1980s allows for the use of typewriters to facilitate the writing of books, letters and documents. The word processor is an even better invention, which helps to avoid wasting paper. Corrections are made directly on screen then saved on a diskette for later reference or output.

As a computer owner, word processing has become a necessity for communication. The words you are now reading were produced with a word processor. Which one? TI-Writer, of course!

The object of these tutorials is not to rewrite the manual but to expose readers to some commands that I've found useful while working in the Editor mode of TIW.

### Font examples

Regular Print or Font is set for 10 CPI (Characters/Inch)  
Compressed is set for 17 CPI

Double Width is set for 5 CPI

My philosophy is to "Get the Most Out of What You Already Have."

The special codes I will be referring to are based on my printer, Gemini 10X and TI-Writer. As far as I know, all Epson and Epson compatibles follow the same protocol as Gemini. The interface used is in parallel to free the RS232 serial interface for modem communications. It is assumed that most of the readers access their printers using PIO and have an Epson-compatible printer. Even if your system is not configured in this way, I'm hoping that you will be able to take the information and adapt it to your setup.

TI-Writer has a 3 option menu:

1. Editor — text creation
2. Formatter — text print out with special commands
3. Utility — similar to Editor/Assembler No. 5

The object of this and forthcoming articles will be to give you a little insight on your printer and how to access many of its capabilities without going through the Formatter section. That's Right! Special

printer capabilities through use of the Editor mode.

Let me start off by giving you a few simple examples.

Regular print or font is set for 10 CPI (characters per inch)

Compressed is set for 17 CPI

Double width is set for 5 CPI

The commands required for accessing these fonts are:

Control U Shift O Control U selects compressed.

Control U Shift R Control U cancels compressed.

Control U Shift N Control U selects double width.

Control U Shift T Control U cancels double width.

Note that double width will also be cancelled once the printer goes to a carriage return (new line of print).

Take the opportunity now to fool around with these controls. Get a feel for your printer's capabilities. Next month I'll discuss the first 32 ASCII (control) codes and what they do.

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GAMES	UTILITIES	GRAPHICS	ACCOUNTING AND FINANCE	SECURITY/HACKING
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## SERIES I

### #1. "THE SINGING TI-99/4A" SPEECH & MUSIC DEMO DISK

This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Matilda & much much more. 2 disk sides-speech & 32K req.

### #2. WHEEL OF FORTUNE, BLACKJACK, & JOKER POKER

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

### #3. DUMPIE DEMO DISK

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

### #4. PRINTART DEMO DISK

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

### #5. ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME

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

### #5A. TI MUSIC/GRAPHICS DEMO DISK

A great collection of music and matching graphics. Great examples of music & sprite programming.

### #6. EXBASIC MUSIC DEMO DISK

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

### #7. SPACE SHUTTLE MUSIC/GRAPHICS DEMO DISK

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

### #8. LOTTO DEMO DISK

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

### #9. MONA LISA PRINT OUT DEMO

This disk prints out a near-photo quality picture of that lady with the classic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it!

### #10. GOTHIC PRINT DEMO DISK

This disk lets you type out a phrase on the screen and then print it out in gothic (old english) style. Looks like hand lettered calligraphy. Use for Invitations, announcements and business cards.

### #11. ANIMATED CHRISTMAS CARD

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

### #12. TI-99 OLOPIY DISK

This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

### #13. STRIP POKER (PG RATED)

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

### #14. FIGURE STUDY DEMO (PG RATED)

A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

### #15. STAR/EPSON PRINTER DEMO

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

### #16. SIDEWAYS PRINTOUT DEMO DISK

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

### #17. TI FORTH DEMO DISK

This demo disk was released by TI to show the power of forth. Fantastic music and graphics. Ed/Assem & 32K required!

### #18. TI DIAGNOSTIC DISK

This program loads into the Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

### #19. TI WRITER/MULTIPLAN UPGRADE DISK

This disk released by TI adds real lower case to your TI Writer, speed to your Multiplan and other enhancements. Easy to use. Just substitute new files for old! Instructions included.

### #20. ACCOUNTS RECEIVABLE DEMO

This self contained prize winning program loads and runs in Exbasic and has all the features found in a professional accounting system. Complete with documentation and a second disk side with report generating programs.

## SERIES II

### #21. DATA BASE DEMO DISK

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

### #22. ASTROLOGY DEMO DISK

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

### #23. WILL WRITER DEMO DISK

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 handbook 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 application

### #25. MEDICAL ALERT DEMO DISK

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 DEMO DISK

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

### #27. KIDS LEARNING DEMO DISK

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 DEMO DISK

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## SERIES III

### #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 every thing 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 DEMO DISK

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

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 DEMO DISK

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 programs.

### #37. LAPD COOKBOOK DEMO DISK

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 recipes 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 in this series.

### #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 DEMO

This disk contains the famous game 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 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 autoloading...

### #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. For one program you can access word processing, editor assembler, tele-communications, and just about everything else. A freeware program complete with documentation on a second disk side.

## SERIES IV

### #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 with exbasic loading and an all new menu selection program by Ray Kazner.

### #45. BEST OF BRITAIN, VOL. II.

This disk contains the best 3-D adventure game ever written for the TI-99/4A. The Legend of 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!

### #46. SUPER TRIVIA 99

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

### #47. INFOCOM RAPID LOADER

If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.



## TI PROGRAMS FROM AROUND THE WORLD

### #48. GHOSTMAN (from England)

This Pacman/Hunchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

### #49. DEMON DESTROYER (from France)

This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

### #50. OH HUMNY (from Germany)

Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

### #51. BERLIN WALL (from Canada)

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

### #52. ANIMATION 99 (from Germany)

THIS IS THE ONE!. A demo disk filled with fantastic computer animation routines like you have never seen before. See famous cartoon figures move with more realism than on Sat. morning tv. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

### #53. HACKER/CRACKER

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

### #54. ASTROLOGY DEMO

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

### #55. SCREEN DUMP

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

### #56. SPREAD SHEET DEMO

OK its not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

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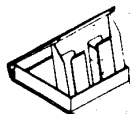
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## Super Sketch meets TI-Artist and Radio Shack

# Adding a mouse to your TI

By JON HODGES

In V2.01 of TI-Artist, Chris Faherty added the capability of using a mouse, or so I thought. It seemed to indicate that any input device properly interfaced could be used, and on the Artist Extras disk was a file called "Mouse," along with a one sentence description: "A DSR to control the TRS-80 mouse from the Super Sketch module. Look at the picture INTRFACE for pinouts of the Super Sketch cable."

Well, I had a Super Sketch, which I was dissatisfied with because it was unwieldy and took up too much space. When Radio Shack put its Color Mouse on sale for \$30, I was ready to make the jump to mouse control. As I was not prepared for what lay ahead, I thought if others try this, they are in for a BIG SHOCK! The obstacles were as follows:

1. Radio Shack has not one mouse, but three. Which one to use? The INTRFACE diagram indicated 6-pin DIN connectors, and the Color Mouse (Cat. #26-3025) and the Deluxe Color Mouse (Cat. #26-3125) both used one. The main difference between them is that there are two buttons on the Deluxe version. As the Deluxe version was "New for '88," I had to assume that the one to use was the single-button unit. Besides, the deluxe version wasn't on sale.

2. I cut the Super Sketch cable and added a DIN plug and jack set so I could switch back to the sketch pad if needed. Then the big moment came when I connected the mouse to the new DIN plug on the Sketch module and I loaded the MOUSE DSR. The screen went yellow and the menu got messed up (obviously a programming error), but I was still able to select TI-Artist, which I did. The pointer sat in the middle of the screen as I moved the mouse around. Nothing! Apparently the MOUSE DSR is incorrect. Others tried their copies with the same result. After the DSR is loaded and TI-Artist is entered, you can still move your cursor with the arrow keys, an indication that the mouse DSR never overwrote the joystick DSR.

3. We loaded the SKETCH DSR and the mouse moved the cursor around, but strange things happened. It selected every function it crossed over, as if I was holding

the Enter key down. Other problems indicated that something was very wrong.

I decided to dissect both pieces of equipment to find out what made them tick. In the companion article is my rendition of the schematic for the switches (see figures 1 and 2).

My explanation for what was happening involves the way the buttons work. On the Sketch Pad, when each switch was closed a voltage of a specific level went back the brown wire and was converted by an A-D chip to mean a specific button was pressed. Note that the lowest voltage produced by a button was 0.9 Volts, and an open (no buttons pressed) was indicated by 0.0V due to the 10K pull-down resistor.

On the Mouse, an open gave that line 0.3V, and closing the switch produced a short to ground. The Sketch Mate cartridge interpreted that 0.3V as somewhere between being open and "lift," the same as pressing Enter all the time. Pressing the button would be interpreted as an open (no buttons pressed) by the cartridge, and once released the signal would float back to 0.3V, causing havoc again.

As using the MOUSE DSR was not an option, the next step was to modify the mouse to look like the sketch pad so I could use the SKETCH DSR. I decided I wanted two buttons on my mouse, one for Enter and one for the Space bar. The Super Sketch "lift" and "menu" buttons produced the same effect, so I designed a pair of switches similar to the Sketch Pad setup. Should you decide you want to use the mouse in the Super Sketch program, you will want to add a third switch to your design for the "select" function.

The design I came up with uses two momentary pushbutton switches from Radio Shack (Cat. #275-1566) that are rectangular and mount end to end over the mouse's single button. A third switch could be added if they are put side by side. I had to remove the three hollow columns under the mouse's button to mount the switches. As far as I can tell, only the center column was used to press on the built-in switch. The other two serve no purpose. Also, so everything would fit I removed the mouse's switch from the cir-

cuit board.

4. After re-assembling the mouse, I loaded TI-Artist using the SKETCH DSR, and the mouse worked perfectly. That is, until I tried to toggle some modes — Invert, Zoom and Mirror. As hard as I tried, I could not get a mode to toggle on without toggling off again consistently. Sometimes it would even go back on again (ON-OFF-ON). No fun. The same thing happened when I was defining lengths and areas (like with Line or Box). Often a point was all I got when trying to start my line (ON-OFF), and many a new line/box got started when I was finishing one (OFF-ON). This certainly would not do. [ My first thought was that these cheap switches were bouncing, and what I needed were bounceless (positive contact) switches. Those are the kind that pop or click when you press them (not to be confused with on/off switches). As I was already thinking in terms of publishing these instructions, I had to find a widely-available, dependable source. If you can find one, let me know. Apparently bounceless switches are not a consumer item.] 5. I did find some bounceless switches, which I put on a breadboard (highly recommended for designing circuits). Loading up TI-Artist, I discovered that the toggling still took place. Bouncing switches were not the problem. [ I pulled out the sketchpad and plugged it in (see, there really IS a good reason to put connectors on both ends of that cable I cut). The Super Sketch had the same problem, I just never used it seriously enough to notice. Surely the answer is in the width of the pulse, right? If I can make it thin enough, there won't be any double or triple triggering. To do that, I needed a circuit that could do the following:

A. Ignore the input for a set period after the initial trigger to eliminate user-introduced toggles. [ B. Output a single pulse of variable width so I could experiment to find the perfect size required. [

C. Output a signal at the supply rail (the same as a dead short to the supply voltage), because the "lift" switch did just that. [

D. Consist of no more than two chips. [

I spent three days re-learning the basics

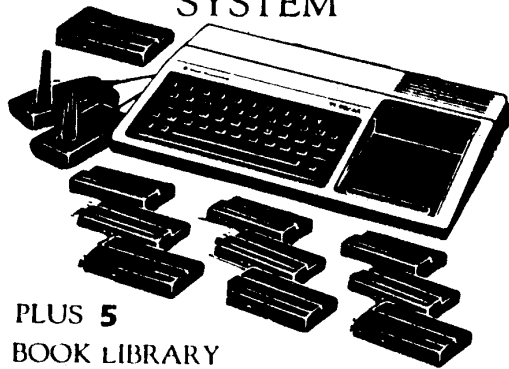
(See Page 24)

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## MOUSE—

(Continued from Page 22)

of logic design the hard way, until I had the perfect circuit that met my needs, and in a single chip, no less! Hint: just because you can spell "electronics engineer" does not mean you are one.

6. With my "perfect circuit" ready, I fired up TI-Artist and tested different pulse widths. Even with a pulse as narrow as 10ms, I got some multiple triggers. With a 1ms pulse I got no more multiple triggers. However, by that time most of my button-pressing failed to trigger anything at all. Something was keeping the pulse from being "seen" longer than the pulse could trigger twice. I believed that would be the keyboard.

See, we have this nice, wire-matrix type keyboard that requires the computer to scan the lines one at a time, looking for a keypress, and that takes time (PCs, etc. have an encoding keyboard that tells the

computer, "the 'P' key just got pressed"). So, while the program is scanning the keyboard for a keypress, most of my "perfect width" pulses got missed. When they were wide enough to be seen every time, many got "seen" two or three times. Using the mouse only by itself was not going to work.

Ah, well, this is what happens when you try to use something in a way it was not designed to be used. In this case, the Super Sketch cartridge was designed to be accessed constantly, not periodically. I noticed that the keyboard being scanned has its advantages. There are no bouncing contacts, pulse widths or extra triggers to worry about when it is used to input commands. That means I can have a two-handed operation going on here. For quick, accurate pointing, I use the mouse. For non-sensitive operations, I can use the buttons on my mouse. But for selecting com-

mands, toggling modes, and defining lines and areas, I use the keyboard with my other hand. This may take some getting used to, but believe me, it is the best of both worlds. Once proficient, this is fast and accurate.

My total cost including the mouse, connectors, and switches, was less than \$40. If you do not see a need for mouse buttons, you will still need to modify the mouse but will not have to shell out for the switches. The \$50 Deluxe Color Mouse is usable also, with only minor modifications needed. If white is more to your liking and you do not care for homemade switches, you could modify a Deluxe model using the general gist of the following instructions.

*Hodges is a member of the Dallas TI Home Computer Group*

# Modifying TI-Artist and the mouse

By JON HODGES

Before doing any modifications, check your Super Sketch unit for proper operation in TI-Artist (with Version 2.01 you will not be able to move out of the top left corner when in the Enhancement mode. See sidebar for the fix). Assemble the following parts, all available from your local Radio Shack:

Cat. No.	Description
Cat. #26-3025	Color Mouse
Cat. #275-1566	Switch (two or three)
Cat. #274-020	DIN plug
Cat. #274-021	DIN jack
Cat. #271-1335	10K resistors (pkg. of 5)
Cat. #271-031	5.6K resistors (pkg. of 2), optional

Cut the Super Sketch cable about 8 inches from the cartridge, mount DIN plug and jack following the diagram INTERFACE that can be found on the Artist Extras disk (which you ought to have for the SKETCH DSR anyway). Re-assemble and test using the sketch pad. Correct any problems before continuing.

Open the mouse, remove the circuit board screws and remove the switch from the circuit board. You will need the space later. If you decided you have no need for

buttons on the mouse, your job is done; re-assemble the unit.

Decide on whether you ever intend to use the mouse in the Super Sketch program built into the cartridge. If so, you will need to mount three switches instead of the two used for TI-Artist.

Remove the mouse button and cut out the hollow pillars on the inside. Be careful not to damage the solid pillar or lose the spring that came on the end of it. That pillar is used to position the button and will be needed later. Measure, mark and drill 3/8 inch holes for the switches. MOUNT THE SWITCHES NOW. You will find that if you carve a little bit of plastic out of the sides of the button where the nut screws on, it will seat completely.

If you are mounting three switches, you MUST mount the switches with the button already mounted in the mouse's lid.

Only now can you begin to wire up the switches. I used 30 gauge "wire-wrap" wire (Cat. #278-501-2-3) which is thin and flexible enough to have 5-8 inches between the switches and the circuit board for easy assembly. Following the diagram, solder the resistors in place. If you do not have a 5.6K resistor, two 10K resistors in parallel will work just as well. You can

also substitute a 10K for the 12K resistor if you are going to add three switches.

You will find that if you bend the solder tabs on the switches by 90 degrees, the fit will be better and there will be less chance of a short circuit occurring. The 10K pull-down resistor that goes between signal and ground can be tack-soldered to the bottom surface of the circuit board where the switch used to be. Do not pass the leads through, as they will cause problems.

Place electrical tape over the circuit board where the switches will touch it, and carefully re-assemble the mouse. If you don't trust your handiwork and have access to a multimeter, take resistance readings between pins 4 and 5 in the DIN connector. The meter should read very high until you press a switch, and then it should read 0 ohms for switch 1, and 5K ohms for switch 2. If you have a third switch, it should read 12K-15K ohms.

Attach your mouse to the Sketch Master module, and try out TI-Artist using the SKETCH DSR. If funny things happen, like the ability to move one way but not another, you probably wired up the DIN connectors backwards.

With the proper flat surface (read the (See Page 25)

# MOUSE—

(Continued from Page 24)

mouse's manual), a mouse can be used with great precision and joy. Therefore, the only thing left to do is clear a space on that cluttered desk and get down to using your mouse!

## Of mice and men Version 2.01 and Super Sketch

By JON HODGES

Chris Faherty had a good program when he first released TI-Artist. He made it better with many major additions and modifications for Version 2.0. Then he made it portable in Version 2.01, so you could store your TI-Artist on a RAMdisk, and quickly move between the Artist and enhancement command screens.

However, in converting the programs, he had to do the analog device support portion "blind" as he no longer had access to a Super Sketch unit to check his handiwork. (This is one of the hazards of writing a program that supports a wide range of devices — you have to keep them on hand to test each release.) The inevitable happened. Part of the code that multiplies the pointer position got left out of the Enhancement program, leaving the user with a pointer that could not get out of the top left corner. After bringing this to his attention, Chris worked up a fix for us. Thanks for the personal attention, Chris!

The fix is in ENHPT2. Get your original Vn. 2.01 disk out and make a backup copy. Now put away your original and modify the backup.

Using a sector editor, advance to sector DD. Starting at location 9A is the string 04E0 B828 0460 D2CA 0000 0000. Change it to read 04E0 B828 04E0 B804 0460 D2CA. Write that back to the diskette, and load TI-Artist. Load the Sketch DSR, then ENHANCEMENT. You should be able to move the pointer all around the screen. If not, go back to your sector editor and insure that you edited sector DD correctly. Once proper operation is verified, you can copy ENHPT2 to your working disk or RAMdisk.

You may be wondering why the Radio

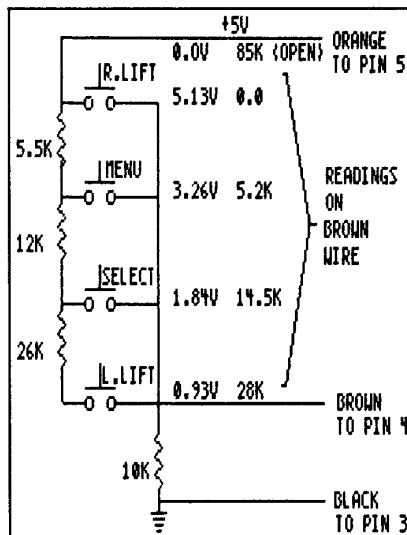


FIGURE 1 SKETCH PAD SWITCH LAYOUT

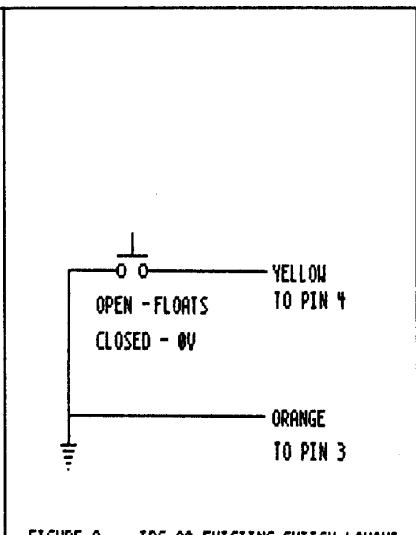


FIGURE 2 TRS-80 EXISTING SWITCH LAYOUT

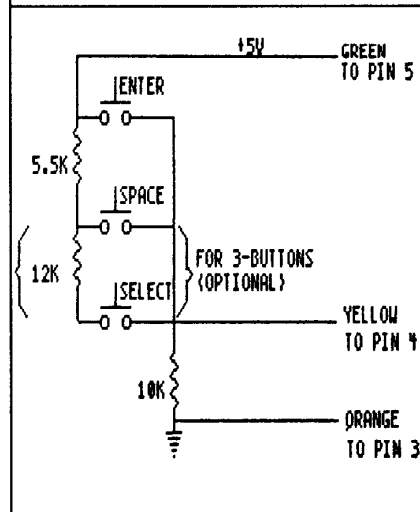


FIGURE 3 TRS-80 MODIFIED SWITCH LAYOUT

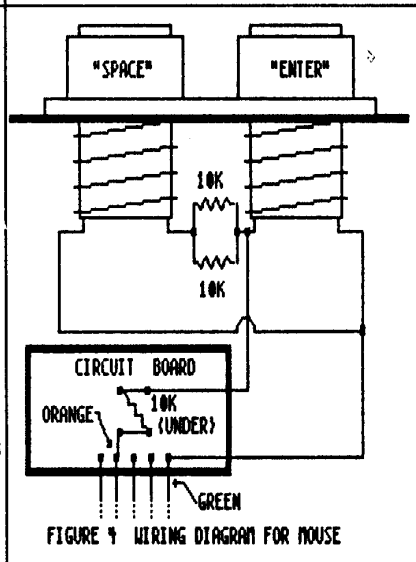


FIGURE 4 WIRING DIAGRAM FOR MOUSE

Shack Color mouse is specified for this project, and not one of the many other readily available mice on the market. It has to do with the way the mouse and the program work together to define the pointer's position. The Radio Shack mouse is an analog device, just like the Super Sketch. Using a variable resistor for each direction, it divides a supplied voltage and returns it to the cartridge where an Analog-to-Digital converter matches that voltage to a position table. The result is that the program gets a pair of values that indicate an absolute position for the pointer.

Other mice work differently. Common-

ly known as "serial" mice, they provide only a relative position. Their output could be described as "I moved thus far in this direction," allowing the program to specify the starting position. (Sound familiar? This is how our joysticks work.) Relative positioning also lends itself nicely to changing the ratio of pointer movement to mouse movement.

Besides the obvious advantage of being able to specify "quick" or "precise" movement, different resolution screens need their own multipliers to move from point to point. Unfortunately, the serial (See Page 38)

# TI still cares

## *But not about producing another home computer*

By LAURA BURNS

Texas Instruments is not planning to make another computer compatible with the 99/4A and is not stopping service to the 4A. Jeffrey Crump, supervisor of TI's technical assistance group in Lubbock told attendees at the first Texas TI Faire in Richardson.

He made the statement to quell rumors he said he had been asked about on the floor of the fair "about 10 times." He said TI has no plans to get back into the 4A market.

TI is working on advanced calculators and on voice recognition products for education, he said.

Crump noted that the primary service is replacement rather than repair.

"We do not repair many products," he said.

For repair or replacement, he said, users should call Dealer Parts at (806) 741-2265. They have lists of prices for parts, schematics and technical data manuals.

Currently, for consumer relations and technical, customers can call 1-800-TI-CARES. He says this number is eventually going to be disconnected for economic

reasons. Toll number for consumer relations is (806) 747-1882, and for technical assistance is (806) 741-2663.

He says consumer relations receives 30,000 to 50,000 calls per month, and 40 to 50 percent are technical assistance calls for the 4A.

He notes that technical assistance provided is mainly software oriented. Also, Crump notes, the company no longer provides help with the Editor/Assembler, as the group member who provided the service left the company and there were only three or four calls on E/A per month, too few for it to be practicable for someone else to learn a new language.

He notes that the written communications group at TI received 180,000 letters last year. This group can provide general information on sales and repair or can refer questions to the technical assistance group.

When writing TI it is important to provide complete information and a daytime phone number, he said.

A vendor in the audience said the toll-free number is a good selling point for current TI products and expressed disappoint-

ment at the future discontinuance of the number.

It was also noted that computer components without any specifically "TI content" such as monitors, printers or disk drives could possibly be repaired more economically locally — a monitor at a TV repair shop, a printer or disk drive at a computer repair center.

Asked about products such as the GRAM Kracker, which will dump a cartridge to a disk, Crump called it piracy.

He said he had noticed pirated software on the floor of the fair.

He said he felt the reason TI did not prosecute is probably that TI "is not being hurt. They're not in that business. It's the retailers in the TI market, like your vendors at this fair, who are being hurt."

He said duplicating software is a termination offense at TI.

"We don't even duplicate our own software," he said. "If I'm working with TI-Writer and something goes wrong with it, I don't make a copy of TI-Writer, I go and get another TI-Writer package."

## Forti card demonstrated, still attainable

A limited number of the FORTI music synthesizer cards developed in 1984 are still available and specifications have been published whereby users can make their own.

Sam Weller of the Forest Lane Users Group demonstrated the card at the Texas TI Faire April 30 in Richardson, Texas.

Used with "surround sound" quadriphonic stereo, 12 sounds plus four tones in total are available with the card, which runs out of the Editor/Assembler.

The card will also enhance the sound of music disks from user group libraries, although they will not have the true quadriphonic sound of music produced on the FORTI software, Weller noted.

He demonstrated use of the card to enhance the sound of Parsec, and noted that the console speaker can be used with the speech synthesizer to add speech. The console speaker is turned off for music only,

he said.

A limited number of FORTI kits are available from Bob Lawson, 1344 Boston Ave., Bayshore, NY 11706.

Steve Tuorto of Bayshore, who says he

promotes the kits for Lawson, says the kits sell for \$65 plus \$5 for shipping.

Tuorto says Lawson also has specialized parts for persons wishing to build the cards (See Page 29)



One of the programs at the TI Faire in Richardson was a telecommunications forum. From left are Blaine Crandall of The Source TI-SIG, Jim Horn of the CompuServe TI Forum and Scott Darling of GENie's TI Roundtable. Not pictured is Richard Fleetwood of TI NET on Delphi.

Photo by Bruce Burns

Geneve

# Accessing the sound chip

By MIKE DODD

One reader asked "How is the sound chip (SN 76496) interfaced to the 9640?"

The sound chip used on the Geneve is the same chip that TI used in the 99/4A computer. From the Geneve's GPL mode, you would access the sound chip the same way you would on the 99/4A. For a discussion of this (albeit somewhat difficult to understand), read the Editor Assembler manual, chapter 20. Mack McCormick also did a tutorial on using the sound chip in the February 1986 issue of MICROpendium.

From MDOS mode on the Geneve, the sound chip is accessed either by directly writing to the sound control byte at >F020 (the equivalent byte in GPL mode is at >8400), or by using an XOP call. The relevant calls are in the Video Library, op-codes >2D and >2E. See Paul Charlton's XOP manual for more information.

Another question had to do with 16K

ROM cartridges in GPL mode. The cartridge space is from >6000->7FFF, which is only 8K. However, the 99/4A, and, of course, the Geneve, has a bank switching scheme - any write to >6000 (or >6004, >6008 ... >7FFC) would page in bank 1, and any write to >6002 (or >6006, >600A ... >7FFE) would page in bank 2.

This method was used on all cartridges with two banks. The most popular two-bank cartridge is Extended BASIC. In addition, many third party cartridges (especially many of the Atarisoft cartridges) used two banks.

On the Geneve, you can tell if a cartridge is 16K or 8K after you load it with the GPL interpreter - if it is 8K, options F1 and F2 (to toggle the protection of >6000 and >7000) will be displayed - if it is a 16K cartridge, those two options will not be displayed, as the cartridge space must be protected for the bank swapping to take

effect.

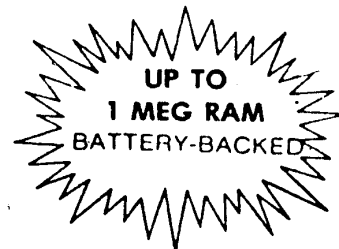
The exception to the two-bank swapping scheme are MBX cartridges - those cartridges utilize many banks that are swapped in a different method. That is why the Geneve cannot run MBX cartridges.

One of the many features of the 9938 VDP chip is the ability to change the colors. In MY-Art, you can change the hue of the 16 available colors to reflect any of 512 possible color combinations. In BASIC (and Extended BASIC), there are 16 colors, numbered 1 to 16. 2 is black, 16 is white, and the others are varying shades of other colors. With the program "Color Selector" (listing to follow), you can change the colors. You can make color 8 be black, or brown, or a certain shade of orange, or any combination. No longer are you restricted to using the 16 preset colors!

The 9938 changes colors by setting each  
(See Page 28)

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# GENEVE—

(Continued from Page 27)

color with certain intensities of Red, Green, and Blue. Each color can have an intensity from 0 to 7. The color black has all three set to 0. White has all three set to 7.

The program operates out of Extended BASIC. From command mode, or from a running program, you can use the command CALL LINK("COLOR",c,r,g,b). C is the color to change (from 1 to 16), r is the red intensity, g is the green intensity, and b is the blue intensity. The colors will not revert back to their defaults until you re-powerup (either by turning the power off and on or by using CTRL-SHIFT-SHIFT then CTRL-ALT-DEL). In other words, you can change the colors, then go run TI-Artist,

GRAPHX, a game program, or anything else you can imagine.

You need to enter the program with MY-Word's Program Edit mode. Assemble it with the "R" option. Load it with CALL IN-IT <ENTER> CALL LOAD("object filename") <ENTER> from XB. Then use the CALL LINK command to access it. Experiment! You can't possibly harm anything, nor can you permanently change anything.

*Readers with questions about the Geneve or problems may write Dodd at 116 Richards Dr., Oliver Springs, TN 37840. Questions may be answered in this column. Personal replies cannot be guaranteed.*

## Color Selector

```
* Color selector
* Copyright 1988 by Mike Dodd
* For MICROpendium magazine
*
* use: CALL LINK("COLOR",C,R,G,B) where:
*   C = color to set (1 - 16)
*   R = red value (0 - 7)
*   G = green value (0 - 7)
*   B = blue value (0 - 7)
*
DEF COLOR
FAC EQU >834A      VDP write port 2 - palette register
VDPW2 EQU >8C04    get number
NUMREF EQU >200C   write to VDP register
VWTR EQU >2030    system link
XMLLNK EQU >2018   error link
ERR EQU >2034     convert floating to integer
CFI EQU >12B8     color (0 - 15) we subtract one
C BYTE >00        for XB offset
R BYTE >00        red value
G BYTE >00        green value
B BYTE >00        blue value
*
H01 BYTE >01      constant
EVEN
*
MYWS BSS >0020    buffer for workspace
*
COLOR LWPI MYWS   load workspace pointers
BL @GETNUM       get number
DATA 1           first number
BYTE 1,16        legal range
DATA C           place to store byte
SB @H01,C        minus one for XB offset
BL @GETNUM
DATA 2,>0007,R   second number, range, store in R
BL @GETNUM
DATA 3,>0007,G   third number, range, store in G
BL @GETNUM
DATA 4,>0007,B   fourth number, range, store in B
* We now have all the values we need to set the color
NOVB @C,R0       get color number
```

```
SRL R0,8         to LSBy
AI R0,>1000      write to VDP R16
BLWP @VWTR       execute the write
NOVB @R,R0       get red value
SLA R0,4         to MSNybble
AB @B,R0         get blue value
NOVB R0,@VDPW2  write to port 2
SWPB R0          delay
NOVB @G,@VDPW2  write green data to port 2
* All done now. Return to Extended BASIC.
LWPI >83E0       GPLWS
B @>6A          return with no errors
*
* Get a number
* Use: BL @GETNUM
*   DATA which variable to get
*   BYTE low legal value, high legal value
*   DATA pointer to where to store byte value
*
GETNUM MOV *R11+,R1  get which variable
CLR R0           not an array
BLWP @NUMREF     get the number
BLWP @XMLLNK     system call
DATA CFI         convert floating to integer
NOVB @FAC,R0     get MSBy
JNE BADVAL      set - then over 255, and illegal.
NOVB @FAC+1,R0  get LSBy
CB R0,*R11+     lower than legal limit?
JL BADVAL       yes
CB R0,*R11+     higher than legal limit?
JH BADVAL       yes
MOV *R11+,R1    get address of where to store value
NOVB R0,*R1     store it
RT              and return
* Return a bad value error message
BADVAL LI R0,>1E00 bad value message
BLWP @ERR       return error
*
END
```

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# Videoflex card on view at faire

Videoflex, a professional video imagery system for the Myarc 9640, was demonstrated on the floor of the Texas TI Faire in Richardson April 30.

The product offers facility for superimposing high resolution computer graphics over an incoming television signal and frame grabbing of multiple images for animation and other purposes. Dave Miller of Miller Communications of Seattle, which is producing Videoflex, says it should be available for retail by early summer at an estimated \$7,000 to \$10,000. This price range is envisioned because of the technical support required for the product.

The unit is housed in a 19-inch rack-mount chassis and has a 250-watt power supply, 80 meg. hard drive and fully configured computer. A 1 meg. RAM disk will handle real-time animation requirement.

Miller says an Image Wise Frame Grabber is being tested with the systems but other systems by Kodak, Sony and Minolta are being evaluated.

The Video Imagery System will be housed in a 19-inch rack-mounted chassis with shielding suitable for a broadcast facility. A 250-watt power supply will accommodate peripherals through a 10-slot bus system which has been designed from scratch. Additional slots in the rear compartment of the chassis will be used for animation RAM. Videoflex is connected by cable to the 9938 Video Display Proces-

sor chip on board the Myarc 9640. The computer is scheduled to come fully configured with 1.5 meg. RAM, 80 meg. hard drive and controller, and 5¼" and 3½" interchangeable disk drives. A video digitizing pad, stylus and optical mouse system interface with the built-in drawing software for animation changes. Special effects and a character generator are activated by pull-down menus which do not interfere with the ongoing production, Miller says. Separate video and computer monitors are not necessary with this function. In 1989 a companion desktop publishing system is scheduled for production, he says.

The 10-slot bus system alone, which can hold the Geneve 9640 plus other cards, is scheduled to retail for approximately \$350. (See January 1988 MICROpendium.) Miller says this price, higher than the \$320 originally estimated, is because the box may be redesigned as the company is finding it difficult to complete them in a timely fashion. Miller notes that he will be selling only Videoflex systems; for the box alone, users should contact the Queen Anne Computer Shoppe, 6102 Roosevelt Way, N.E., Seattle, WA 98114 or (206) 522-6558 or (206) 622-9400 (answering service 8:30 a.m.-5 p.m. M-F).

## Grand RAM shown at Texas TI Faire

Scott Darling, who operates the GENie TI Roundtable, brought a DataBioTics Grand RAM card to the Texas TI Faire in Richardson, Texas, April 30.

He said Bill Moseid of DataBioTics had asked him to bring the card so that users would know "it's not vaporware," despite problems customers have had receiving it, particularly those who ordered from Innovative Programming.

He said the main differences between the card and the Horizon RAMdisk are "the Grand RAM has a print spooler and Horizon doesn't. Also, the Horizon RAMdisk is available and the Grand RAM isn't."

He says there are currently 18 Grand RAMs and that he was unable to get a specific answer from Moseid as to when more

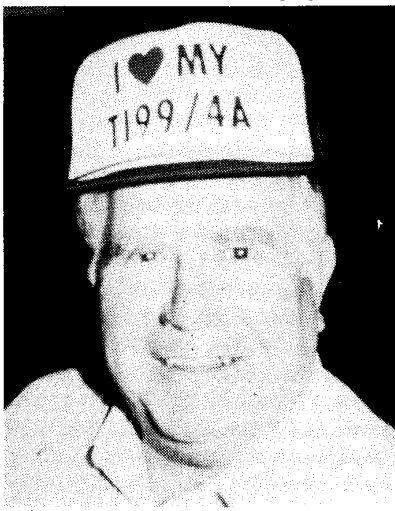
would be shipped. Darling pointed out defects on the card he brought to the Faire, but noted that it still worked, "I don't know why."

Darling said he was unable to answer questions about the card.

## FORTI—

(Continued from Page 26)

from the specifications published in the manual for the PEB Prototyping Board, available from the Computer Bug, 5075 Clairton Blvd., Pittsburgh, PA 15236, (412) 882-3374. Chips for the FORTI card are available from the TI Parts Department, he said. For further information, contact Tuorto at (516) 242-1378.



John Horn displays TI loyalty at the Texas TI Faire in Richardson.

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# Steps to guard against mail fraud

While most companies doing business by mail are reliable and reputable, mistakes can happen in someone's order. Or, there can be cases of outright fraud.

Postmaster Harold Creed of the Round Rock, Texas, Post Office outlined for MICROpendium some steps a consumer can take in order to prevent being victimized.

- When ordering anything by mail, Creed says, keep a copy of the order, showing the date and the address.

- If your order does not arrive within 30 days, write an inquiry letting your seller know that the check has cleared the bank and you have not received the merchandise. Again, Creed says, keep a copy with the date. Give the vendor 10 days to reply.

- If the order is not filled or if there is

no explanation, bring in the copies of your records of the order to your local postmaster. "Records are the big thing," Creed notes. The postmaster will normally make a set of copies to send to the postal inspector in the geographical area you ordered from.

- The inspector will normally tell you to write the vendor again, informing him that you have turned over the matter to postal authorities. It "doesn't hurt" to say you are going to turn the matter over to them in your first inquiry, Creed notes.

Creed says that the postal authorities eventually investigate all complaints, but "it takes so long to build a case on them it's kind of frustrating." If there are a lot of inquiries about a particular company, the investigation will receive a higher

priority, he says.

A good way to check a company before you send in money, he says, would be to inquire with the Better Business Bureau. He says it is a good idea to make a complaint to the BBB at the same time you turn records over to the postal authorities.

If the company is outside the United States, the procedure is "pretty much the same, but it might take longer on your answer," he notes.

If the company does not have the product in hand but cashes your check to use in making it, this is a "gray area—I'm not a lawyer," Creed says. The wording of the advertisement might be relevant, he notes.

The postmaster may not know the answer when a consumer has a mail-order problem, but will work with you, he says.

## Saving connect time (& money) with up and downloads

By WALT HOWE

Copyright 1988 by Walter Howe  
(All rights reserved)

I spent some time on CompuServe one Sunday up and downloading the same file again and again. This may not sound like the most exciting way to spend a day, but it answered a lot of questions, and the results can save money for anyone who uses the information services or pays long distance charges for any up or down loading.

Which is faster — reading a text file directly (and capturing it in a buffer) or downloading the same file in compressed form by XMODEM or CompuServe B protocol? How much faster is CompuServe B than XMODEM? How much difference does the time of day make? Are Fast-Term's XMODEM and TELCO's comparable in speed?

The answers to all these questions are covered in the information that follows.

For my tests, I used a 29 sector ASCII (text) file both in normal form and compressed down to 16 sectors with Archiver II, version 2.4. I chose a file less than 33 sectors so that multiple disk accesses would not become a factor, and, of course, to keep my own time within limits. I ran the

tests using a Geneve 9640, and all up and downloads were to or from the built-in GPL RAMdisk to eliminate differences between physical disk drives as a factor. All tests were run at 1200 baud using a Hayes Smartmodem 1200. I accessed CompuServe through a local CompuServe node. I ran the tests at two different periods of the day on Sunday — about 1 p.m. when things were quiet on CompuServe and about 8 p.m. when things were much busier. I repeated most transfer methods in the same time frame to make sure the results were consistent. At all times, I seemed to have clear lines; transmission errors were never apparent.

I transferred the uncompressed file as a binary file by using TELCO's XMODEM, Fast-Term Geneve's XMODEM, and the CompuServe B protocol from a beta test version of TELCO 2.0. For ASCII transfers, I used TELCO's ASCII feeding CompuServe's DC2/DC4 protocol for upload, and downloaded the file by reading it while logging to a buffer. I transferred the compressed file for comparison purposes using TELCO XMODEM and CompuServe B.

Here are the results of the evening tests in minutes and seconds. In most cases,

these times are averages of several trials, but very slow transfers at busiest times were not included. Early afternoon light period times were generally about 10-12 percent faster than those listed.

Transmission Mode	Up	Down
<i>Uncompressed binary</i>		
TELCO XMODEM	2:15	2:24
Fast-Term XMODEM	2:15	1:57
CompuServe B	1:33	1:43
Text file	1:08	0:54
<i>Compressed binary</i>		
TELCO XMODEM	1:38	1:22
CompuServe B	0:45	0:57

I was surprised to see that some methods took longer to download than upload and others took less to download. These increases or decreases were obtained consistently when rechecked at different times, although the actual times varied quite a bit depending on how busy CompuServe seemed to be at the time. At one slow period, a TELCO XMODEM upload took as long as 2:43 and the download an even 3 minutes.

It is clear that CompuServe B is the fastest way to upload a file, whether com-  
(See Page 32)

PLUS! Version 1.0

# For word processing and more

By DICK ALTMAN

I am one of the many who feel Tony McGovern did more for word processing on our 99/4As than anyone, including Texas Instruments.

Shortly after the first version of Tony's program FUNLWEB appeared, a school teacher in East Douglas, Massachusetts, put together a companion piece he called FUNLPLUS that contained many enhancements that gave you good control of your printer while writing letters, articles, stories, or any of the many other things you do with a word processor.

FUNLPLUS was designed for use with any word processor programs, but especially for FUNNELWEB (called FUNNELWRITER, at that time).

During the last half of 1987 and the first few months of 1988, Sughrue set out not only to improve his FUNLPLUS but to create a powerful word-processing companion/utilities disk. He had received so many questions and suggestions from users he felt there was a real need for such an extended companion. But Sughrue is the first to tell you he owes a great deal to such people as Tony McGovern, Jim Peterson, Charles Good, Chris Bobbitt, and many other names you have seen in MICROpendium and on bulletin boards.

His new disk — PLUS! (with an exclamation mark) — is much better and bigger than his earlier word-processing companion. Although the majority of the 70 or so files are completely new, the 21 that came with 1986's FUNLPLUS have been updated and improved and are included in this complete package.

PLUS! requires two ss/sd disks, or a floppy to contain all of the documentation and extra goodies. The DOCS take up almost 400 sectors! This version was released at the N.E. T.I.FAIRE (FAYUH) in Lexington (where Paul Revere rode 213 years ago) on April 9 of this year through his user group (M.U.N.C.H. of Worcester, Massachusetts).

Sughrue's main intention is to give you everything at one time, then you can pick and choose those portions that appeal to you and custom design your own special word processing disk that will include such

## Review

### Report Card

Performance .....	A
Ease of Use .....	A
Documentation .....	A+
Value .....	A+
Final Grade .....	A

### Cost \$10

**Manufacturer: Jack Sughrue, Box 459, East Douglas, MA 01516**

**Requirements: disk system, Extended BASIC, memory expansion, printer for most files (DSSD will be shipped unless SSSD is specified)**

things as your favorite word-processing program, probably one of the turbo copiers, a terminal emulator, perhaps a word counting program, etc. For instance, the latest few versions of the famous FUNNELWEB already contain the fabulous DM 1000, DISKO, etc., but when you remove the documentation, you still have a lot of room on a DS/DD disk (even more room if you have a RAM disk) for other "most used" programs so that one disk will contain 90 percent, or more, of your utility programs used every day.

PLUS! just adds so many controls and templates with one keystroke that can automatically set up your margins, tabs, letter forms, page numbering, type font selection, and all those other time-consuming little things that you will wonder how you ever got along without it. You read that correctly: ALL of the above items can be set up at the same instant with just one keystroke! And most of these powerful templates are only two or three sectors long!

It's almost impossible to categorize this collection of unusual yet cohesive programs. Are they a companion? Environment? Utilities? Files? In PLUS! we finally have a program that makes great usage of and standardizes the Transliteration commands that the cumbersome TI-Writer manual devoted only one paragraph to. He also teaches you, with PLUS!, how to design anything and assign it to any key on

your keyboard to be called up via the CTRL key and the one you assigned it to. Now you can have such things available as the symbols for diamonds, clubs, hearts, and spades if your correspondence calls for it, or perhaps you want to make special borders or letterheads, or design your own calling card, or whatever.

If you write a lot of term papers or for publications, all of your special headings, margins, spacing, page numbering, footnotes, etc. can be designed so that you can set it all up with one simple digit when you first enter the EDIT mode of your word processor. You merely type in, in the command line, LF and press Enter, then DSK1.1 and Enter again. You can have several formats that can each be called up with a simple 1, 2, or 3, or whatever. If you wish to use one format for letters to Aunt Millie, and a different one for complaining to your electric power company, you can set up either with just one number.

You can highlight one word or a sentence by placing it in italics (if your printer is capable), or emphasize or doublestrike, or underscore that one word or sentence, or even print it in a different size of type. Even subscript or superscript can be invoked with the CTRL key and one other.

If you write articles for a newsletter, Sughrue has even included a multicolumn program that will set your article up in as many columns as you require, just to eliminate that old bugaboo cut and paste! There have been many multicolumn public domain programs written and Sughrue has culled from the best and modified the result to include here.

If your thing is banners, the program includes one of the better banner-making programs. He has also slipped in a little program so you can quickly print up just one label or a whole mailing list and another that will print out any DV/80 file instantly without loading your word processor. PLUS! also contains a short file to create your own guide strip that fits on the slot above your keyboard (one for FUNNELWEB and DM1000 is included).

Sughrue has provided a fabulous public domain program for printing in  
(See Page 32)

## SAVING TIME AND MONEY—

(Continued from Page 30)

pressed or uncompressed. It is also the fastest way to download a binary file, but it is a tossup between reading a text file and downloading it in compressed form. The compressed download seems a trace slower, and the convenience of being able to read it directly will probably make direct ASCII transfers the choice of most people, except where upload time is costing money as will occur when a packet net is in use or the call is long distance.

Where CompuServe B is not available, such as with other information services or BBS calls, binary uploads make little difference, but Fast-Term consistently beats

TELCO in download time. Others have observed this, too. Text file transfers are clearly faster than binary file transfers where CompuServe B is not available, even if the binary files are compressed.

You can definitely save money by downloading at quiet times of day, such as the early hours of the morning or weekend mornings in general. In particular, if the network or the node is so busy that text appears to scroll unevenly on screen at 1200 baud or menus are slow to respond, it is a poor time to download. Up and download times were significantly slower under those conditions.

These tests are not the last word on the

subject by any means. Although I was careful to keep conditions as consistent as I could and repeated most tests, there is some chance of error in the results still due to the highly variable conditions. To be confident of results, I should repeat them at 3 a.m. sometime, but I am in no hurry to do that. I have not tried to repeat the tests on other networks to see how consistently they apply elsewhere, and that should be done at some point, too. And finally, this describes conditions as they existed on CompuServe on April 23, 1988. Improvements in network and 99/4A and Geneve software can be expected in time that are likely to change these results.

## PLUS!—

(Continued from Page 31)

Gothic lettering (upper and lower case) for making neat looking award certificates. He has a little two-sector program to instantly dump your work from the screen to your printer. He has provided you with calendar-making programs you can use to make your own monthly or yearly calendars with your notations applied directly onto the dates of your choice, as well as the headings. There is a handy, compressed (to disk envelope size) 3-column cataloger that includes your name and the date along with all the standard catalog information. He has a little program that allows you to print, with condensed subscript and tightened linefeed, onto adding machine tapes! Imagine a novel on 2-inch wide tape! Or what kind of comments would your correspondence on tape bring forth?

Did you ever want a program to transfer your normally-written words into Pig-Latin? PLUS! contains such a program. Most of these tiny programs were written by Sughrue (who seems to have a compulsion to write tiny programs). The word-processor he includes is only one line long! Some of the other programs are modified versions of PD programs or programs reprinted with permission of the authors. Sughrue has given credit to all to the best of his ability.

Other interesting PLUS! programs include a program (SMALLIFY) that shrinks XB programs in much the same way that SMASH does, a presentation program

(PLUS!VIEW) that can be adapted to any workshop or presentation, a TLTESTER to test your own or his printer codes, a flowchart by Charles Good to follow the new FUNNELWEB's unusual CONFIG program, and the PD MAX-RLE which lets you print out pictures from almost any source and convert them: the best graphic interpreter around with a Mickey Mouse character to test it with.

Sughrue even sends along a guide sheet with his disk that shows how to make graphics for the TL key, among other things, and lists the files, 12 of which are packed into four 'DOCPACKS,' as he calls them. The documentation printout actually creates a manual.

It would be difficult to figure what such a disk full (719 sectors) of such programs would cost for another computer or even for our TI if this weren't Fairware.

Now for what's wrong with PLUS! Not much, really, other than there may be too much to comprehend at one time. Unfortunately, regardless of the "compatibilities" advertised by printer manufacturers, not all printers are compatible. Sughrue's printer is an Epson-compatible Gemini 10X, so all of his controls and templates are for that printer. My own is an Epson-compatible Panasonic 1091i, and a few of his commands just don't do the same things on mine. It took a little close reading of my printer manual to reach 98 percent usage of PLUS! But five of the files, as explained in "GEMDOCS," are specifically for Star

printers. For instance, Sughrue uses a "goose-head" for a pointer. His one-key command to call up the goose-head produces something on my printer that looks a little like a turkey going in the opposite direction. Some of his fancy borders I just am not capable of reproducing, but I have found other unique little designs that I didn't know my printer was capable of. I would love to have used several of them in this article, but I was afraid of what they would look like after MICROpendium set this article up in its final form. I promise you that any letter you get from me will have some of them in it.

My recommendation: If you have a printer, PLUS! will provide a whole lot of exciting word-processing and graphics tools and tutorials for the small Fairware price of \$10. An excellent buy!

## GENie adds Medical RoundTable

GENie Information Services has added the Medical RoundTable, a forum for information exchange among physicians, other health professionals and the public.

The Medical RoundTable, developed and maintained by Dr. Michael P. Weinstein of Fort Valley, Georgia, offers 13 data libraries including two devoted to AIDS information.

Weinstein is a pediatrician, medical columnist and author of medical software.

# Newsbytes

## Database coming from Textaments

Textaments will soon be unveiling a new database program for the TI99/4A according to Steven Lamberti, company president.

Lamberti says the program, TI BASE, has been under development for the past year. He says that it many ways it resembles dBASE II from Ashton-Tate, the most popular database for the IBM PC/XT/AT and compatibles.

Unlike other databases for the 99/4A, TI BASE contains a database "engine" which uses a procedural command language to create, access, manipulate, display and print database information, Lamberti said. It is also relational in nature; that is, five database files can be activated at once.

He estimates shipment by the end of the second quarter of 1988.

For further information, contact Textaments, 53 Center St., Patchogue, NY 11772, (516) 475-6463 (BBS) or 475-3480 (voice).

## RAMER BBS to close

David Sontos has announced he will shut down the RAMER 99 BBS in Succasunna, New Jersey, as of July 1.

He says the number of TI users on the 2½-year-old board has dwindled and he cannot support the majority of the current users who own other brands of computers.

"Let me say a special thank you to the people who gave me help and support," he says.

Until July 1, the board operates at 300/1200 baud at (201) 584-5373.

## Chicago gearing up for 1988 TI-Faire

The 1988 Chicago TI-Faire will be held Nov. 12 at the Holiday Inn in Rolling Meadows, Illinois.

The Faire is sponsored by the Chicago-Area TI99/4A Users Group.

A social mixer is planned for the evening of Nov. 11 with an admission charge of \$4, and a dinner will be held after the Faire Nov. 12, with a charge of \$10 per person.

Exhibit space is \$75 per 8-foot table, according to Marcy Brun, Faire manager.

Tables are limited and will be reserved in the order requested, Brun said. A limited number of basic TI99/4A systems will be provided to vendors for a \$15 apiece rental fee on a first-come, first served basis, Brun said, noting that vendors should also indicate if they need other equipment which cannot be transported.

For further information, contact Brun at 310 Park, Elgin, IL 60120 or (312) 695-9291.

The Chicago TI-Faire is held in conjunction with the Milwaukee TI-Faire, which will be at the Quality Inn in Milwaukee, Wisconsin, Nov. 13. For further information, contact Gene Hitz, Milwaukee Area 99/4A Users Group, 4122 N. Glenway, Milwaukee, WI 53222 or (414) 535-0133; or the Wisconsin 99er Computer Council, P.O. Box 2723, Appleton, WI 54911.

## Group changes name, BBS number

The Brandon TI Users Group in Florida has changed its name to the Greater Tampa Bay Users group. Thomas Austin, the group's president, says members voted for the change to reflect the scope of the group, which as members from all over the bay area, some coming from as far away as 40 miles.

Members also elected Gary Sweers as sysop and the group's BBS was moved to his house. New phone number for the board is (813) 654-TITI (8484).

## Gramulator set for May shipment

Shipping was scheduled to begin in May for the Gramulator, a device which can dump the contents of a software cartridge to a disk.

The Gramulator sells for \$180. For further information, or to order, contact CaDD Electronics, 52 Audubon Rd., Haverhill, MA 01830 or (617) 372-0336.

## Sorry, wrong number

Ken Hamai listed the wrong number for the 99BBS in his review of Super Space II in the April issue. The correct phone number is (213) 947-7777.

## EB Software releases TI-Runner Level Editor

EB Software has announced its new product, TI-Runner Level Editor, scheduled to be shipped May 15.

According to Jon Burt, president of EB Software, the product allows the user to create, edit and manage TI-Runner screens.

TI-Runner Level Editor sells for \$19.95 and requires Extended BASIC, one disk drive and 32K memory expansion.

For further information write EB Software, 905 West Middlefield Rd. #953, Mountain View, CA 94043.

## Boards running in California

MICROpendium has been notified of two BBSes in California, the Knights Castle and River City TIBBS.

The Knight's Castle operates 24 hours at 300 and 1200 baud at (916) 929-0692 (8, N, 1). It is running Clinic 2.5 (modified Techie) software. It features online games, a library room and four message bases. It uses TI99/4A and Xmodem for file transfers. All computers are welcome, according to sysop David Knight.

The River City TIBBS operates 24 hours at 300 and 1200 baud at (916) 338-1571, using the TI99/4A for Xmodem file transfers. John Riley is sysop.

## Business program for the 9640

A company called Bryght Data, RD #1, Box 81, Towanda, PA 18848, is planning to introduce the Fulgent 9640 Business System.

According to the company, it is the most advanced, automated accounting system ever developed for the TI community. The system has been developed to run on the Myarc 9640 computer system and offers unprecedented performance for the small-to medium-sized business or professional corporation. Here are some of its features:

- Multi-Tasking;
- Optional password protection at 25+ levels of each module;
- Auto-installation of the entire system;

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# User Notes

## A modest proposal

This is from John Johnson, via the GENie telecommunications network. He posted on the TI99/4A roundtable. It's a proposal to standardize one aspect of programming for the 9640.

I have an idea that I think should be adopted by people that program in MDOS. Wouldn't it be nice to be able to re-enter a program like MY-Art by running a 2 sector program instead of re-loading the complete MY-Art program? It is possible. The CP/M guys have been doing it for years. Here is how.

The first executable instruction of each and every program written to run out of MDOS should be a NOP. Why? If it is, then a second program could be loaded into the same address (0400) and not overwrite that first, critical address of the original program.

So you run your program, and the computer starts it up at >0400. It does its thing, and you exit. You decide you'd like to re-enter the program but it takes so long loading it from floppy. Instead, you run this little program, which I'll call GO:

```
NOP
END
```

And it loads into the computer at >0400, too. Did it overwrite the program still in memory? Absolutely not. Will it start running at >0400 and continue straight into the first instruction of the original program, the one you'd like to re-enter? Absolutely yes!

Let's include the NOP as the first instruction in any MDOS program that we write, and make GO one of our MDOS commands.

## A different approach

Richard Lindway, a member of the Central Pennsylvania 99/4A User Group, writes:

In the December 1987 MICROpendium there was an article describing how to install Extended BASIC into a 4A console. The thing I didn't like was you couldn't have a cartridge in the port at the same time. With a little research and some questions to the group's hardware expert, I was able to come up with a small change to the project. One note before I continue: this change won't work with Super Extended BASIC. Also, you can't have a Super Cart in the port while using Extended BASIC. Don't forget that Extended BASIC and other chips on the main board can be damaged by static electricity, so take the necessary precautions.

This addition requires two extra wires, one extra resistor and the cutting of two foil paths which are not on the main board.

The first step is to solder the ribbon cable and other wires as described in the December article, except for the switch. There is where some of the changes occur. You may also skip attaching the wire to pin No. 9 bottom on the main board. This will be attached elsewhere later.

With or without the metal shield on the top of the main board, install the cartridge PC board in the main board socket. Make sure the main board is supported to prevent breakage and the cartridge board is properly seated in the main board socket. Using a felt tipped pen, draw a line on the cartridge PC board at the top of the main board socket. Do not use pencil, the carbon in the lead may cause problems no

matter how well you erase it. Also, some black inks contain carbon, so avoid them, too.

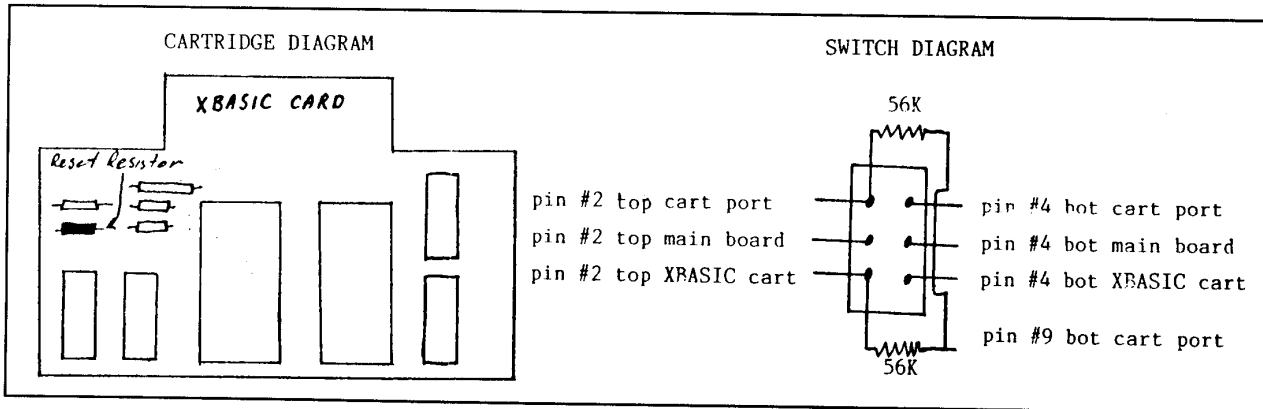
This is where the two foil paths will be cut. The top of the cartridge is on the back of the PC board and the bottom is on the front. Remove the cartridge PC board, locate the foil paths for pin No. 2 top and pin No. 4 bottom and cut the foil about 1/8-inch above the line on two foil paths. Solder 2 8-inch wires to the pins on the back of the cartridge PC board to pin No. 2 top and pin No. 4 bottom. Solder 6 (not 5) wires and the extra 56K ohm resistor to the switch (see switch diagram). The two free ends of the resistors will be soldered together and a single wire used for pin No. 9 bottom.

If you wish, the wire for pin No. 9 bottom may also go to the cartridge socket. This way there will be only one wire to pin No. 9 bottom on the main board. The wires coming from the cartridge socket should be kept close to the PC board and the metal shield to prevent interference when installing the main board in the console. A little tape is a big help here.

This completes the changes, except for one extra step. The reset resistor should be removed from the Extended BASIC cartridge (see cartridge diagram). Alternately, pin No. 1 bottom need not be used. If the resistor isn't disabled, the computer may not reset whenever a cartridge is installed in the port no matter which position the switch is in.

One last note: cartridges shouldn't be installed or removed from the port while using Extended BASIC. It could crash the computer.

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# User Notes

## Alpha coder and retriever

In January we published two programs by Floyd Donaldson of Buckingham, Quebec. The programs allow the transfer of numeric variables between programs using the memory area reserved for character definitions. Included here are companion programs called Alpha Coder and Alpha Retriever, which permit transferring string or alphanumeric variables from one program to another. Although these programs use the same memory area of character blocks (128-143), this can be changed if the user wants to employ both alpha and numeric routines in a program.

Alpha Coder and Alpha Retriever work on the same principal as their numeric counterparts. In Alpha Coder, the string INPUTed is converted into its ASCII value character by character, turned into a string (CODE\$) and then stored in (HX\$). CALL CHAR loads the string into characters 128, 129 130 and 131, and then waits for the user to load in the second program. In Alpha Retriever, the program uses CALL CHARPAT to retrieve the 3 digit ASCII code in characters 128-131 by reversing the process in the first program and then storing the string in (RCODE\$). When there is no more valid numbers (>0 & <256) the program halts and prints the string.

With imagination and a bit of manipulation, a programmer could create a series of text or graphic adventure games or any other type of program in just Extended BASIC, exceeding the TI's 16K memory a hundredfold.

The maximum number of characters that can be INPUTed in the first program is 21 characters. Although the program can be changed to transfer from 4 to 8 alphanumeric strings.

```
5 REM ALPHA CODER by Floyd D
onaldson !136
10 INPUT " NAME? ":A$ !026
20 FOR A=128 TO 143 :: CALL
CHAR(A,"")!054
30 NEXT A !215
40 FOR A=1 TO LEN(A$)!221
50 CODE=ASC(SEG$(A$,A,1))!10
9
60 CODE$=STR$(CODE)!096
```

```
70 IF LEN(CODE$)<2 THEN CODE
$="0"&CODE$ !091
80 IF LEN(CODE$)<3 THEN CODE
$="0"&CODE$ !092
90 HX$=HX$&CODE$ !061
100 NEXT A !215
110 CALL CHAR(128,HX$)!209
115 REM MAXIMUM 21 CHARACTER
S, CHARS 128,129,130,131 !02
8
120 RUN "CS1" !058
```

```
5 REM ALPHA RETRIEVER by Flo
yd Donaldson !211
10 CALL CHARPAT(128,A$,129,
H$,130,C$,131,D$)!231
20 C$=A$&H$&C$&D$ !036
30 NEXT A !215
40 FOR A=1 TO LEN(A$)!221
50 CODE=ASC(SEG$(A$,A,1))!10
9
60 CODE$=STR$(CODE)!096
70 FOR A=1 TO LEN(C$)STEP 3
!202
80 C=C$&SEG$(C$,A,3)!056
90 IF VAL(C$)=0 THEN 120 !
087
100 RCODE$=RCODE$&CHR$(VAL(C
C$))!006
110 NEXT A !215
115 REM MAXIMUM 21 CHARACTER
S, CHARS 128,129,130,131 !02
8
120 PRINT "HELLO, ";RCODE$;"
" :: END !005
```

## High score for poker game

This comes from James W. Wiegand, Ridgeley, West Virginia. He writes:

Regena's great program, *Poker Solitaire*, lacks only the ability to save and display the high score of more than one game. Adding the following lines make the game even more enjoyable. Also note line 115 which saves a lot of searching for future references.

```
Regena is super. Keep up the good
work.
115 REM MICROPENDIUM NOV. 1
987
265 HSCORE=0
1542 IF HSCORE>TSCORE THEN 1
550
1545 HSCORE=TSCORE
```

```
1555 HSCORE$=STR$(HSCORE)
1560 TS$="SCORE--"&TSCORE$&"
HSCORE$--"&HSCORE$
2592 IF HSCORE>TSCORE THEN 2
594
2593 HSCORE=TSCORE
2594 PRINT "HIGH SCORE--";HSC
ORE:::
```

## Changing colors in My-Word

This is from Ken Woodcock of Norfolk, Virginia. He writes:

You say you're not happy with some of the six color combinations available by using CTRL 3 in the My-Word editor? Well, you don't have to be stuck with what they gave you.

To install your own choices, break out your handy sector editor and get to work. The sector that you want is the third sector of the file EDITOR. Starting with byte >80 you will see 87F4 87F3 8717 87F1 87F6 871A (in hexadecimal). Leave the 87s alone. The byte following each 87 contains foreground and background color for one choice. Example: the first choice is 87F4. The F sets the foreground color to white, the 4 sets the background color to dark blue. If you don't like that, change it to suit yourself.

When you start up after making the changes, you will still have the last colors that you saved with SaveOptions (SO), but only the new combinations can be selected with CTRL 3. Below is the color table:

Code	Color
0	Transparent
1	Black
2	Medium green
3	Light green
4	Dark blue
5	Light blue
6	Dark red
7	Cyan
8	Medium red
9	Light red
A	Dark yellow
B	Light yellow
C	Dark green
D	Magenta
E	Gray
F	White

(See Page 36)

# User Notes

## CALL CHAR characters

Here are some ready-made characters that can be used in any BASIC or Extended BASIC program. The CALL CHAR statement uses zero (48) as the designated character, but any available character may be substituted. The CALL CHARs were published by Rick Kellogg in the MICRO newsletter in Bloomington, Illinois.

### Slashed zero

CALL CHAR(48,"0038444C54644438")

### Right arrow

CALL CHAR(??,"000804027F020408")

### Left arrow

CALL CHAR(??,"00102040FE402010")

### Up arrow

CALL CHAR(??,"081C2A4908080800")

### Down arrow

CALL CHAR(??,"00080808492ALC08")

### Solid line

CALL CHAR(??,"00FF")

### Copyright symbol

CALL CHAR(??,"003E415D515D413E")

### PI symbol

CALL CHAR(??,"0000FE2828282828")

### Cent sign

CALL CHAR(??,"00083C4848483C08")

### Check mark

CALL CHAR(??,"0002020404482810")

## Contact cleaner

This endorsement of contact cleaner was published in the newsletter of the Pomona Valley (California) Computer Group. We reprint it only for your information.

Lately, I've seen a number of articles about cleaning the contacts on the GROM port, card-edge connectors, etc. But no mention of what I consider to be the best contact cleaning solution on the market. It cleans, preserves and lubricates any type of metal contacts or connectors. It leaves no oily residue like some cleaner/lubricants, but improves electrical conductivity and removes contamination. It will preserve contacts and reduce wear. It is called Cramolin and is engineered to remove oxidation from any kind of fine electrical contacts and leave a mono-molecular conductive coating that protects even gold contacts.

It is available from Caig Laboratories Inc., 1175-0 Industrial Ave., (P.O. Box J),

Escondido, CA 92025, (619)743-7143. The Electronic Maintenance Kit, part No. K-100A, is \$16.95 (plus tax and \$1.75 shipping). The kit includes Cramolin and preserving Cramolin in a kit with lint-free wipes and applicators. The R-2 Spray Tech Kit, part No. K-100C, is \$9.95 (plus tax and \$1.95 shipping). This includes a spray can of the cleaning Cramolin and wiping pads.

*We recommend contacting the company for current pricing before ordering.—Ed.*

## Supertrace

Jim Peterson, of Tigercub Software, gave us permission to published his Supertrace utility. Peterson has written hundreds of utilities that run out of Extended BASIC and BASIC. This one requires a disk system and Extended BASIC.

Here's how the author describes Supertrace:

If you have ever used TRACE to debug a program, you know that it won't dump to a printer, and that it messes up the screen format. The new Super Extended BASIC, or the GRAM Kracker, will dump to the printer but you still won't know what is going on line-by-line or within multiple-statement lines. Now, Supertrace will break the program into single-statement lines and TRACE each statement in the lower left corner of the screen, or dump it to the printer, or both. And, you may pause at any time, or step through the program line-by-line.

Instructions for the program appear on screen.

```

90 REM PUBL. MICROpendium MA
Y 1988 :: All rights belong
to Jim Peterson (Tigercub So
ftware) !129
100 GOTO 140 !219
110 SET,C$,END$,Z$,E$,K$,S$,
K,S,IF$,OF$,G$,FL,TL,M$,LN,L
N2,P,T,LN$,A$,R,P$,GQ,PD$,KC
,KC$ !248
120 CALL CHAR :: CALL CLEAR
:: CALL COLOR :: CALL SCREEN
:: CALL KEY :: CALL SOUND !
058
130 !@P- !064
140 CALL CHAR(94,"3C4299A1A1
99423C"):: CALL CLEAR :: FOR
SET=1 TO 14 :: CALL COLOR(S
ET,13,15):: NEXT SET :: CALL

```

SCREEN(13)!238

```

150 C$=CHR$(157)&CHR$(200)&C
HR$(1)&"A"&CHR$(183)&CHR$(20
0):: END$=CHR$(255)&CHR$(255
):: Z$=CHR$(131)&CHR$(147)&C
HR$(154)&CHR$(163)!098

```

```

160 E$=CHR$(0):: K$=CHR$(182
):: S$=CHR$(130)!020

```

```

170 DISPLAY AT(2,5)ERASE ALL
:"TIGERCUB SUPERTRACE": :""

```

```

Tigercub Software for free":
"distribution but no price o
r copying fee may be charged"
:!programmed by Jim Peterson
1/88

```

```

180 DISPLAY AT(8,1):"Howeve
r, if anyone should feel m
oved to send me a few bucks
for the use of this progra
m, I would not be": "offended
!" !141

```

```

190 DISPLAY AT(15,1):"Jim Pe
terson": "156 Collingwood Ave
.": "Columbus, OH 43213" !003
200 DISPLAY AT(23,8):"PRESS
AY KEY" :: DISPLAY AT(23,8):
"press any key" :: CALL KEY(
0,K,S):: IF S=0 THEN 200 !05
1

```

```

210 DISPLAY AT(2,1)ERASE ALL
:" Will break each program":
"line into single statement"
:"lines, unless they contain
" !232

```

```

220 DISPLAY AT(5,1):"an IF,
and add a CALL to a": "subpro
gram which will": "display ea
ch line number in": "the corn
er of the screen as" !182

```

```

230 DISPLAY AT(9,1):"it is b
eing executed, or": "will out
put it to a printer." !216

```

```

240 DISPLAY AT(13,1):" Progr
am must first be -": "RESeq
uenced to great in": "cremen
ts than the number" !108

```

```

250 DISPLAY AT(17,1):"of sta
tements in any one": "line. (
recommend RES 100,20)": "an
d SAVED by": " SAVE DSK(file
name),MERGE" !165

```

```

260 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 260 !1

```

(See Page 37)

# User Notes

(Continued from Page 36)

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```

270 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 270 EL
SE CALL CLEAR !027
280 DISPLAY AT(3,1):"INPUT F
ILENAME?": "DSK" :: ACCEPT AT
(4,4):IF$ :: ON ERROR 290 ::
OPEN #1:"DSK"&IF$,INPUT ::
GOTO 300 !049
290 CALL SOUND(300,110,0,-4,
0):: DISPLAY AT(6,1):"CANNOT
OPEN FILE!" :: RETURN 280 !
180
300 DISPLAY AT(6,1):"OUTPUT
FILENAME?": "DSK" :: ACCEPT A
T(7,4):OF$ :: ON ERROR 310 :
: OPEN #2:"DSK"&OF$,VARIABLE
163,OUTPUT :: ON ERROR STOP
:: GOTO 320 !152
310 CALL SOUND(300,110,0,-4,
0):: DISPLAY AT(9,1):"CANNOT
OPEN FILE!" :: RETURN 300 !
200
320 DISPLAY AT(9,1):" Progra
ms of more than 50": "sectors
in length may become": "too
long to run if you break": "a
nd trace all lines." !099
330 DISPLAY AT(15,1):"Break
all lines? (Y/N)" :: ACCEPT
AT(15,24)SIZE(1)VALIDATE("YN
"):Q$ :: IF Q$="Y" THEN 360
!150
340 DISPLAY AT(17,1):"From l
ine?": "ACCEPT AT(17,12)VAL
IDATE(DIGIT):FL !047
350 DISPLAY AT(17,18):"To?"
:: ACCEPT AT(17,22):TL !131
360 DISPLAY AT(15,1):"TRACE
to 1": "" (1) Screen": (2)
Printer": (3) Both" :: ACC
EPT AT(15,10)SIZE(-1)VALIDAT
E("123"):QQ :: IF QQ=1 THEN
380 !100
370 DISPLAY AT(21,1):"Printe
r? PIO" :: ACCEPT AT(21,10)S
IZE(-18):PD$ !212
380 DISPLAY AT(3,1)ERASE ALL
:" Key code 1 allows the pro
-gram to run until you ho
ld": "down any key. It will b
e" !076
390 DISPLAY AT(6,1):"difficu

```

```

it to execute CALL": "KEYs in
the program.": "" Key code
2 requires a key": "to be pr
essed to execute" !066
400 DISPLAY AT(11,1):"each p
rogram line. You can": "step
through the program": "line b
y line, but this may": "be ve
ry slow if all lines" !039
410 DISPLAY AT(15,1):"are be
ing traced.": "" Key code 3
does not allow": "stopping t
he program." !023
420 DISPLAY AT(20,1):"Key co
de? 1" :: ACCEPT AT(20,11)SI
ZE(-1)VALIDATE("123"):KC !13
1
430 IF KC=1 THEN KC$=CHR$(19
1)&CHR$(192)&CHR$(200)&CHR$(
1)&"0" ELSE KC$=CHR$(191)&CH
R$(200)&CHR$(1)&"1" !138
440 DISPLAY AT(12,7)ERASE AL
L:"Working line" !235
450 LINPUT #1:M$ :: IF M$=EN
D$ THEN 600 !202
460 LN=ASC(SEG$(M$,1,1))*256
+ASC(SEG$(M$,2,1)):: IF Q$="
Y" THEN 470 :: IF LN<FL OR L
N>TL THEN PRINT #2:M$ :: GOT
O 450 !068
470 IF LN>LN2 THEN 490 !014
480 DISPLAY AT(12,1)ERASE AL
L BEKP:"ERROR! RESEQUENCE PR
OGRAM TO": "GREATER INCREMENT
S AND TRY": "AGAIN." :: CLOSE
#1 :: CLOSE #2 :: STOP !023
490 LN2=LN :: IF POS(Z$,SEG$
(M$,3,1),1)<>0 THEN PRINT #2
:M$ :: DISPLAY AT(12,19):LN
:: GOTO 450 !186
500 P=POS(M$,S$,3):: T=POS(M
$,CHR$(161),3):: IF T=0 THEN
530 !143
510 IF P=0 THEN PRINT #2:SEG
$(M$,1,LEN(M$)-1)&S$&C$&CHR$
(LEN(STR$(LN)))&STR$(LN)&K$&
E$ :: DISPLAY AT(12,19):LN :
: GOTO 450 !200
520 PRINT #2:SEG$(M$,1,P)&C$
&CHR$(LEN(STR$(LN)))&STR$(LN
)&K$&E$ :: DISPLAY AT(12,19)
:LN :: LN=LN+1 :: GOSUB 730
:: M$=LN$(SEG$(M$,P+1,255))::
GOTO 460 !226
530 IF P=0 THEN PRINT #2:SEG
$(M$,1,2)&C$&CHR$(LEN(STR$(L

```

```

N))&STR$(LN)&K$&S$&SEG$(M$,
3,255):: DISPLAY AT(12,19):L
N :: GOTO 450 !114
540 A$=SEG$(M$,1,P-1):: R=PO
S(A$,CHR$(132),3):: S=POS(A$
,CHR$(201),3)!201
550 IF R=0 THEN GOSUB 790 ::
GOTO 590 !199
560 IF S=0 AND R<>0 THEN GOS
UB 740 :: GOTO 450 !141
570 IF S<>0 THEN IF S-R<3 TH
EN GOSUB 790 :: GOTO 590 !22
3
580 GOSUB 740 :: GOTO 450 !2
02
590 LN=LN+1 :: LN2=LN :: GOS
UB 730 :: M$=LN$&SEG$(M$,P+1
,255):: P=POS(M$,S$,3):: GOT
O 530 !187
600 LN=29999 :: GOSUB 730 ::
PRINT #2:LN$&CHR$(131)&CHR$(
64)&CHR$(80)&CHR$(43)&CHR$(
0)!073
610 LN=30000 :: GOSUB 730 ::
PRINT #2:LN$&CHR$(161)&CHR$(
200)&CHR$(1)&"A"&CHR$(183)&
"X"&K$&E$ :: IF QQ=1 THEN 66
0 !172
620 LN=30001 :: GOSUB 730 ::
P$=LN$&CHR$(132)&"F"&CHR$(1
90)&CHR$(200)&CHR$(1)&"0"&CH
R$(176)&CHR$(159)&CHR$(253)&
CHR$(200)&CHR$(3)&"250" !073
630 P$=P$&CHR$(181)&CHR$(199
)&CHR$(LEN(PD$))&PD$&CHR$(13
0)&"F"&CHR$(190)&CHR$(200)&C
HR$(1)&"1"&S$&CHR$(156)&CHR$(
253)&CHR$(200)&CHR$(3)&"250"
&CHR$(181)&CHR$(214)!104
640 P$=P$&CHR$(183)&CHR$(200
)&CHR$(2)&"27"&K$&CHR$(184)&
CHR$(199)&CHR$(1)&"N"&CHR$(1
84)&CHR$(214)&CHR$(183)&CHR$(
200)&CHR$(1)&"6"&K$&E$ :: P
RINT #2:P$ !162
650 LN=30002 :: GOSUB 730 ::
PRINT #2:LN$&CHR$(156)&CHR$(
253)&CHR$(200)&CHR$(3)&"250"
&CHR$(181)&"X"&CHR$(180)&E$
!051
660 IF QQ=2 THEN 690 !012
670 LN=30003 :: GOSUB 730 ::
PRINT #2:LN$&CHR$(162)&CHR$(
240)&CHR$(183)&CHR$(200)&CH
R$(2)&"24"&CHR$(179)&CHR$(20

```

(See Page 38)

# User Notes

(Continued from Page 37)

```

0) &CHR$(1) &"1" &&CHR$(181) &
"X" &CHR$(180) &&CHR$(1232
680 IF KC=3 THEN 710 :013
690 LN=30004 :: GOSUB 730 ::
P$=LN&CHR$(157) &CHR$(200) &
CHR$(3) &"KEY" &CHR$(183) &CHR$(
200) &CHR$(1) &"0" &CHR$(179) &
"K" &CHR$(179) &"S" &&CHR$(1075
700 P$=P$&CHR$(130) &CHR$(132
) &"S" &&CHR$(176) &CHR$(201
) &CHR$(INT(LN/256)) &CHR$(LN-
256*INT(LN/256)) &&CHR$(1) :: PRINT
#2: P$ :055
710 LN=30005 :: GOSUB 730 ::
PRINT #2: LN&CHR$(168) &CHR$(
0) :: PRINT #2: CHR$(255) &CHR$(
255) :132
720 CLOSE #1 :: CLOSE #2 ::
DISPLAY AT(12,1) ERASE ALL: "E
nter NEW": : "Then Enter": "
MERGE DSK" &&CHR$(1) :: END :019
730 LN=CHR$(INT(LN/256)) &CHR$(
LN-256*INT(LN/256)) :: RET
URN :079
740 IF LEN(M$) > 150 THEN 760
:: PRINT #2: SEG$(M$, 1, 2) &&CHR$(
LEN(STR$(LN))) &STR$(LN)
&&CHR$(3, 255) :012
750 DISPLAY AT(12, 19): LN ::
RETURN :108
760 PRINT #2: SEG$(M$, 1, 2) &&CHR$(
LEN(STR$(LN+1))) &STR$(
LN+1) &&CHR$(1, 240)
770 DISPLAY AT(12, 19): LN :08
780 LN=LN+1 :: PRINT #2: CHR$(
INT(LN/256)) &CHR$(LN-256*INT
(LN/256)) &&CHR$(3, 255) ::
DISPLAY AT(12, 19): LN :: LN2=
LN :: RETURN :012
790 PRINT #2: SEG$(A$, 1, 2) &&CHR$(
LEN(STR$(LN))) &STR$(LN)
&&CHR$(3, 255) &&CHR$(1) ::
DISPLAY AT(12, 19): LN :: RET
URN :182

```

## NEWBYTES—

(Continued from Page 33)

Automatic backup of data from hard/floppy drives;

Multi-company capability with "profit centers" for each;

Optional "update" and "use" log files

protects from unwanted changes or mistakes;

Extensive "audit trail" and reference support;

"Browse and Scan" features provided for quick information retrieval (on screen);

"Hot Keys" provide maximum maneuvering capabilities throughout the system menus and on-line help screens;

Source code available for custom programming.

## MOUSE—

(Continued from Page 25)

mouse on a TI-99/4A would not be any quicker than our joysticks, unless someone were to come up with an interface that could read them and supply the information to the program in a manner as yet undefined. Besides, where are you going to get a serial mouse for thirty bucks?

## Reviewed in MICROpendium

1984

**February:** B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500.

**March:** Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer.

**April:** Monthly Budget\$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh.

**May:** Companion Word Processor, Q\*Bert, Mad-Dog I & II, Programs for the TI Home Computer.

**June:** Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II.

**July:** Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position

**August:** TE-1200, Tower, Galactic Battle, Galaxy

**September:** Wycove Forth, 99/4 Auto Spell-Check, QUICKCOPYer, Wizard's Dominion, Anchor Automation Mk XII Modem

**October:** Killer Caterpillar, ZORK I, Defender

**November:** 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X

**December:** Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

**January:** Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner

**February:** Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II

**March:** Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor

**April:** 9900 Micro Expansion System, Disk + Aid, Gemini 10X-15X

**May:** Character Sets and Graphics Design, Draw 'N Plot

**June:** GRAPHX, DATA BASE I

**July:** Acorn 99, Advanced Diagnostics

**August:** Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll

**September:** Midnight Mason, Myarc 32K/128K Card, GRAPHX Companion

**October:** 4A/TALK, Extende BASIC II Plus, XB Detective, Console Writer 2.a

**November:** Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor

**December:** Display Enhancement Package, Triple Tech

1986

**January:** BITMAC, Starcross

**February:** Night Mission, Peripheral Diagnostic Module, BA-Writer

**March:** Super Duper, Tunnels of Doom Editor, Business Graphs 99

**April:** U.S. Open Tennis, PRBASE

**May:** 4A Flyer, GRAM Kracker, Artist's Companion

**June:** Myarc Disk Controller Card, Maximem

**July:** Horizon RAMdisk, Old Dark Caves, Fun!writer, TI99/4A Macro Assembler

**August:** JOYPAINT 99, GPL Assembler, TI99/4A Intern, GPL Linker

**September:** Mechatronic 128K Card

**October:** TI-Forth Utilities, CorComp Memory Plus

**November:** Submarine Commander, PEP, MAX-RLE

**December:** GK Utility I and II and GRAM Packer, X-10 Powerhouse, RAVE 99/101.

1987

**January:** MG DISKASSEMBLER, Myarc XBII

**February:** TI-Tax, Mechatronic Mouse

**March:** Wycove Forth version 3.0, DJIT Systems RGB Conversion Kit, Spad XIII Flight Simulator

**April:** Geneve 9640, Disk Utilities

**May:** QS-Solitaire, Geneve 9640 (Part 2), Technical Drive, Console Calc

**June:** Character Sets and Graphic Design III, Writerease Ver. 1.1, 4A DOS, Prescan\_It

**July:** Junkman Junior, Avatex 1200/1200hc modem, Bubble Plane

**August:** Prostick, The Brain, Rocketman, Menu Ver. 6.3

**September:** TI-IBM Connection, Super Extended BASIC

**October:** Fontwriter, Mechatronic 80-Column Card, Star NP-10 printer

**November:** Legends, Music Preprocessor, QS-Wheel, Spin-to-Win

**December:** Remind Me, Certificate 99, Myart-Art and Myarc Mouse

1988

**January:** Quik Font, EZ-Keys

**February:** Disk Utilities 4.0

**March:** Telco, String Master, Epson LX-800 printer

**April:** Super Space II, PC-Transfer, Archiver II Ver. 2.4, Calendar Maker

# Classified

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