
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 10 Number 1

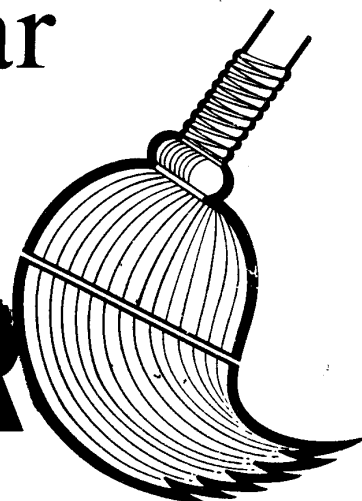
February 1993

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Attention Hobbyists & Gadget Lovers: Tex Comp has a limited supply of brand new Oscar DataBak readers in factory sealed cartons (complete with cable for the TI-99/4A) & packs of assorted bar code software. Complete package. No Warranties. **\$2.95** when purchased together with the above offer. Cannot be purchased separately.

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The Point of Sale subprogram will generate a printed invoice for you immediately after entering order and customer data, or use the Batch Entry option for printing labels. You can also search back and generate labels and/or reports from any one of nine different fields.

Mail List

The program will create up to 1,000 names and addresses. Adding, deleting or changing addresses is a simple task, and you can design your own form for printing labels. You can also search back and generate labels and/or reports from any one of nine different fields.

Inventory Control

The program will create up to 1,000 items. Once stored on the screen, you can be located by record number, item number or description, and displayed or printed out for your reports.

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MICROpendium

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*READ THIS

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

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

Comments

When a virus isn't a virus

Last month's virus scare is this month's sigh of relief. A number of TI users called and wrote to explain the problem that was described in last month's issue as a virus was really a problem with the Horizon RAMdisk. Here's the explanation from Allen Rogers, of Clearwater, Florida:

"The problem Bill Gaskill encountered is in the hardware of his Horizon RAMdisk and, in my letter to him, I advised that he contact Bud Mills, of Horizon Computer, who would probably fix it for him gratis.

"You see, about two years ago I alarmed several members of the Cin-Day user group (to which I also belong) by telling them

that I had this problem. Finally, one of them suggested that I call Bud Mills. I did that and he knew right away what the problem was. He told me to send the HRD card to him and he would fix it and return it.

"It seems that what makes it appear to be a virus is the unfortunate choice of the "I GOTCHA!" in one of the messages in the ROS (RAMdisk Operating System) software. However, the problem is generated by the HRD hardware and must be fixed before it is safe to keep it in the system. Using the system without repairing the HRD could destroy more disks."

I've also been told that the !I GOTCHA! message was programmed into the Horizon ROS by Gary Bowser of OPA. Bowser has said that "I thought I had gotten rid of that thing."

So, in any case, TI users can breathe a little more easily. I'm sorry if I may have alarmed anyone by printing the virus article last month, but at the time I thought it was better to get the information out just in case it proved to be as infectious as computer viruses in the PC/Mac worlds. The fact that it turned out not to be a virus is, in my opinion, very good news indeed.

CHARLES KIRKWOOD RETIRES COLUMN

Charles Kirkwood Jr. has written his last c99 column for MICROpendium. Charles has written his column for several years, which he modestly titled Trials of a c99 Beginner. Many readers were introduced to c99 by Charles and he has corresponded with a number of them, from as far away as Germany. Thanks, Charles.

STARTING OUT TENTH YEAR

It's hard to believe, but MICROpendium is starting its tenth year with this edition. I had no idea back in 1984 that we would be around this long. I am flabbergasted just to think about it. Of course, it's all your fault. If it hadn't been for the incredible loyalty of our readers, we would have gone south long ago. Thanks to all of you as we start our tenth year. I hope we continue to deserve your support in the years to come.

—JK

BUGS & BYTES

Talking of Michelangelo ...

Apropos of the recent discussion of the TI "virus," Jerry Price of Tex-Comp recalls that company getting a lot of inquiries about last year's Michelangelo scare. He says they finally sent out a lot of postcards explaining that TI software was safe from Michelangelo.

There's not much danger of a TI virus, he says, noting that disks Tex-Comp sends out are tested and "virus-free."

Hands across the sea?

Several individuals have written to us about a Rumanian TI user who wants software. We have seen his request in a number of users group letters, and it was printed in the *Orange County Register* where it was seen by TI personnel, who sent him some cartridges. Also, we have received a form letter from him a couple of times ourselves.

We have received similar requests from users in the United States, however, and have sent them back as inappropriate. We want to have consistent policies.

1993 TI FAIRS

FEBRUARY

Fest West "North" 93, Feb. 13-14, Howard Johnson Hotel, Salt Lake City, Utah. Contact Fest West "North" 93 Committee, 1396 Lincoln Apt. B, Ogden, UT 84404 or Salt Flats BBS. (308) 394-0064.

APRIL

Northeast TI Fair, April 17, Waltham High School, Waltham, Massachusetts. Contact Ron Williams, 14 East St., Avon, MA 02322.

Canadian TI Fest, April 24, Merivale High School, Nepean, Ontario, Canada. Contact Bill Gard, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6 or (613) 523-9396 or Fax (819) 997-2194 Attn: DMES 2.

MAY

Lima Multi User Group Conference, May 14-15, Ohio State University Lima Campus, Lima, Ohio. Contact Dave Szipp, 4191 Patterson Haplin, Sidney, OH 45365; phone (513) 498-9713 (evenings).

Fourth Annual TI Orphans Reunion, May 15, Zurich Insurance Claims Centre, 9715 Ottewell Rd., Edmonton, Alberta, Canada. Contact Ron Hohman, (403) 456-0862.

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

Feedback

Two-computer family

I do not understand a lot of the computer terms in the MICROpendium — but I want to continue support of your continued information on the antique TI99/4A.

My husband wanted me to give my TI99/4A to our son when he brought home his IBM, but I have too much invested to just give it away — even to a son — so it's His and Her computers.

Wanda Clark
Austin, Texas

Exercise in nostalgia

I am finally getting around to responding to your request for comments on raising the price of MICROpendium

I have found the journal extremely interesting and valuable over the past decade, but as I have stabilized my usage of the TI99/4A the amount of new information which I find useful has decreased and I find myself continuing my subscription as an exercise in nostalgia. I might drop my subscription anyway when it comes time for renewal or, if the price is not increased, I might continue for another year.

Kenneth J. Arnold
Chatham, Massachusetts

Doesn't want more

I just wanted to reply to your Comments column of October 1992 on 32 pages vs. 40 pages. I am quite pleased with the magazine (MICROpendium) I am receiving now. To receive additional pages and have a subscription increase are of no interest to me or to other subscribers in a similar situation.

Let me describe my setup and situation briefly — I have two complete TI99/4A set-ups: consoles, expansion boxes nearly filled, most game modules, printers, CorComp managers and enhancements. But when I receive the magazine I normally read through the Feedback column and Comments column, then look for new hardware or software to purchase (when I am looking for software), then lay it aside. Columns such as "The Art of Assembly Language — Part 18" are so far above my

knowledge level or need level I don't much more than scan them. The same goes for "File Conversions" (December 1992). I understand the people who write these articles are good people and work hard to do these articles, but more pages to get that information will be of no value to users like me. I have purchased several software programs and updated versions over the last six years (three last year), but I assume there will be a parting of the ways when the magazine is increased in size and price. Thank you for allowing me to voice my opinion.

Harold Armstrong
Elizabethtown, Kentucky

TI still cares

Recently, I sent a letter to Texas Instruments asking about the availability of some schematics for the P-Box cards and cartridge GROMs. Imagine my surprise when 10 days later a packet arrived instead of a letter. Inside were the materials that I had asked about — including an Editor/Assembler GROM chip (which I put to immediate use!). This would indicate that perhaps many other cartridge GROMs are still to be had from TI.

They are a trusting lot and send along an invoice with your order. The shipping charges are nominal — \$1 for shipping and handling and Texas state tax. I would encourage anyone who wants to place an order with TI to do so and pay the account as soon as possible. It is difficult to find a company that still supports a product 10 years after it has ceased production. *Don't ruin a good thing!*

Here is the address for those of you who are interested in parts and schematics for your TI: Texas Instruments Inc., P.O. Box 53, Lubbock, TX 79408-0053. Incidentally, the toll-free phone number, 1-800-TI-CARES, is still listed on the letterhead.

Bob Carmany
Greensboro, North Carolina

Still loyal

I would be happy to pay an increased subscription rate, if for no other reason than to know what is going on and what

new hardware and software is coming out. Our local group, I'm sorry to say, has dwindled down to four members; three of us have Geneves, the fourth mostly uses a PC, but his children use the 99/4A and, darn it, we have been friends since 1983, and we still meet twice a month.

I realize that members of large groups and those with modems can easily keep up with what's going on, but how about those who don't but still are users of the *Good Old Girl* and many the newer kid on the block. I have no interest in a modem, but I still want to know what's going on. I have been helping a young man in North Carolina who has just a bare bones 99/4A system who is eager to learn what it's all about and obtain programs etc. He has joined the Lima Group, so I have been hearing less from him after I suggested that he contact them.

Ed Hintermeier
Macon, Georgia

Accuracy counts

I enjoy MICROpendium a great deal, even though I have been a nitpicker at times! I would gladly pay more for a beefed up publication if you decide to do this. As support for the TI withers, however, I wonder where you would get the material.

I have one little tidbit that might help. That is the accuracy program you published in the July 1984 issue. I entered it in "qBASIC" on my cousin's 386DX computer. As a result, I still have not yet purchased a PC. I use BASIC and XB a great deal, and I like science problems. This accuracy becomes quite important if you do astronomy problems. I'm wondering if these PC BASICS have not been rewritten since the days of the XT.

Owen L. Mayer
Hoffman Estates, Illinois

OS99's power lies in extendability

We would like to add to the review of OS99 that appeared in May 1992. As mentioned, it is an Editor/Assembler simulator (See Page 7)

Feedback

(Continued from Page 6)

tor. It provides all the E/A functions as two-letter commands: ED—Edit, LO=Load, SA=Save, etc. What was alluded to, but not made clear, was its extensibility. Since this is one of the main features of OS99 we would like to expand on the point.

Having the E/A functions available as two-letter commands requires that these commands be recognized by OS99 and appropriate action taken. These commands are internal to OS99. Extensibility occurs because of what happens if a command (of any length) is not recognized as an internal command. In such cases it is assumed to be the name of a program-image file on the default device. This file is looked for and, if found, loaded and run. Effectively, E/A option 5 programs are OS99 commands with the command being the name of the file. Since such programs are outside of OS99 their functionality is completely up to their author; they are external commands.

This feature has been taken a step further. Some OS99 parameters and the command line itself are made available. Access to these parameters allows user-written programs to determine their activity from the same line that invoked them. An example of this is the external command LD (List Directory) which is part of the OS99 package. This command is no more than an image program on the default device with the name of LD. The first thing LD does is look at the command line that invoked it to determine which disk to list the directory of; it expects a number.

Operating in CPU RAM instead of GROM, external commands execute faster than internal commands. They also have complete access to the system's resources. V.3 required the user to obtain the desired parameters from GROM and/or VDP memory. V.4 places them in PADD for the user to access directly this simplifies the program interface considerably.

Guy Neubert

Kirkland, Washington

For more on the release of OS99 V.4,

see Newsbytes this issue — Ed.

Drives 1 and 2

In response to your printing my remarks about 3.5-inch drives in your January issue being used only as Drives 1 and 2, this is correct, but let me explain further.

All 5.25-inch drives that I have seen have had jumpers on the back side of the drive for four positions. All disk controllers I have seen have been able to control four drives in positions 1, 2, 3 and 4. When the industry came out with the 3.5-inch drive, most of IBM and their clones had gone to two drives, one 5.25-inch high density and one 3.5-inch high density drive. This meant a need for only two drives and the industry went to two jumpers on the 3.5-inch drives. Therefore, you can use the 3.5-inch drives only in positions 1 and 2. The only exception, to my knowledge, is as follows: those that have a Myarc HFDC (hard and floppy disk controller) can use four 3.5-inch drives if another controller is used along with the HFDC. I am using a Cor-Comp controller to control drives 1 through 4 (TEAC 5.25-inch DS/DD) and with the HFDC I am using two 3.5-inch drives in positions 1 and 2 on this controller and two 5.25-inch 720K drives in positions 3 and 4. I could use four 3.5-inch drives if I place two drives in positions 1 and 2 of the Cor-Comp controller (formatted as 360K) and two in positions 1 and 2 of the HFDC controller (formatted at 720K). As the 3.5-inch drives have only two jumpers, you cannot jumper them to positions 3 and 4 (no jumpers for these positions). I hope that this will clear up the misunderstanding about the difference in the 3.5-inch and 5.25-inch drives besides the size of the drives and the amount of sectors that they will format at.

Richard C. Arthur Jr.
Tallahassee, Florida

More on drives

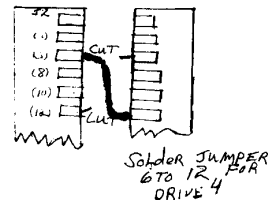
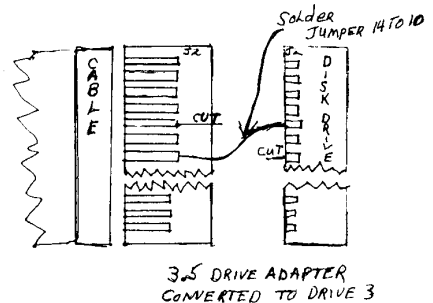
I wrote an article about 3.5-inch drives for our Brea Users Group newsletter and it was printed in your December issue. Thanks for publishing the article Now on

page 28 in January I read where you can use only two 3.5-inch drives.

Let me throw some light on the subject.

The drive manufacturers produce different ways for interfacing their particular hardware to the systems.

The majority of computers today have only two disk drives. Therefore, some manufacturers have a switch with 1,2,3,4 on the side of the drive. Some have a select strap to place across the pins (D0,D1,D2,D3) of the drive you wish. There are other methods, but we will take a simple route.



Now comes the big problem!

Some of the newer floppy drives are set up with only two positions (DSK1 or DSK2). This seems to confine the use of 3.5-inch drives to allow only two per setup. *Wrong!*

The normal setup would be for DSK1 to be a 5.25-inch floppy, as this will allow you to purchase disks and run them as received. It also allows you to use the autoload feature of X BASIC without having to copy the disk to a different sized disk.

DSK2 can be a 3.5-inch drive without modification by setting the jumper to D1 or setting switch to 2.

If you use the above configuration, then you will have to modify the cable or
(See Page 28)

BASIC

Word problems in algebra

By REGENA

I have been substitute teaching mathematics in secondary schools, tutoring and teaching a university class in intermediate algebra. Many students see a word problem (story problem, application problem, verbal problem) and gasp, "Oh, no! Word problems!" and won't even try to solve it.

The practical application of algebra, however, comes in the form of word problems, and they do not have to be difficult. In fact, most people have been solving similar arithmetic problems since they were five years old. Real life situations present algebra problems; we just don't always write equations and solve for "x."

This program for the TI writes typical algebra word problems for the student to solve and get practice. These problems use only first degree equations (no x-squared) with one variable. The student should have paper and pencil handy to solve the problem, then enter the answer. The computer will either give a "correct" response or will print the correct answer.

How do you solve a word problem? First read through the entire problem to see what is asked. Next read the problem again and start setting up the unknowns. Draw a picture if applicable. When the unknowns are identified and defined, set up the basic equation. Start at the beginning and read the problem again to see if the equation really does match the problem. Solve the equation. Using the solution, answer the question asked in the problem. (Sometimes you can solve for "x" but the answer may not be the "x" solution.) Make sure you have the correct units. If the equation had any minus signs, recheck your arithmetic to make sure all the signs are correct. Read the problem once more to see if the answer makes sense. Finally, check the answer.

This computer program uses random names and numbers in 10 basic algebra problems. The first problem is that one number is more than or less than a multiple of the second number. Their sum is given, and the student needs to find the two numbers. The second problem involves the perimeter of a rectangle with the length a multiple of the width.

The third problem is the sum of three or four consecutive, consecutive even or consecutive odd integers (whole numbers). The fourth problem gives a total amount of money and the student needs to tell how many nickels, dimes and quarters there

are. The fifth problem uses two boxes of different weights. If the total weight is given, the student tells how many of each type of box is on the truck. The sixth problem is a salary and commission problem with two different commissions.

The seventh and eighth problems are distance problems (distance = rate x time). The ninth problem is another rate problem with working at two different rates. The tenth problem is selling tickets at two different prices.

Lines 140 and 150 define functions for the random numbers. R(N) is a random number from 1 to N. R5 is a random number from 1 to 5. Lines 220-260 use DATA statements to define five possible situations for the problems. G\$ and B\$ are the girl and boy names, N\$ is the written number, NN\$ is the written ordinal number and U\$ is units.

Lines 310-350 go through the 10 problems using subroutines. After the 10 problems, Lines 360-410 offer the option to do 10 more problems or end the program. Lines 420-460 are a subroutine to press Enter to continue. Lines 470-510 are a subroutine to convert a number to money notation in a string variable. The rest of the program contains the subroutine for each type of problem.

You can adapt this program to print review pages or quizzes (a different one for each student if you wish). After each PRINT statement in the program that prints the problem, put in a PRINT statement for the printer (adjusting for margins). Change the names of all the answers so after all the questions are printed you can print all the answers on a separate sheet for an answer key.

You may change these problems by changing a particular subroutine, or you may add more problems. Of course you may also put different names in the DATA statements for the boys and the girls. If you use longer names, be sure to check the printing to see how it comes out on our 28-character screen.

You may also wish to print the equation on the screen when you print the correct answers. Convert numbers to strings so the equation can be printed without extra spaces.

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

WORD PROBLEMS

```

100 REM WORD PROBLEMS !186
110 REM FIRST-DEGREE EQUATIO
NS !052
120 REM BY REGENA !071
130 DIM G$(5), B$(5), N$(5), U$
(5), NN$(5), ANS(4) !232
140 DEF R(N)=INT(N*RND+1) !05
1
150 DEF R5=R(5) !139
160 CALL CLEAR !209
170 PRINT TAB(7); "*** ALGEBRA
***" !099
180 ML$(1)="MORE" !224
190 ML$(2)="LESS" !229
200 PRINT : : " FIRST-DEGREE
EQUATIONS" !095
210 PRINT : :TAB(7); "WORD PR
OBLEMS": : : !139
220 FOR J=1 TO 5 !061
230 READ G$(J), B$(J), N$(J),
N$(J), U$(J) !114
240 NEXT J !224
250 DATA CHERY, RICK, ONE, FIRS
(See Page 9)

```


REGENA ON BASIC —

(Continued from Page 8)

```

T, INCHES, CINDY, BOB, TWO, SECON
D, FEET, ANGIE, RANDY, THREE, THI
RD, METERS !236
260 DATA KATHY, BRETT, FOUR, FO
URTH, KM, JODIE, KELBY, FIVE, FIF
TH, MILES !129
270 PRINT "THERE WILL BE TEN
PROBLEMS." !174
280 PRINT : : "PRESS <ENTER>
TO START." !040
290 CALL KEY(3,K,S)!190
300 IF K<>13 THEN 290 !024
310 FOR J=1 TO 10 !106
320 RANDOMIZE !149
330 CALL CLEAR !209
340 ON J GOSUB 530,760,950,1
290,1550,1740,1960,2120,2280
,2490 !255
350 NEXT J !224
360 PRINT "CHOOSE:" !101
370 PRINT "1 TEN MORE PROBL
EMS" !166
380 PRINT "2 END PROGRAM" !
12
390 CALL KEY(3,K,S)!190
400 IF K=50 THEN 2710 !213
410 IF K=49 THEN 310 ELSE 39
0 !069
420 PRINT : : "PRESS <ENTER>
TO CONTINUE." !002
430 CALL KEY(3,K,S)!190
440 IF K<>13 THEN 430 !164
450 CALL CLEAR !209
460 RETURN !136
470 M$=STR$(MONEY)!255
480 RT$=SEG$(M$,LEN(M$)-1,2)
!014
490 LT$=SEG$(M$,1,LEN(M$)-2)
!008
500 MONEY$="$"&LT$&"."&RT$ !
002
510 RETURN !136
520 REM TWO NUMBERS !016
530 A=R5 !134
540 X=R5 !157
550 T=R(4)+1 !137
560 ML=R(2)!017
570 X2=A+T*X !185
580 IF ML<2 THEN 600 !170
590 X2=T*X-A !186
600 IF X=X2 THEN 530 !177
610 SUM=X+X2 !086
620 PRINT "ONE NUMBER IS";A;

```

```

ML$(ML);" THAN ";N$(T);" TIM
ES ANOTHER. ";!183
630 PRINT "IF THEIR SUM IS";
SUM;"WHAT ARE THE NUMBERS?";
: !185
640 INPUT "ONE NUMBER IS ":A
NS1 !214
650 INPUT "THE OTHER NUMBER
IS ":ANS2 !126
660 IF ANS1=X THEN 690 !218
670 IF ANS1<>X2 THEN 700 !21
5
680 IF ANS2=X THEN 720 ELSE
700 !001
690 IF ANS2=X2 THEN 720 !043
700 PRINT : : "THE CORRECT NUM
BERS ARE":X;"AND";X2 !199
710 GOTO 730 !043
720 PRINT : : "CORRECT." !021
730 GOSUB 420 !245
740 RETURN !136
750 REM RECTANGLE !111
760 W=R5+5 !091
770 T=R(4)+1 !137
780 L=W*T !120
790 P=W+L+W+L !151
800 U=R5 !154
810 PRINT "THE LENGTH OF A R
ECTANGLE IS";N$(T);" TIMES T
HE WIDTH." !173
820 PRINT "THE PERIMETER IS"
;P;U$(U);"." : "WHAT ARE THE D
IMENSIONS OF THE RECTANGLE?"
!048
830 PRINT : "WIDTH IN ";U$(U)
;!027
840 INPUT ANS1 !165
850 PRINT : "LENGTH IN ";U$(U)
);!094
860 INPUT ANS2 !166
870 IF ANS1<>W THEN 910 !119
880 IF ANS2<>L THEN 910 !109
890 PRINT : "CORRECT." !096
900 GOTO 920 !234
910 PRINT : "THE CORRECT DIME
NSIONS ARE":W;U$(U);" BY";L;
U$(U)!121
920 GOSUB 420 !245
930 RETURN !136
940 REM CONSECUTIVE !034
950 NU=R(2)+2 !215
960 ST=R(2)!031
970 A=R(20)+10 !214
980 SUM=A !244
990 FOR JJ=2 TO NU !045
1000 SUM=SUM+A+ST*(JJ-1)!146
1010 NEXT JJ !042
1020 W$="" !000
1030 IF ST<2 THEN 1070 !144
1040 W$="EVEN " !083
1050 IF A/2=INT(A/2)THEN 107
0 !041
1060 W$="ODD " !251
1070 PRINT "THE SUM OF ";N$(
NU);" CONSECUTIVE" !094
1080 PRINT W$;"INTEGERS IS";
SUM !099
1090 PRINT "WHAT ARE THE NUM
BERS?": : !138
1100 FOR JJ=1 TO NU !044
1110 PRINT NN$(JJ);" NUMBER"
;!124
1120 INPUT ANS(JJ)!117
1130 NEXT JJ !042
1140 IF ANS(1)<>A THEN 1200
!186
1150 FOR JJ=2 TO NU !045
1160 IF ANS(JJ)<>A+ST*(JJ-1)
THEN 1200 !060
1170 NEXT JJ !042
1180 PRINT : "CORRECT." !096
1190 GOTO 1260 !063
1200 PRINT : "THE CORRECT NUM
BERS ARE" !118
1210 AA=A !129
1220 FOR JJ=1 TO NU !044
1230 PRINT AA !030
1240 AA=AA+ST !042
1250 NEXT JJ !042
1260 GOSUB 420 !245
1270 RETURN !136
1280 REM COINS !086
1290 NIC=R(9)+1 !020
1300 T=R(4)+1 !137
1310 A=R(4)+1 !118
1320 DI=T*NIC !060
1330 QU=NIC+A !064
1340 SUM=5*NIC+10*DI+25*QU !
229
1350 MONEY=SUM !059
1360 GOSUB 470 !039
1370 PRINT G$(R5);" HAS ";N$(
T);" TIMES MORE" !249
1380 PRINT "DIMS THAN SHE H
AS NICKELS." !142
1390 PRINT "SHE HAS";A;"MORE
QUARTERS" !141
1400 PRINT "THAN NICKELS. I
(See Page 10)

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REGENA ON BASIC—

(Continued from Page 9)

```

F SHE HAS" !201
1410 PRINT MONEY$;" , HOW MAN
Y OF EACH": "TYPE OF COIN DOE
S SHE HAVE?": :!089
1420 INPUT "NICKELS " :ANS1
!115
1430 INPUT "DIMES " :ANS2
!029
1440 INPUT "QUARTERS " :ANS3
!195
1450 IF ANS1<>NIC THEN 1500
!074
1460 IF ANS2<>DI THEN 1500 !
254
1470 IF ANS3<>QU THEN 1500 !
024
1480 PRINT : "CORRECT." !096
1490 GOTO 1520 !068
1500 PRINT : "THE CORRECT NUM
BER OF COINS:" !187
1510 PRINT NIC;"NICKELS":DI;
"DIMES":QU;"QUARTERS" !138
1520 GOSUB 420 !245
1530 RETURN !136
1540 REM BOXES !091
1550 BB=(R(4)+1)*10 !020
1560 B1=R(BB/2)+4 !241
1570 B2=BB-B1 !235
1580 SUM=20*B1+25*B2 !062
1590 PRINT "A TRUCK CARRIES
A LOAD OF" !229
1600 PRINT STR$(BB);" BOXES;
SOME ARE 20-LB." !141
1610 PRINT "BOXES AND THE RE
ST ARE 25-LBBOXES. IF THE T
OTAL WEIGHT OF ALL BOXES IS"
;SUM;"POUNDS," !253
1620 PRINT "HOW MANY OF EACH
TYPE ARE ONTHE TRUCK?": :!2
52
1630 INPUT "20-LB BOXES: " :A
NS1 !070
1640 INPUT "25-LB BOXES: " :A
NS2 !076
1650 IF (ANS1=B1)+(ANS2=B2)=
-2 THEN 1700 !071
1660 PRINT : "THE CORRECT ANS
WERS ARE:" !184
1670 PRINT B1;"20-LB BOXES"
!083
1680 PRINT B2;"25-LB BOXES"
!089
1690 GOTO 1710 !003
1700 PRINT : "CORRECT." !096
1710 GOSUB 420 !245
1720 RETURN !136
1730 REM SALES !082
1740 B=R5 !135
1750 SAL=10*R(4)+50 !056
1760 C1=R5 !185
1770 C2=R5 !186
1780 IF C2=C1 THEN 1770 !148
1790 CC=10*R(3)+10 !217
1800 CC1=R(CC-3)+1 !051
1810 CC2=CC-CC1 !117
1820 SUM=SAL+C1*CC1+C2*CC2 !
243
1830 PRINT B$(B);" WORKS PAR
T-TIME AT": "A STORE. HE EAR
NS A SALARY OF $";SAL;"PER W
EEK, PLUS" !161
1840 PRINT "A COMMISSION OF
$";C1;"ON": "EACH SHIRT AND $
";C2;"ON" !210
1850 PRINT "EACH PAIR OF PAN
TS HE SELLS." !181
1860 PRINT "ONE WEEK HE MADE
";CC;"SALES": "AND EARNED A T
OTAL OF $";SUM !147
1870 PRINT "HOW MANY SHIRTS
DID ";B$(B);"SELL?": :!234
1880 INPUT "NUMBER OF SHIRTS
: " :ANS1 !008
1890 IF ANS1=CC1 THEN 1920 !
012
1900 PRINT : "HE SOLD";CC1;"S
HIRTS." !246
1910 GOTO 1930 !224
1920 PRINT : "CORRECT." !096
1930 GOSUB 420 !245
1940 RETURN !136
1950 REM DISTANCE !037
1960 MPH1=5*(5+R(8))!129
1970 MPH2=5*(5+R(8))!130
1980 IF MPH2=MPH1 THEN 1970
!161
1990 T=3+R5 !086
2000 SUM=T*MPH1+T*MPH2 !207
2010 PRINT "TWO CARS LEAVE T
HE SAME SPOTAT THE SAME TIME
AND TRAVEL IN OPPOSITE DIRE
CTIONS." !199
2020 PRINT "IF ONE CAR IS TR
AVELLING AT";STR$(MPH1);" MI
LES PER HOUR AND THE" !037
2030 PRINT "OTHER AT";MPH2;"
MPH, HOW": "LONG WILL IT TAKE
FOR THEM TO BE";SUM;"MILES
APART?": :!000
2040 INPUT "HOURS: " :ANS1 !0
19
2050 IF ANS1=T THEN 2080 !07
4
2060 PRINT : "THE CORRECT ANS
WER IS";T;"HOURS." !052
2070 GOTO 2090 !129
2080 PRINT : "CORRECT." !096
2090 GOSUB 420 !245
2100 RETURN !136
2110 REM DISTANCE 2 !119
2120 MPH1=5*(5+R(8))!129
2130 MPH2=5*(5+R(8))!130
2140 IF MPH2=MPH1 THEN 2130
!066
2150 T=3+R(5)!140
2160 D1=T*(MPH1+MPH2)!165
2170 PRINT "TWO CARS ARE";D1
;"MILES": "APART. THEY DRIVE
TOWARD" !013
2180 PRINT "EACH OTHER, ONE
AT";MPH1;"MPH": "AND THE OTHE
R AT";MPH2;"MPH." !076
2190 PRINT "HOW LONG UNTIL ^
HEY MEET?": :!180
2200 INPUT "HOURS: " :ANS1 !0
19
2210 IF ABS(T-ANS1)<=.01 THE
N 2240 !253
2220 PRINT : "THE CORRECT TIM
E IS":T;"HOURS." !146
2230 GOTO 2250 !033
2240 PRINT : "CORRECT." !096
2250 GOSUB 420 !245
2260 RETURN !136
2270 REM WORK RATE !105
2280 B=R5 !135
2290 G=R5 !140
2300 RB=10*R5+10 !179
2310 RG=10*R5+10 !184
2320 IF RG=RB THEN 2310 !247
2330 TA=R(3)+1 !201
2340 TT=R(8)+5 !229
2350 SUM=RB*TA+RB*TT+RG*TT !
036
2360 PRINT B$(B);" CAN PROCE
SS";RB;"ITEMS PER HOUR, AND
";G$(G)!058
2370 PRINT "CAN PROCESS";RG;
"ITEMS": "PER HOUR." !198
2380 PRINT "THEY NEED TO PRO
CESS";SUM;"ITEMS." !201
2390 PRINT "IF ";B$(B);" WOR
(See Page 11)

```

THE ART OF ASSEMBLY — PART 20

The sounds of the TI

By BRUCE HARRISON
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One of the precious "free" gifts included in our beloved TI is the sound chip. This little jewel, with its three main voices and its "noise" generator, makes a wide variety of sound effects possible without any additional hardware required. Only two PC manufacturers have seen fit to include such capability: IBM in the now orphaned PCjr, and Tandy in their 1000 series of PCs. Both of those chose to use the exact same TI chip that's in the 99/4A.

On the TI, one can make some very good sounds, and of course even music, from BASIC or Extended BASIC. Even though the sound is made in durations of one-sixtieth of a second, some really good music has been produced that way. (On the above-mentioned PCs, sounds in BASIC are timed in increments of 1/18.2 second, making decent music virtually impossible.)

In the Assembly realm, we have considerably more flexibility available than in the BASIC and XB realms. Here, we can choose not only what sounds we want, but can choose to time their durations in many ways, and even produce simulated "instrument" effects, like harp-sichord, flute, snare drum, and so on. The techniques we've used to produce instrument effects could fill more than one installment of this series by themselves, and we'll get to that one day, but for today we'll concentrate

(See Page 12)

Sidebar

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* TWO METHODS FOR USING SOUND LIST DATA TO PRODUCE SOUND EFFECTS
* FIRST CAN ALLOW SOUNDS TO PROCESS IN BACKGROUND WHILE THE PROGRAM
* PERFORMS OTHER ACTIONS
* CODE BY B. HARRISON
* PUBLIC DOMAIN
*
* THE FOLLOWING HAPPENS AT THE BEGINNING OF THE PROGRAM, TO PRELOAD THE
* SOUND LISTS INTO THE VDP RAM AREAS
*
LI   R0,>2050      POINT AT FIRST LIST AREA
LI   R1,SNDDAT     BEGINNING OF FIRST SOUND LIST
LI   R2,ENDSND-SNDDAT LENGTH OF FIRST SOUND LIST
BLWP @VMBW        WRITE THAT TO VDP RAM
A    R2,R1         ADD LENGTH OF FIRST LIST
LI   R0,>2100      POINT TO VDP RAM AREA FOR SECOND LIST
LI   R2,LSOUND-ENDSND LOAD R2 WITH LENGTH OF SECOND LIST
BLWP @VMBW        WRITE THAT
A    R2,R1         ADD LENGTH OF SECOND LIST
LI   R0,>2200      POINT AT ADDRESS FOR THIRD LIST
LI   R2,BLANK-LSOUND LENGTH OF THIRD LIST
BLWP @VMBW        WRITE THAT TO VDP RAM
* PROGRAM CONTINUES
*
* FOLLOWING CODE SECTION STARTS THE "IN FLIGHT" SOUND EFFECT FOR THE
* PATRIOT
* WHEN THE PATRIOT MISSILE IS LAUNCHED
*
INFLT LI R10,>2200  POINT AT "IN FLIGHT" SOUND LIST
      MOV R10,@>83CC MOVE THAT ADDRESS TO >83CC
      SOCB @ONE,@>83FD TURN ON
      MOVB @ONE,@>83CE VDP SOUND PROCESSING
COINC LIM1 2       ALLOW INTERRUPTS
      LIM1 0         THEN SHUT THEM OFF
* A LOOP HERE LOOKS FOR SPRITE COINCIDENCE
* AND FOR THE SCUD TO REACH BOTTOM OF SCREEN
* DEPENDING WHICH HAPPENS, PROGRAM JUMPS TO EITHER CRASH OR CRASH2
*
CRASH
*
```

REGENA ON BASIC—

(Continued from Page 10)

```
KS ALONE": "FOR";TA;"HOURS, T
HEN THEY" !074
2400 PRINT "WORK TOGETHER, H
OW LONG MUSTTHEY WORK TOGETH
ER TO": "FINISH THE JOB?": :!
031
2410 INPUT "HOURS: ":ANS1 !0
19
2420 IF ANS1=TT THEN 2450 !0
17
2430 PRINT : "THE CORRECT ANS
WER IS";TT:"HOURS." !137
2440 GOTO 2460 !244
2450 PRINT : "CORRECT." !096
2460 GOSUB 420 !245
2470 RETURN !136
2480 REM TICKETS !241
```

```
2540 SUM=F*TF+B*TB !178
2550 MONEY=SUM*100 !090
2560 GOSUB 470 !039
2570 PRINT "RESERVED TICKETS
FOR A SHOW COST $";F;"AND G
ENERAL" !243
2580 PRINT "ADMISSION TICKET
S COST $";B !236
2590 PRINT "IF";TT;"TICKETS
WERE SOLD": "FOR ";MONEY$;"
HOW MANY OF" !075
2600 PRINT "EACH KIND OF TIC
KET WAS": "SOLD?": :!209
2610 INPUT "RESERVED ":ANS1
!203
2620 INPUT "GEN. ADM. ":ANS2
!116
2630 IF (ANS1=TF)+(ANS2=TB)=
```

```
2490 F=15+R(10)!223
2500 B=8+R5 !073
2510 TT=100+R(100)!158
2520 TF=50+R(50)!054
2530 TB=TT-TF !088
-2 THEN 2680 !104
2640 PRINT : "THE CORRECT ANS
WER IS" !236
2650 PRINT TF;"RESERVED" !02
5
2660 PRINT TB;"GENERAL ADMIS
SION" !131
2670 GOTO 2690 !219
2680 PRINT : "CORRECT." !096
2690 GOSUB 420 !245
2700 RETURN !136
2710 CALL CLEAR !209
2720 END !139
```

THE ART OF ASSEMBLY—

(Continued from Page 11)

on simpler uses for the "sound chip."

THE SOUND LIST METHOD

Let's start with a rather simple application, in which we want a noise or a series of musical notes to occur while something else is happening. TI provided an automatic sound processing capability in the VDP so that one could "have his cake and eat it too". The VDP can be given a list of sounds to produce, and told to start making those, then the computer can go on with other business, looking for keystrokes from the keyboard, or looking for joystick inputs, sprite coincidences, and so on, while the sound list executes "on background". That's certainly a handy feature. It does require the instructions LIM1 2 and LIM1 0 to let the VDP continue its sound processing on an interrupt basis, but that's a small price to pay for the capabilities that it gives us.

Sound lists may be placed in VDP Ram at the beginning of a program, and then activated when needed, without needing to be re-loaded.

The first part of today's sidebar shows one such application, in which the sound lists for three different effects are pre-loaded early in a program and then activated when the program needs them. These particular lists are from the game Scud Busters. In that case, the "in flight" sound can be interrupted at any time by one of the "explosions" depending on what happens to the sprites that are in motion on the screen. The interruption process is very simple. Note that we need not stop the "in flight" effect, but just put the right addresses in place to start the explosion, and processing of the "in flight" effect stops. This will not always be the case, depending which generators were being used by the first sound being processed. There are a couple of "safe" ways of dealing with that possibility. Perhaps the easiest is to put a "shut up" sound at the beginning of each sound list, with a duration of 1. That will shut down all four of the generators for one-sixtieth of a second before the new sound starts. You can also put "silence" bytes in your first "note" for the new sound to shut off any generators not used by that sound effect, and that will make an "instant" interruption of the previous sound effect. That's the method used in our sidebar source code.

The explosion sound effects are allowed to run for their full duration in all cases, and serve thereby as timers to allow the user time to see the explosion screen display. We mentioned back in number 18 the potential use of sound lists as timers, and here is a practical example of that use.

Each sound list should end with a "zero duration" sound so that it will end without leaving a generator "hanging" when the intended sound ends. You'll notice that each of the sound lists shown ends that way. The content part of a sound list is outlined well enough in the

(See Page 13)

```
* CODE THAT PLACES A GROUND BURST EXPLOSION EFFECT ON SCREEN GOES HERE
*
    LI    R10,>2100    POINT AT VDP ADDRESS FOR "GROUND BURST" EFFECT
    JMP   CRASH1      THEN JUMP
CRASH2
*
* CODE THAT MAKES AN AIR BURST ON SCREEN GOES HERE
*
    LI    R10,>2050    POINT AT VDP ADDRESS FOR "AIR BURST" EFFECT
CRASH1 LIM1 0        STOP INTERRUPTS FOR NOW
    MOV   R10,@>83CC   PLACE SOUND LIST ADDRESS AT >83CC
    SOCB @ONE,@>83FD   THEN START
    MOVB @ONE,@>83CE   VDP SOUND PROCESSING
    LIM1 2            PERMIT INTERRUPTS
SNDLOP MOVB @>83CE,R10 TIMING LOOP FOR THE SOUND
    JNE   SNDLOP      CONTINUES LOOPING UNTIL SOUND LIST HAS FINISHED
    LIM1 0            DISCONTINUE INTERRUPTS
* PROGRAM CONTINUES WHEN EXPLOSION SOUND ENDS
*
* SECOND METHOD, USES "SOUND LIST" IN MAIN MEMORY, DOES NOT REQUIRE USE OF
* VDP RAM FOR THE SOUND LIST
*
SOUND EQU >8400      DEFINE THE SOUND CHIP ADDRESS
*
METH2
    LI    R9,SNDDAT   POINT AT "SOUND LIST" IN RAM
NXTNOT
    MOVB *R9+,R4      GET THE "COUNT" BYTE INTO R4
    SRL   R4,8        RIGHT JUSTIFY IN R4
    JEQ   SNDEX       IF ZERO, GET OUT OF PROCESS
MOVSN
    MOVB *R9+,@SOUND  MOVE A SOUND DEFINING BYTE TO THE CHIP
    DEC   R4          DECREMENT COUNT OF BYTES IN THIS NOTE
    JNE   MOVSN       IF NOT ZERO, REPEAT PROCESS
    MOVB *R9+,R4      ELSE GET THE "DURATION" BYTE INTO R4
    SRL   R4,8        RIGHT JUSTIFY IN R4
    JEQ   SNDEX       IF ZERO, THIS IS END OF SOUND LIST, SO GET OUT
    CLR   @>8378      ELSE CLEAR THE VDP INTERRUPT COUNTER
SNDLOP
    LIM1 2            ALLOW INTERRUPTS BRIEFLY
    LIM1 0            THEN SHUT THEM OFF
    C     R4,@>8378   COMPARE R4 TO VDP INTERRUPT COUNT
    JGT   SNDLOP      IF R4 IS GREATER, WE'RE NOT FINISHED WITH THIS
NOTE
    JMP   NXTNOT      ELSE WE ARE FINISHED, GO BACK FOR NEXT NOTE
SNDEX
* PROGRAM CONTINUES HERE
*
* IN DATA SECTION, THREE SOUND LISTS
* FIRST MAKES "AIR BURST", SECOND "GROUND BURST", THIRD IS "IN FLIGHT"
*
SNDDAT
    BYTE 5,>9F,>BF,>DF,>E5,>F2,3
    BYTE 2,>E5,>F0,9
    BYTE 2,>E5,>F2,8
    BYTE 2,>E5,>F4,6
    BYTE 2,>E5,>F6,4
    BYTE 2,>E5,>F8,2
    BYTE 2,>E5,>FA,1
    BYTE 1,>FF,0
ENDSND
    BYTE 7,>9F,>BF,>C2,>0E,>DF,>E3,>F0,3
    BYTE 2,>E5,>F0,15
    BYTE 2,>E3,>F2,3
    BYTE 2,>E5,>F2,12
    BYTE 2,>E3,>F4,2
    BYTE 2,>E5,>F4,10
    BYTE 2,>E3,>F6,2
    BYTE 2,>E5,>F6,8
    BYTE 2,>E3,>F8,1
    BYTE 2,>E5,>FA,6
    BYTE 4,>FF,>DF,>BF,>9F,0
LSOUND BYTE 5,>E4,>F0,>9F,>BF,>DF,12
    BYTE 1,>F1,10
    BYTE 1,>F3,8
    BYTE 1,>F5,7
    BYTE 1,>F8,6
    BYTE 1,>FC,5
    BYTE 1,>FF,0
BLANK DATA 0      DATA SECTION CONTINUES HERE
```

THE ART OF ASSEMBLY—

(Continued from Page 12)

E/A book itself, but you will see some tricks used in our implementation that are not covered in the book. The list beginning at ENDSND, for example, includes a note for generator 3 in the bytes >C2 and >0E, but then sets that generator's volume at silence by >DF. It then sets the noise generator to produce a noise subharmonic of the generator 3 note at maximum volume by sending >E3 and >F0 bytes. During the rest of the list, it alternates the noise generator's response by sending bytes of >F5 and >F3 in successive "notes". Also, the volume of the noise is decayed by changing the noise generator's volume from >F0 down to >FA before the final line in the list, at which all generators are set to silence. This alternation of the "note" and decaying of volume creates a kind of "pulsing" explosion sound with two distinct noises heard while the volume decays. Of course this particular list was the result of a good deal of experimenting to get just the effect we wanted. The byte >E3 is equivalent to BASIC's -4 sound, while the >E5 is equivalent to the BASIC -6 sound. Knowing that can let you use BASIC or XB to experiment with sounds before you try them in a sound list.

Of course if you're going to do that, you must also bear in mind the relationship between durations in BASIC and Assembly sound lists. In this case, the BASIC and Extended BASIC books have lied to you. Those books indicate that you can specify sound durations in milliseconds. This is just not true. Any number of milliseconds you indicate up to and including 16 will produce exactly the same duration of sound, namely one-sixtieth of a second. Indicating 17 will get you two sixtieths, as will 18, 19, 25, or 30 milliseconds. The crossover point from one actual duration to the next is every 16.666... (sixes all the way across the page if you like) milliseconds. We'll leave the math to you, but you can successfully experiment with your sounds in BASIC or XB as long as you remember that the real durations are in one-sixtieths of a second, and translate into "milliseconds" for BASIC. We never said this would be easy!

As it happens, the examples we've shown all involve use of the noise generator, not the musical voices of generators 1 through 3, but that shouldn't hinder your efforts if you understand the principles involved.

All of the above presupposes that you have an area of the VDP Ram memory that can remain available for the duration of your program. In this case, we simply assigned small blocks of VDP RAM at addresses >2050, >2100, and >2200 for our sound lists, then left those areas untouched during execution of the program. If our program had disturbed those areas, we would have had to reload our sound lists each time we wanted to use them. In most cases you'll find any address above >1000 will do, so long as you don't go beyond >37D7.

There will be cases where the sound list method won't do the job, and for that reason we'll now show at least one more method for "doing sound". Let's start with the assumption that you are using VDP Ram for some purpose that will preclude setting any of it aside for sound lists. You can still use them, but in a different manner. Unfortunately, these methods will not permit a true "background" process for sound, but will require timing loops of

some kind in your own code.

DIRECT TO THE GENERATOR

You can send sound defining bytes directly to the sound chip at address >8400, then use your own method to time the durations. For openers, we'll consider a method that uses the exact same sound list as shown in the previous example, but will not load the sound list into VDP Ram. This method will still time the sounds in one-sixtieth of a second increments using the VDP Interrupt timer, but will do that timing in the "foreground" program.

As shown in the sidebar starting at label METH2, you'll need a pointer set to the beginning of the sound list. We've used R9 here, but any register that's handy will do. The first byte in the sound list is the number of bytes that constitute the "note" being sent. We take that first byte into R4 and then use R4 as a counter. Each of "count" bytes is then sent to the sound chip at address >8400. The byte immediately after the last "generator" byte is the duration, and here we've put that byte in R4, then right justified this number in that register. If that number is zero, we are at the end of the sound list, so we simply jump out of the sound section of code. Otherwise, we clear the VDP Interrupt counter, then simply start looping with a LIM1 2 and LIM1 0, and a comparison between R4 and the VDP Interrupt counter. As long as R4 is greater than the value in the counter, we keep repeating the loop. Once the counter gets equal to or more than R4, the sound "note" is finished, so we jump back to process the next "note" in the list. We have used the expression "note" here to mean a set of instructions passed to the sound chip, which includes both note values for the generators and volume values for those generators. As we've mentioned before in this series, the duration here for any one note may not exceed 255, or >FF, which makes a note last 4.25 seconds.

There is one trick required to use the direct method. We'll pass that along without knowing why it's so: At the very beginning of the program, before loading your own workspace, you must execute a MOV R11,@ANYWRD instruction. ANYWRD here means just that. You can move R11 to >8300, for example, or to some word location in your own data section. You won't need it again, but if you don't execute that MOV instruction before loading your own workspace, the direct method will not work properly. Please don't ask why this is so. It just is!

Since this method uses the VDP Interrupt counter to time the durations of the notes, the same duration values that were used when we placed the sound list in VDP Ram will work. As before, the last "note" must have a duration of zero to signal that we're at the end of a sound list. We recommend a "note" like this be the last in the list:

```
BYTE 4,>9F,>BF,>DF,>FF0
```

That will "shut down" all four generators in the chip by setting each to a silent volume level.

The code shown for this method can also be set up as a subroutine starting at label NXTNOT, with an RT instruction at label SNDEX. Then one could play different sound lists by:

```
LI    R9,SNDLST
BL    @NXTNOT
```

(See Page 14)

Test your battle skills with TI-Sweeper

Three levels challenge any players

Lucie Dorais, of the Ottawa TI99/4A User Group, writes a column called Fast Extended BASIC for the group's newsletter. This article appeared in the group's September 1992 issue.

This month's program is the Microsoft Windows game Minesweeper, by John Donner and Curt Johnson. It has proved so popular that it is included in V3.1 of Windows. The gameboard is a field of empty white squares. You must correctly flag the mines as you uncover each square; if you uncover a mine, the game is over.

When you uncover a safe spot, the square will turn to pale blue and Tex will indicate the number of mines surrounding it in a 3x3 area, from 0 to 8. That 3x3 area includes the borders if you are adjacent to them. (Hint: always think "3x3" when playing.) If the surrounding number of mines is zero, Tex will safely uncover all uncovered squares in the 3x3 area around it, unless you put a wrong flag there. (The Windows version instantly cleans all the way to the squares which contain a number higher than zero, but I don't like that feature. Sweeping a minefield must be done cautiously. And it would have been too

complicated to program, and too slow to run!)

When you think you have safely located a square hiding a mine, flat it with the "F" key. A yellow flag appears in place of the white square. If you are not sure, flag it again. The flag will change to a question mark in a white square. From now on, that question mark will act like a white square, ie. you may uncover it or re-flag it. (press "F" twice to reflag — once to get an empty white square, once more to get a flag. The number of flags you may use is equal to the number of mines still hidden.

The game ends when you have uncovered all the squares (at that point they will be all pale blue or flagged in yellow), unless a mine has exploded in your face long before! In both instances, all mines will then be revealed and your wrong flags marked. There are three levels of play: Beginner (the field has 64 squares on an 8x8 grid with 10 mines); Intermediate (144 squares on a 12x12 grid with 25 mines); and Professional (256 squares on a 16x16 grid with 40 mines).

There is a small error in line 280 following 16X16=256. Instead of zero, the num-

ber should be 40.—Ed.

TI-SWEEPER

```
100 ! ***** TI-SWEEPER *****
A MS/Windows game adapted by
  Lucie Dorais / Ottawa UG /
  July-Aug. 1992 !212
110 !!131
120 CM=113 :: CE=112 :: FM=1
22 :: FE=123 :: QM=114 :: QE
=115 :: RANDOMIZE :: CALL CL
EAR :: ON WARNING NEXT :: CA
LL SCREEN(10)!179
130 CP$="FF01010101010101" :
: MP$="FF0155397D7D3901" ::
FP$="FF01393D39212101" :: WF
$="FF433D3D39256381" :: QP$=
"FF19250911011101" !151
140 GOTO 160 :: A,A$,BC,BL,B
R,C,CTR,FLAGS,F,FND,K,LV,NM,
NS,P,PK,R,S,UNC :: CALL KEY
:: CALL SOUND !242
150 CALL CHAR :: CALL VCHAR
:: CALL COLOR :: CALL SPRITE
:: CALL DELSPRITE :: CALL L
OCATE :: CALL PATTERN :: !P-
!229
```

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THE ART OF ASSEMBLY—

(Continued from Page 13)

The subroutine will modify the values in R9 and R4, but will leave all others alone.

MORE EXOTIC METHODS

There are other ways to do the sounds, and once you've crossed the bridge into sending bytes directly to the sound chip, you can do things that were impossible in the "sound list" method. We'll just touch on those today.

First, let's suppose that one-sixtieth second is too long a duration for you. You want a succession of very swift notes to play, like the strumming of a guitar or lute, or you want some noise like automatic weapons firing in rapid succession. These cases are where the real power of the "direct" method comes into play. Instead of timing durations with the VDP Interrupt timer, you can construct a simple delay loop of your own, and use a word value instead of a byte to do the timing. This way, you can make incredibly short sounds and incredibly long ones without strain, since the "duration" can run from 1 through 65,535, and the amount of time each loop takes can be tailored to your own needs by inserting

"time wasters" into the loop. One of our favorites is to do a DIV operation within the timing loop. That wastes time very nicely, and can be used for other purposes related to the sound you're creating. The SRC instruction can also be used for this purpose, and it will serve well.

We of course have used this third method for our "Assembly Music" products, and have been able to fine tune the response of the generators to simulate musical instruments of various kinds. We made changes to the volumes and notes on the generators while a "note" was playing. Thus an instrument like a piano or harpsichord could be simulated by using an exponential decay in volume during each note played. Barry Boone has carried that concept even farther with his SOUND F/X product, to produce spectacular effects and even spoken words in a recognizable voice without a speech synthesizer.

Next month we'll go on with this subject, revealing some of our "trade secrets" used in the Assembly Music that we are known for. That will include at least one of our most advanced "instrument" subroutines.

TI-SWEEPER

(Continued from Page 14)

```

160 CALL CHAR(64,"0000183C3C
18",CE,CP$,CM,CP$,114,QP$,11
5,QP$,120,MP$)! caches, mine
s !142
170 CALL CHAR(FM,FP$,FE,FP$,
128,"0000383C382020")! flags
!192
180 A$=RPT$( "F",14):: CALL C
HAR(107,A$&"FF",129,"FF81818
1818181FF",130,A$,135,"FF010
10101010101")! border, curso
r, zero !166
190 CALL CHAR(136,"FF0109190
9091D01FF01192509113D01FF013
90519053901FF010919293D0901"
)! digits 1-4 !123
200 CALL CHAR(140,"FF0139213
9053901FF01192139251901FF013
D0509112101FF011925192519251
901")! digits 5-8 !040
210 CALL COLOR(9,2,16,10,13,
1,11,2,16,12,2,11,13,2,8,14,
2,8)!187
220 ! === instructions / cho
ose level === !174
230 DISPLAY AT(1,9):"TI-SWEE
PER": "YOUR TASK IS TO SWEE
P kkkkkk":"A MINEFIELD AND F
LAG k211k":"ALL SPOTS THAT
MIGHT k121k" !230
240 DISPLAY AT(6,1):"HIDE A
MINE.":TAB(23);"k 122k":TAB(
23);"k 11k": "<SPACE> ACTIVAT
ES THE kkkkkk" !134
250 DISPLAY AT(9,1):"SWEEPER
; IF A MINE IS":"HIDDEN UNDE
R THAT SPOT,":"IT EXPLODES (
GAME OVER)." !052
260 DISPLAY AT(12,1):"IF THE
SPOT IS SAFE, IT WILL":"SHO
W THE NUMBER OF MINES":"SURR
OUNDING IT (3X3 AREA).":"FLA
G IS A 3-TOGGLE FUNCTION." !
193
270 DISPLAY AT(17,1):"":"LEV
EL FIELD MINES";"
-----"
:" 1 BEGINNER 8X 8= 64 1
" !071
280 DISPLAY AT(21,1):" 2 INT
ERM. 12X12=144 25":" 3 P
RO 16X16=256 0": "
CHOOSE LEVEL:" !119
290 ACCEPT AT(24,21)SIZE(-1)
VALIDATE("123"):A$ :: LV=VAL
(A$):: NM=15*LV-5 !200
300 CALL CLEAR :: BR=8-2*LV
:: BC=BR+7 :: NS=4+4*LV !227
310 !===== draw scree
n / hide the mines =====
=== !111
320 CALL HCHAR(BR-1,BC-1,107
,NS+2):: CALL VCHAR(BR,BC-1,
107,NS):: CALL VCHAR(BR,BC+N
S,107,NS):: CALL HCHAR(BR+NS
,BC-1,107,NS+2)!154
330 FOR R=BR TO BR+NS-1 :: C
ALL HCHAR(R,BC,112,NS):: NEX
T R !172
340 CTR,FND,UNC,BL=0 :: FLAG
S=NM :: DISPLAY AT(20,1):"":
" HIDING THE";NM;"MINES...
": "":: CALL CHAR(CM,CP$,
QM,QP$,FM,FP$,FE,FP$)!039
350 R=INT(RND*NS)+BR :: C=IN
T(RND*NS)+BC :: CALL GCHAR(R
,C,PK):: IF PK=CM THEN 350 !
055
360 CALL SOUND(-30,-2,0):: C
ALL HCHAR(R,C,CM):: CTR=CTR+
1 :: IF CTR<NM THEN 350 !163
370 R=BR :: C=BC :: CALL SPR
ITE(#1,129,5,8*(R-1)+1,8*(C-
1)+1,#2,130,7,195,1)!036
380 DISPLAY AT(20,1):" EXSD
SWEEP": "<SPACE> UNCOVER": "
F FLAG MINE": " G
GIVE UP" :: CALL FL(FLAGS)!0
89
390 !===== evaluate
at position !128
400 IF UNC=NS*NS THEN 640 !0
40
410 CALL KEY(0,K,S):: IF S=0
THEN 400 ELSE P=POS("EXSDG"
,CHR$(K),1):: ON P+1 GOTO 47
0,420,430,440,450,640 ! chec
k moves !214
420 R=R-1 :: IF R=BR-1 THEN
R=BR :: GOTO 460 ELSE 460 !1
41
430 R=R+1 :: IF R=BR+NS THEN
R=R-1 :: GOTO 460 ELSE 460
!172
440 C=C-1 :: IF C=BC-1 THEN
C=BC :: GOTO 460 ELSE 460 !0
51
450 C=C+1 :: IF C=BC+NS THEN
C=C-1 !157
460 CALL SOUND(-5,1000,0)::
CALL LOCATE(#1,8*(R-1)+1,8*(
C-1)+1):: GOTO 400 !194
470 CALL GCHAR(R,C,PK):: IF
(PK>134 AND PK<144)THEN CALL
SOUND(50,110,0):: GOTO 400
! don't flag/uncover blue sq
uares !047
480 IF K=32 THEN 550 ELSE IF
K<>70 THEN 400 !103
490 IF PK=FM OR PK=FE THEN 5
20 :: IF FLAGS=0 THEN CALL S
OUND(50,-2,0):: GOTO 400 !12
0
500 IF PK=QM OR PK=QE THEN A
,F=0 :: IF PK=QM THEN K=CM :
: GOTO 530 ELSE K=CE :: GOTO
530 ! question mark back to
white square !115
510 A=1 :: IF PK=CM THEN K=F
M :: F=1 :: GOTO 530 ELSE K=
FE :: F=0 :: GOTO 530 ! put
flag !200
520 A=-1 :: IF PK=FM THEN K=
QM :: F=-1 ELSE K=QE :: F=0
! remove flag with ? !011
530 CALL HCHAR(R,C,K):: UNC=
UNC+A :: FLAGS=FLAGS-A :: FN
D=FND+F :: CALL FL(FLAGS)::
GOTO 400 !092
540 ! == uncover with <space
> == !091
550 IF PK=FE OR PK=FM THEN C
ALL SOUND(50,110,0):: GOTO 4
00 ! cannot uncover a flat !
251
560 IF PK=CM OR PK=QM THEN 6
10 ! uncover a hidden mine !
118
570 CTR=0 :: CALL SWP(R,C,CT
R,UNC):: IF CTR>0 THEN 400 !
032
580 CALL PATTERN(#1,83):: FO
R K=R-1 TO R+1 :: FOR S=C-1
TO C+1 :: CALL SWP(K,S,0,UNC
)!109
590 NEXT S :: NEXT K :: CALL
PATTERN(#1,129):: GOTO 400
!056
600 !===== blast! =====
===== !251
610 BL=1 :: CALL LOCATE(#2,8

```

(See Page 16)

Horizon SCSI card expected this month

Although the initial deadline for the Horizon SCSI card has been missed, Bud Mills says that a working SCSI card will be available by the end of February.

The card controls up to eight SCSI (scuzzy) devices. SCSI devices include floppy and hard drives, scanners, CD ROMs and other output devices. However, to use the SCSI interface card with a SCSI device, software drivers are required. So not all SCSI devices will work with the SCSI card until drivers are available.

At this stage, Mills said, the SCSI card will control floppy and hard disk drives with the present EPROM and DSRs (Device Service Routines). A new, upgraded EPROM with additional hardware support is expected to be available by July, Mills said.

All low-level routines reside in the EPROM. And hardware drivers can be loaded into part of a 32K static RAM chip, a part of which is used as a buffer.

Previous purchasers of the SCSI card as well as future buyers will receive a list of compatible hardware to help them make buying decisions. Among hard drives that are not currently compatible, for example, Mills mentions Quantum.

It should also be noted that the card supports only SCSI devices, so floppy drives

and MFM hard disk drives currently used with the TI will be incompatible. He notes that prices for a used, 20 megabyte SCSI hard drive start at about \$100.

The Horizon SCSI controller card is compatible with the newer SCSI-2 standard. This makes it downwardly compati-

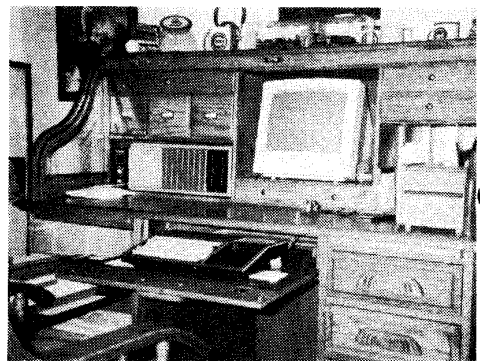
ble with SCSI-1 devices, Mills said.

The SCSI controller is priced at \$170 from Bud Mills Services, 166 Dartmouth Dr., Toledo, OH 43614; 419-395-5946 voice, 419-385-7484 BBS. Payment may be made with check, money order or Visa/Mastercard.

SYSTEM OF THE MONTH

Bryant Krause, of Mira Loma, California, has expanded his TI system to include numerous upgrades that optimize it for word processing and record keeping. The system includes a TI console with TIM 80-column card, with the firehose interface cable eliminated; a Magnavox 14-inch ICM135 color monitor; a PEB with TI RS232 card containing the John Guion chip upgrade; a P-GRAM with clock; Myarc 512K RAM card; Rave 99 speech synthesizer adapter card; TI disk controller and dual DSDD floppy disk drives. Outside of the PEB, he has a Consolink 256K printer buffer, Epson MX80 printer with Dresselhaus Dot-Perfect upgrade, Star 2400 baud intelligent modem and a Horizon mouse. Although he didn't include the rolltop desk as part of his system, it provides an attractive and functional home for his system. Bryant says his only problem is keeping his cat away from the mouse.

Want to share your system with other readers. Send a description of your system with photo to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.



TI-SWEEPER

(Continued from Page 15)

```
* (R-1)+2,8*(C-1)+1):: CALL P
ATTEN(#1,120)!029
620 FOR P=1 TO 10 :: CALL SO
UND(60,-7,P,120,P,131,P):: C
ALL COLOR(#1,2):: CALL COLOR
(#1,11):: NEXT P ! explosion
!059
630 ! ===== end =====
== !161
640 IF FND<NM THEN 660 !197
650 FOR P=1400 TO 3000 STEP
400 :: CALL SOUND(50,P,0)::
NEXT P ! got all !234
660 CALL CHAR(CM,MP$,QM,MP$,
FM,MP$,FE,WF$)! reveal all mi
nes + wrong flags !133
670 DISPLAY AT(20,1):USING "
x ## CORRECT FLAGS":FND !125
```

```
680 DISPLAY AT(21,1):USING "
q ## MINES STILL HIDDEN":NM-
FND-BL !122
690 DISPLAY AT(22,1):":RPT$
("k",28):"A)GAIN C)H. LEVE
L Q)UIT" !057
700 CALL KEY(0,K,S):: IF S=0
THEN 700 ELSE P=POS("ACQ",C
HR$(K),1):: IF P=0 THEN 700
ELSE IF P=3 THEN END !242
710 CALL DELSPRITE(ALL):: IF
P=1 THEN 330 ELSE 270 !158
720 !P+ ===== user-def su
bs ===== !099
730 SUB FL(F):: X=F :: R=23
!079
740 IF X>=10 THEN CALL HCHAR
(R,21,128,10):: X=X-10 :: R=
R-1 :: GOTO 740 !207
```

```
750 CALL HCHAR(R,21,128,X)::
CALL HCHAR(R,21+X,32):: SUB
END ! display remaining flag
s !073
760 SUB SWP(R,C,CTR,UNC):: C
ALL GCHAR(R,C,PK):: IF (PK<>
112 AND PK<>115)THEN SUBEXIT
! sweep around empty square
or ? !238
770 FOR X=R-1 TO R+1 :: FOR
Y=C-1 TO C+1 :: CALL GCHAR(X
,Y,PK):: IF PK=113 OR PK=114
OR PK=122 THEN CTR=CTR+1 !
count hidden/flagged mines !
223
780 NEXT Y :: NEXT X :: CALL
HCHAR(R,C,CTR+135):: UNC=UN
C+1 :: SUBEND !024
```


TEX+COMP

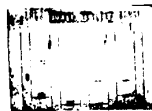
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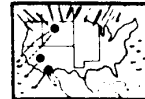
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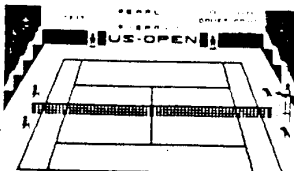


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1992 MICROpendium Index

Covering January through June 1992

The following index of MICROpendium, written in Extended BASIC, covers January through June of 1992. Like the others before it, it is written by Elton Schooling. The index for the second half of 1992 will be published next month.

The program uses an assembly language routine called SORT for sorting. Although this is not included here, it is included with the February and March 1993 monthly disks.

The entire MICROpendium Index, from February 1984 through December 1992, is available on two disks, and includes many enhancements provided by readers over the years. The price is \$6, including postage. It can be ordered from MICROpendium Index, P.O. Box 1343, Round Rock, TX 78680.

IND92A-A/L

10 REM INDEX92A MICROpendium
INDEX for 1992, Jan to Jun,
Publisher John Koloen, edit
or Laura Burns. !132
20 REM Compiled by Elton Sch
ooling, 4014 57th St., Sacra
mento, CA 95820 !173
30 REM Sort routine by David
Romer and John Clulow. Ob-
tained from Boston Computer
Soc., TI994/A User Group. Fo
r use with printer or with !
254
32 REM screen display.
"Sort" program must be on sa
me disk with index. !22635 R
EM Because of many entries t
he '92 index is divided into
'92A, Jan. to June, and '92
B, July to Dec. !107
40 REM For your printer you
may need to change line 160.
!202
50 REM For longer dwell time
on screen increase the DELA
Y number in line 330. !210
52 CALL INIT !157
54 CALL CLEAR !209
56 CALL LOAD("DSK1.SORT") !07
9
60 OPTION BASE 1 !137

70 CALL CLEAR !209
80 DIM N\$(116)!204
90 INPUT "OUTPUT TO PRINTER?
(Y/N) ":P\$!247
100 CALL CLEAR !209
110 PRINT "WORKING" !139
120 FOR I=1 TO 116 :: READ N
\$(I):: NEXT I !067
130 CALL LINK("SORT",N\$(),11
6)!191
140 CALL CLEAR !209
150 IF P\$="Y" THEN 160 ELSE
290 !093
160 OPEN #1:"PIO" !253
170 PRINT #1:TAB(24);"MICROP
endum INDEX, 1992A, Jan to
Jun" !156
180 PRINT #1: : : : !103
190 FOR J=1 TO 116 :: IF J=1
05 THEN 200 ELSE 220 !120
200 PRINT #1: : : : : PRINT
#1:TAB(35);"PAGE 30" :: PRI
NT #1: : : : : : : :
GOTO 220 !194
210 PRINT #1: : : : : : PRI
NT #1:TAB(31);"PAGE 31, INDE
X '92A" :: PRINT #1: : : : :
: : : : : !138
220 IF J/2=INT(J/2) THEN 240
!249
230 PRINT #1:N\$(J):: GOTO 2
50 !240
240 PRINT #1:TAB(40);N\$(J)!1
88
250 NEXT J !224
280 GOTO 360 !184
290 CALL CLEAR !209
300 CALL SOUND(500,110,0,131
,0,196,0)!005
310 PRINT TAB(7);"MICROPendi
um INDEX, 1992A" :: PRINT :
: !060
320 PRINT "DATE AND PAGE NO.
ARE LISTED TOGETHER. JAN 85
p.16 BECOMES 1/85/16." : : :
!005
330 FOR J=1 TO 116 :: PRINT
N\$(J):: FOR DELAY=1 TO 220 :
: NEXT DELAY :: NEXT J !023
340 PRINT : : !006
350 PRINT "DATE AND PAGE NO.

ARE LISTED TOGETHER. JAN 85
p.16 BECOMES 1/85/16." :: G
OTO 390 !062
360 PRINT #1: : : !178
370 PRINT #1:"DATE AND PAGE
NO. ARE LISTED TOGETHER. JAN
85 p.16 BECOMES 1/85/16." !
146
375 PRINT #1: : : : : : : :
: : : : : PRINT #1:TAB(23);"M
ICROpendium Index, 1992A, Pa
ge 31" !140
380 CLOSE #1 !151
390 END !139
400 DATA AUTOBOOT/DUMP CARTS
FEEDB 1/92/6,BAS LEARN GERM
AN 1/92/9,XBAS CHECKBOOK AUT
OMATION 1/92/11 !231
410 DATA ART OF A/L FILE HAN
DLING TIPS 1/92/17,PROGRAMMA
BLE CALC TIGERCUB 1/92/19 !1
93
420 DATA CALC PROGRAMMABLE T
IGERCUB 1/92/19,FILE HANDLIN
G TIPS ART OF A/L 1/92/17,CH
ECKBOOK AUTOMATION XBAS 1/92
/11 !209
430 DATA DUMPIT CART TO DISK
REV 1/92/30,DISK OF PYRATES
REV 1/92/31,PYRATES REV 1/9
2/31,BRIDE OF DISK OF DINOSA
URS 1/92/31 !199
440 DATA DISK OF HORRORS REV
1/92/32,XBAS CARTRIDGE REPA
IR 1/92/34,CARTRIDGE REPAIR
XBAS 1/92/32,DINOSAURS REV 1
/92/31 !192
450 DATA RETIREMENT PLANNING
1/92/36,TI WRITER FILE UPKE
EP USNO 1/92/37,CRACKING THE
CODE USNO 1/92/38 !186
880 DATA 9640=GENEVE,GENEVE=
9640 !128
890 DATA VOLTS PROBLEMS AND
THE TI FEEDB 2/92/7,BAS BASK
ETBALL STATISTICS 2/92/9,XBA
S SUBINDEX TWO/TOKENS 2/92/1
3 !226
900 DATA TOKENS/SUBINDEX TWO
2/92/13,ART OF A/L MORE FIL
E TIPS 2/92/17,C99 FAST SORT

(See Page 19)

MICROPENDIUM INDEX 1992A—

(Continued from Page 18)

- 2/92/26 !124
 910 DATA TIWR FORMATTER REFORM 2/92/29, FORMATTER REFORM TIWR 2/92/29, SON OF AIRTAXI GAME REV 2/92/34 !096
 920 DATA GLOBAL WAR GAME REV 2/92/34, CERTIF99 COMPANION PLUS REV 2/92/35, CALCULATOR BUG FIX USNO 2/92/37 !242
 930 DATA JOYSTICK REWIRE USNO 2/92/37, MISSING LINK CHANGE USNO 2/92/37, CIRCLE DRAW NO TRIG USNO 2/92/38 !011
 940 DATA FUNLW CASE CHANGE USNO 2/92/38, BAS CHILD LETTER PRINTING 3/92/8, CHILD LETTER PRINTING BAS 3/92/8 !122
 950 DATA XBAS TI/IBM COMPARISONS 3/92/14, ART OF A/L CRASHES AND FIXES 3/92/21, STARBASE RAIDERS GAME REV 3/92/21 !141
 960 DATA CHECKERS GAME REV 3/92/26, JOYSTICKS REV 3/92/26, GRAFICS AND MUSIC REV 3/92/27, PAYROLL FILES/REPORTS REV 3/92/27 !106
 970 DATA ADVENTURE GAMES REV 3/92/27, PR EDITOR REV 3/92/28, BLOWER UNDER CONSOLE USNO 3/92/30, WINDOW MAKER CENTER S TEXT USNO 3/92/30 !145
 980 DATA CHECKBOOK FIX USNO 3/92/30, ASCII LISTER USNO 3/92/30, STAR PRINTER WIDTH FEE DB 4/92/7 !063
 990 DATA PRINTER WIDTH STAR FEEDB 4/92/7, BAS RAGLAN SWEATER 4/92/9, SWEATER RAGLAN BAS 4/92/9, XBAS TI/PC COMPARISONS 4/92/11 !053
 1000 DATA INDEX MICROPENDIUM 91 PART I 4/92/15, MICROPENDIUM 91 INDEX PART I 4/92/15, MY-BASIC VIDEO XOP6 PART I 4/92/22 !247
 1005 DATA VIDEO XOP6 MY-BASIC PART I 4/92/22 !215
 1010 DATA ART OF A/L STRUCTURING DATA 4/92/23, DATA STRUCTURING ART OF A/L 4/92/23, MY ART SLIDES/MYBASIC FILES REV 4/92/27 !007
 1020 DATA MYBASIC FILES/MYART SLIDES REV 4/92/27, CASINO GAMES REV 4/92/27, HARRISON WORD PROCESSOR REV 4/92/28 !147
 1030 DATA WORD PROCESSOR HARRISON REV 4/92/28, DISK DRIVE S 96TPI USNO 4/92/29, MYBASIC BREAK USNO 4/92/29 !221
 1040 DATA 96TPI DISK DRIVES USNO 4/92/29, BAS TRIGONOMETRIC FUNCTIONS 5/92/7 !1611050
 DATA TRIG FUNCTIONS BAS 5/92/7, ART OF A/L VDP RAM 5/92/8, VDP RAM ART OF A/L 5/92/8, XBAS UNBASHER 5/92/10 !060
 1060 DATA UNBASHER XBAS 5/92/10, MY-BASIC VIDEO XOP6 PART 2 5/92/13, DISASSEMBLER IN XBAS 5/92/14 !244
 1070 DATA INDEX MICROPENDIUM 91 PART II 5/92/21, MICROPENDIUM INDEX 91 PART II 5/92/21, LINEDITOR 9640 REV 5/92/23 !082
 1080 DATA OS/99 VERS 3 GRAM DEVICES REV 5/92/25, GRAM DEVICES OS/99 VERS 3 REV 5/92/25 !004
 1090 DATA EASY DATA HIGH SPEED SORT REV 5/92/26, SORT EASY DATA HIGH SPEED REV 5/92/26, GRADES REV 5/92/26 !102
 1100 DATA LPJ ART 5&11 REV 5/92/26, UTILITIES XBAS & RANDOM NO REV 5/92/27, MEMORY/LOGIC OP SUBS USNO 5/92/27, FUNLWEB 440 TIPS USNO 5/92/28 !189
 1110 DATA WINDOW MAKER UPDATE USNO 5/92/28, TIWR FORMATTER FUNLWEB USNO 5/92/29, FUNLWEB TIWR FORMATTER USNO 5/92/29 !101
 1120 DATA ARCHIVING PLATO BACKUPS USNO 5/92/29, PLATO BACKUPS ARCHIVING USNO 5/92/29, KWIKFONT COLORS USNO 5/92/29 !166
 1130 DATA BAS ENGLISH USAGE/GRAMMAR 6/92/7, XBAS TI & IBM BASIC COMPARISONS 6/92/10, ART OF A/L RANDOMLY SPEAKING 6/92/12 !104
 1140 DATA MY-BASIC VIDEO XOP6 PART 3 6/92/20, SINK-IT GAME 6/92/22, 9640 GAMES REV 6/92/25, KWIKDUMP REV 6/92/26 !031
 1150 DATA GGPM GRAPHICS LABEL MAKER REV 6/92/26, CREATURES FOR PAGE PRO 99 REV 6/92/27, CALENDAR REV 6/92/27 !232
 1160 DATA ARTIST CONVERSIONS REV 6/92/28, XBAS-A/L TRICK USNO 6/92/28, GENEVE HEAT SOLUTION USNO 6/92/29 !187
 1170 DATA TI WRITER TIP USNO 6/92/29, DIAL TONES USNO 6/92/30, LABEL MAKER GGPM REV 6/92/26 !173
 1180 DATA ENGLISH USAGE/GRAMMAR BAS 6/92/7, BASIC TI & IBM COMPARISONS 6/92/10, PAGE PRO 99 CREATURES REV 6/92/27 !067

Krych plans series of assembly books

James W. Krych has announced that he has begun his proposed "On Assembly" series of books, and has an outline of the first volume, a beginners guide to the assembly language.

He notes, "I have no doubt that some will find it boring. I do not intend to make it boring. I intend to work very hard on each chapter to bring up the mood of why certain things are the way they are. All I ask is that you hackers out there remember this, you had to start somewhere. Most people find assembly is different, with

many advantages."

Krych notes that he cannot give a date for completion. He is a full-time Coast Guardsman and directs research and development for Asgard Peripherals. He says he is still looking for assembly material and wishes to thank those who have helped him so far, particularly Bruce Harrison, Joe Delekto, Rich Gilbertson and Chris Bobbitt.

Persons with material to contribute to the book series may write Krych at 802 Barry #1208, Corpus Christi, TX 78403.

EXTENDED BASIC (plus)

JUMP-A-PEG returns

By BARRY TRAVER

©1993 B. Traver

JUMP-A-PEG returns! This month (and next) we'll be looking more at this classic solitaire game and looking at some related programming tips as well, thanks to contributions from Harry Wilhelm and Ollie Hebert (Harry this month and Ollie the next), both of whom (perhaps like you?) seem to enjoy both peg solitaire and TI Extended BASIC programming. Actually, for many of us, programming itself is a recreational game, so I think the combination is a natural one.

Harry Wilhelm is the author of The Missing Link, an excellent extension of TI XB available from Texaments (if you haven't ordered it yet, do it now — I don't think you'll be disappointed!). You do not need The Missing Link to make use of Harry's particular suggestions in this month's column, although a little knowledge of assembly is useful (if you — like an increasing number of TI XB programmers — like to use CALL LINKs to assembly routines from your TI XB programs).

MORE EFFICIENT CODE

With Harry's permission, I'm sharing with you excerpts from a recent letter I received from him, which comment on a neat trick applicable not only to JUMP-A-PEG but also to any other TI XB program that makes use of screen displays:

"I was looking at your JUMPEEG/S code and found that, although functional, your method of putting a list of text onto the screen was cumbersome and probably very hard to make changes to. After some thought I devised a nifty subroutine for putting text up onto the screen. I've included a listing of it along with this letter."

"The subroutine is smart enough to know the difference between screen addresses and text, and doesn't have to be told how long a string is. Each line of text can be printed in one or more places on the screen. You need to put RT at the end of each list. This is easy to remember and assembles the same as DATA >045B. Of course you should only use the label FLAG on one of the RT's."

"This three line program can be used to put a long list of text onto the screen:

```
BLWP @PRLIST
DATA TEXT
B @>006A
```

"Simple, eh? Hope this is of interest to you and that you keep your enthusiasm for the TI."

A handwritten P.S. on the letter declares that the "use of PRLIST will save you 486 bytes in JUMPEEG/S. I haven't checked that figure, but Harry is indeed right about my PEGJUMP/S assembly code as being functional but inefficient. One reason for that is (and this is something of which Harry was apparently unaware) that much of that code was written by GRAPHICOMP (a graphics BASIC compiler I wrote, published earlier in MICROpendium), which provides a lazy way to create assembly code for screen displays (even for someone who knows nothing about assembly language). The code produced by GRAPHICOMP does work, but it is certainly not compact. Harry's letter was, of course, definitely of interest to me, so much so that I obtained permission from him to share it with you as well, trusting that you too will find it both fascinating and beneficial.

Incidentally, in our phone conversation, Harry commented that you don't have to use RT (i.e., >045B) as your flag: you can use >1234 or what-

ever you prefer, as long as it is something distinctive. His code is indeed simple to use. All you need to do is provide the DATA for the screen addresses and the TEXT for what you want printed, and — as he says — his program is smart enough to tell the difference between the two. Even if you don't understand why his code works, all you have to modify is the DATA and TEXT to use the routine in your own TI XB programs to put up super-fast screen displays.

JUMP-A-PEG

I'll let you experiment further with Harry's code on your own. At this point we'll turn from programming to the JUMP-A-PEG game itself. I've only just now discovered (See Page 21)

PRLIST/S

```
* PRLIST/S
* by Harry Wilhelm

DEF START
BASIC EQU >006A
VSBW EQU >2020
START BLWP @PRLIST
DATA TEXT
B @BASIC
TEXT DATA >0000,>0022,>0044,>0066,>0088,>00AA,>00CC,>00EE
DATA >010E,>012C,>014A,>0168,>0186,>01A4,>01C2,>01E0
TEXT 'This is a test'
DATA >0222
TEXT 'More testing!'
DATA >0260
TEXT 'Passed the test if we got this far!'

FLAG RT
PRLIST DATA SUBWS,PRLISO
SUBWS BSS 32
PRLISO MOV *R14+,R3
PRLIS1 MOV R3,R4
PRLIS2 C *R4,@FLAG
JEQ BACK
JGT PRLIS3
INCT R4
JMP PRLIS2
PRLIS3 MOV R4,R5
MOV *R3+,R0
PRLIS4 MOV *R5+,R1
AI R1,>6000
JGT PRLIS5
BLWP @VSBW
INC R0
JMP PRLIS4
PRLIS5 C R3,R4
JLT PRLIS3
ANDI R5,>FFFE
MOV R5,R3
JMP PRLIS1
BACK RTWP
END
```

EXTENDED BASIC PLUS—

(Continued from Page 20)

covered what is unquestionably the best book on the subject I've seen: John D. Beasley's *The Ins and Outs of Peg Solitaire* (Oxford University Press, 1992), ISBN 0-19-286145-X. One reviewer called it "by far the best work on the subject," and it is certainly an essential for anyone who is serious in his solitaire, for it contains over 200 problems and their solutions and an extensive mathematical analysis of the game. (I should warn you, however, that it's priced at \$10.95, which I still regard as a bit expensive for a 275-page paperback.)

Next month I hope to share some of the new puzzles with, but this month I'll merely whet your interest with some of the names: Diamond, Crossbow, Longbow, Dead, Not Quite Dead, Snake, Zip, Letter B, Letter D, Swap, Triple Cross, Whither Will He Wander?, and The Lecturer and His Audience. All of these problems are included in the first chapter of Beasley's book. (By the way, Beasley has written an-

other interesting book in the same series entitled *The Mathematics of Games*.)

If you do decide to get your own copy of *The Ins and Outs of Peg Solitaire*, I should tell you that Beasley's numbering scheme for the board is different from that used in our own JUMP-A-PEG. Here's a chart to enable you to convert between the two:

Beasley a b c d e f g l 2 3 4 5 6
7

Traver 1 2 3 4 5 6 7 7 6 5 4 3 2
1

Thus what Beasley calls "cl" would be "37" in our version (following the system of numbering suggested by Martin Gardner in *The Unexpected Hanging and Other Mathematical Diversions*, a book also cited by Beasley).

Getting back to programming, you may be interested to see how the board was constructed, since the same approach can be used in similar situations (e.g., if you wanted to try to program a game of checkers). What the eye sees is not the same as what is really there when it comes to draw-

ing boxes on the screen, because each line that separates two boxes is "shared" by the two boxes. Or, rather, each line really belongs to only one of the boxes and not to any other. Thus each 24x24 pixel box really only includes a line on the left and on the bottom; lines for the right and the top have to be supplied by an adjacent box (or, in the case of boxes on the very top or on the very right, by specially defined characters).

It's hard to explain, so I've included a MERGE file called REDEFS/M to make it easier for you to see the redefined characters that are used as the building blocks for the gameboard. Here's how to use it:

1. Load JUMP-A-PEG into memory,
2. Enter MERGE DSK1.REDEFS/M, and
3. Enter RUN.

If you study the building blocks, you should be able to understand how the JUMP-A-PEG gameboard is constructed. (I've used the same technique in other pro-

(See Page 22)

D. Wright Stuff IT PAYS TO JOIN!

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Mail Room V2.01

Feature-laden program makes it among the best

By TOM WILLS

Mailroom may appear to be just another mailing label database program, but once you use it, you will realize it is much more. The author of Mailroom, Larry Tippet, designed the program to be a comprehensive, but easy to operate program. Larry, by the way, is a relative newcomer to the TI community, having purchased his first TI-99/4A console in 1988.

There are two similar, but distinct, versions of the program. There is the 40 column version which can be used by both the Geneve and the TI-99/4A, and an 80-column version which can be used by the Geneve and an 80-column card equipped TI-99/4A. The two versions virtually work identically. An important thing to remember is the 80-column coding was written with the 80-column cards for the TI-99/4A in mind, not the Geneve. With a couple of minor exceptions (noted further down in this review), the 80-column version will run without any problems on the Geneve.

EXTENDED BASIC PLUS

(Continued from Page 21)

grams — such as SHUTOUT — which use a block-type gameboard.)

Just in case you don't subscribe to the MICROpendium disks (if you don't, why don't you?), here's a listing for the simple MERGE file:

```
102 CALL CLEAR :: PRINT " C
HARACTER REDEFINITIONS":":TAB(8);"BUILDING BLOCKS";: C
ALL LINK("BDEF")
104 FOR I=96 TO 120 :: IF I/
4=INT(I/4) THEN PRINT "":
106 PRINT I;CHR$(I);" ";; N
EXT I :: PRINT "":":TAB(5);
"PRESS ANY KEY TO STOP"
108 CALL KEY(0,K,S):: IF S<1
THEN 108 ELSE END
```

Well, that's enough for this month. Next time we'll take one more look at JUMP-A-PEG, and then move on to other things. Until then, keep on compuTIn'!

Review

REPORT CARD

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

Cost: \$14.95

Distributor: Asgard Software, 1423 Flagship Dr., Woodbridge, VA 22192; 703-491-1267 (7-10 p.m.); 716-778-9104 (11 a.m.-7 p.m.)

Requirements: 40-column version: TI-99/4A or Geneve 9640, memory expansion. Extended BASIC module, disk controller and at least one disk drive, printer not required, but recommended. A modem is optional. 80-column version: Same as 40-column version, except that an 80-column card is required for the TI-99/4A.

After booting up the program, you will be presented with a 9 option main menu. The options are:

1. ADD TO ADDRESS FILE

When selecting this option, if the file does not already exist, you are prompted to initialize (create) a file by the name you entered, or abort the operation. When you are prepared to start entering, you are presented with 9 fields to fill in, with one (CORP?) already filled with an "N". The fields are the normal Name, Address, City, etc. entries you would expect from a mailing database. However, there are 2 additional fields here to fill in. They are "CODE" and "CORP?"

CODE is a way of classifying your entry with a 6 character entry. For instance, if the entry is for a relative, you might enter "RELATE". Or if a friend, "FRIEND". Or "WORK" if someone from your place of employment. The code you enter is strictly up to you. This helps when sorting and printing out your reports or labels or whatever. CORP? is an entry to determine

if the address entry is a corporation or business. If you answer "Y" to this prompt, you will receive an additional field to fill in. The field is ATTN and will appear right after you enter in the telephone number. When printing out an envelope or label, the ATTeNtion line will appear on your label in the spot recommended by the US Postal Service. This can prove to be a handy feature.

When you have finished entering the name information, you will be prompted if the data is correct. If not, you get another chance to correct it. If yes, you are prompted if you wish to enter another. If not, you are asked if you wish to A)abort, P)rint, U)pdate, or D)ial. If you choose to print, you are asked if you want to print to a L)abel, E)nvelope, R)olodex, or A)abort.

2. SEARCH/PRINT/UPDATE FILE

When selecting this option, you are prompted for a Global search string. After you enter the string and press Enter, the program will search for any occurrence of that string. Once a match has been found, you are queried if you wish to continue the search. If not, You are queried if you wish to U)pdate, P)rint, D)ial, or A)abort the search screen.

3. DIRECTLY INPUT ADDRESS

When selecting this option, you are allowed to enter a one-time mailing address. One-time means it will not be added to your database. After entering in the desired information, you are queried if the data is correct, and if so, what kind of printout you wish, as in options 1 and 2 above.

4. PRINT RETURN ADDRESS LABEL

This is a very simple option. All it does is prints your return address on a label or an envelope or whatever is in the printer. There is no query here as to what you what it printed on. The return address is set up through the Configuration and is the default.

5. CHANGE DATA DRIVE FROM

This option allows you to select a data drive different than your default drive.

(See Page 23)

MAIL ROOM V2.01—

(Continued from Page 22)

Again, a very simple operation.

6. CHANGE FILE NAME TO:

Here is a nice feature. Mail Room will search the data disk for any file which is an I/F-255 file (which is the standard Mail Room file size). The files which are I/F-255 will be displayed for you to choose from. If the file you are looking for is not on the disk, and you have reached the end of the files available on the disk, you are prompted to enter a new file name (initialize a new one) or to accept the last filename that was displayed.

7. VIEW NAMES OR PRINT DATA FILE

This is an option which will allow you to view the records you have on file. The only field displayed at this point is the NAME field. Up to nine names are displayed on the screen. Just above the file entries is a line on the screen which tells how many entries there are in the file, such as "125 RECORDS IN: SW99UG" with SW99UG being the name of the file. By pressing the space bar, you will scroll down the list of entries. On the bottom of the screen is a options with the selections M)ore, D)ial, A)bort, and Enter. By pressing the Enter key on the desired entry, you will be presented with a detail screen of the entry, which is the same screen as used in option 2, the update screen. In this screen you will have the very same options in the edit screen.

If you press M)ore, you will be presented with another nine entries, until you finally reach the end of the file.

You will notice that you have the ability to dial up the person (company) if desired. This is a handy shortcut. If you have no telephone number in the record, The dialing routine will abort.

8. GLOBAL UPDATE

Depending on what you wish to do, the global update can be handy, provided you need to update a number of the records in your file or you do not remember the exact spelling of the name of the person/company you wish to update. You may select the number of the record at which you want to start (such as record No. 29). Starting with the desired record, that record and all subsequent records are displayed with the prompt "CORRECTION NEEDED? Y/N/A". If No is selected, the next record

is then retrieved. If Yes is selected, you will be allowed to update the record and then continue the search. If A)bort is selected, you will be sent back to the main menu.

9. EXIT OR CONFIGURE PROGRAM

Just as the option says, exit the program. When this option is selected, you are presented with a sub-menu containing three options, C)onfigure, R)eturn, E)xit. E)xit will do just that, exit the program. R)eturn will return you back to Mail Room's main menu.

C)onfigure will send you to the Mail Room configuration menu, allowing you to change the defaults. The defaults include the drive, the filename, colors, modem strings, return address, and printer. Upon completing this task, you can chose to exit the program, or return to the main menu to continue the program.

PERFORMANCE: Mail Room performed extremely well. One example is the sort prior to printing. I have a 163 record database which, from the time I pressed the Enter key to start the sort til the printer started printing, was just short of 2 minutes, which for a TI-99/4A is rather good.

The error routines built into Mail Room work very well. I was never able to crash the program. However, When running Mail Room on the Geneve, it seems to alter the character set so that when you leave Mail Room, your character set is still messed up. This was the only actual flaw I encountered. There can also be a problem on the Geneve, where the speed of the machine will cause the cursor to skip a field. If this is encountered, slow down your machine until it works properly. The keyboard being used can also make a difference.

Because the only problems encountered were only on the Geneve, and were very minor, the performance rating of Mail Room should still be given an "A+." It must be remembered, the coding in the 80-column version was actually written for the 80-column cards used in the TI's, not for the Geneve.

EASE OF USE: Larry designed this program with the average person in mind. It is as easy a program to run as you could want. What more can I say besides that? But, because some users may find certain

parts of Mail Room confusing, due to the complexity of the software, despite all of Larry's efforts to overcome this possibility, I am only giving it an "A" here. As a programmer myself, I realize that no matter how hard one tries, what may be easy and straightforward to one person can be as clear as mud to the next.

DOCUMENTATION: Some of the best I have yet to see. Larry tells me that Harry Brashear did the docs. All I can say is "Bravo!" Larry/Harry made these docs very clear and wrote them using English words that everyone can understand. The docs are well organized and very complete, without becoming wordy. A big "A+" here!

VALUE: This program, as with any software, depends on whether you need it or not. I feel the value of Mail Room is right up there just because of the added features that Larry was wise enough to include, such as the dialer option, the printing to the envelope option, etc. I find it valuable; after all, it is easier to let the computer dial the telephone than it is for me to remember the numbers of all the people I wish to call. However, because of the limited use for the program (as with any program), I feel I can only give it an "A," but it is an high "A," just under "A+."

FINAL GRADE: If I was assigning stars as Stan Krajewski does in his Micro Reviews, I would give Mail Room 4 stars. I, therefore, am giving Mail Room a final grade of "A+." I feel this is a must program for anyone who uses the telephone and mails letters.

TPA available again

Gerald D. "Dee" Turner says he has taken over distribution of The Printers Apprentice (TPA) by Mike McCann, and will be doing periodic updates for the program.

Contact Turner at 450 Skylark Dr., San Bernardino, CA 92405, (909) 881-8879.

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MICRO-REVIEWS

The Animator and The M.U.N.C.H. Video

By STAN KRAJEWSKI

I was planning on doing a review on the new Horizon Mouse. However, the software I received with it is defective and I'll run that column when I get it worked out.

Ratings for the software reviewed in this column are based on the Star system that follows.

★ Leave it alone, back to the drawing board.

★★ Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

NOTE: If the Geneve 9640 is *not* specifically mentioned in system requirements of any column I write, the program is TI99/4A compatible only.

★★★★

THE ANIMATOR

If you love to draw or create special effects on the TI or Geneve, then you'll love this one. Even if you're not a graphics person, you'll want to try it. The effect of animation is created by drawing individual frames, then displaying them one after another. This program is all you need to draw, save and then run all your frames to create your animated graphics. System requirements are Geneve 9640 or TI99/4A, 32K RAM, disk drive, Extended BASIC and a joystick.

I just love a good title screen. The title screen upon auto-loading from XB meets my expectations. After all, an animator program should display what it can do! The five modules plus several packages in this program make it complete. The Main Menu options include Animator, Conversions, Configure, Printout Frames and Load Utility Program.

I'll start with the Animator option. This is the heart of the program. The animator is an Extended BASIC program that allows you to create your own graphics for whatever purpose you choose, without having to know how to draw on an Artist program. This program lets you draw and create your effects, all within this one environment. Selecting Animator from the main menu

puts you in the drawing mode of the program. When you are in the program it looks like the zoom mode of an Artist program. You create your picture by drawing one square at a time with your joystick. The joystick button acts as the toggle between the Draw and Erase modes. Other options are three editing grids, invert pixels, recall frame from buffer, shift frame, set animation sequence, start animation and a few other commands.

Conversions is a utility that allows you to move data into the animator program. It also allows loading of a TI-Artist Instance for converting to a Animator format. Loading and saving options are also here for file manipulating and creating your XB Merge file for an XB program.

The Configure option lets you preset your configuration by assigning joysticks, screen columns, printer codes and animation size and speeds.

The Printout Frames option prints out each frame for editing. A printout feature lets you make a hard copy of your animations.

The Load Utility Program is reserved for future expansion; however, it may be used to create your own animator utility. The animator comes on two SS/SD disks (an Example disk and a Program disk). I liked working with the program and found it easy to use, even though I do not use drawing programs much. The 22-page manual included covers all aspects of the program.

The Animator is available from Asgard Software, 1423 Flagship Dr., Woodbridge, VA 22192. The price is \$14.95 plus \$3 S&H.

★★★★

THE M.U.N.C.H. VIDEO

This is the MUNCH video. "How to Clean Your Computer." This comes on a VHS video cassette and a VCR is required to play it. It is a fund raising program to help support the Massachusetts Users' of the Ninety-Nine and Computer Hobbyists group.

The video starts out with identification of the TI consoles, a list of tools needed and their purpose. The procedure is then explained regarding how to remove the back cover and remove the internal boards. Both the black and silver and the tan consoles are worked on simultaneously for owners of either system to follow. Details receive close attention so that anyone without electronic experience can follow along.

Next the video explains a cleaning procedure. It starts with cleaning the cartridge port and the right angle adapter, then goes on to cleaning the edge connector. Once again, details are pointed out very well so anyone can do this. For those who want to stop there at the cleaning, the video goes on to how to reassemble the console.

For those who are a little more adventurous, there are other ideas to try. One idea is air holes in the console, in the form of a design, to relieve the heat from the power supply. The video also includes a procedure for changing a resistor on the motherboard for improved video reception. No more white shadows when looking at the text and better graphics!

The video is well done and it is a great help to have someone there to explain and show you everything. The video is a lot easier to follow than directions on paper. Computer cleaning items are also introduced to you to let you know what's out there. And the video has a lot of close-ups enabling you to see all components being worked on.

For your copy of "How to Clean Your Computer" send \$9.95 plus \$3 S&H to M.U.N.C.H., C/O James W. Cox, 905 Edgebrook Dr., Boylston, MA 01505.

If you would like your software or Hardware reviewed in this column, you may send it to Stan Krajewski, Route 6, Box 568-15, Live Oak, FL 32060. If you would like it returned, please include postage. If you need to call me for any reason, you may reach me at 904-364-7897 E.S.T.

Newsbytes

Orphan Reunion set for May 15

The Fourth Annual TI Orphans Reunion is scheduled for May 15 in Edmonton, Alberta, Canada, according to Don Nast of the Red Deer TI99ers.

Fair hours are 10 a.m. to 5 p.m. at the Zurich Insurance Claims Centre, 9715 Ottevell Rd. (corner of 98th Avenue and 72nd Street), hosted by the Edmonton Ninety Niner Computer User Society. Nast expresses appreciation "to the generosity of Zurich Insurance Canada Ltd."

He notes, "It is the largest TI fair in western Canada and always has lots of demos, swap tables, etc. Everyone is welcome."

For more information, contact Ron Hohmann, (403) 456-0862.

Harrison produces Font Dumper

Harrison Software has released a new product which the company developed in response to a challenge from Jim Peterson of Tigercub Software.

The challenge was to develop the capability to download his screen fonts to the printer as NLQ (near-letter-quality) characters, so that various fonts could be used on the printer as well as on the screen., according to Bruce Harrison of Harrison Software.

The new product, Font Dumper, works with Star NX-1000 and NX-1020 printers. It comes on two SSD disks, one with programs and one with 32 fonts from Peterson's collection of 127 screen fonts. Those who want the full set of 127 can get them from Tigercub Software, 156 Collingwood Ave., Whitehall, OH 43213, but should specify the printer download versions, Harrison says.

The Font Dumper package includes programs to modify the existing screen fonts and several ways to perform the download to the printer. Using it requires a TI99/4A (not Geneve) with Extended BASIC, 32K and at least one SS/SD disk

drive. Modifying fonts requires Editor/Assembler as well, Harrison says.

The package, in either version (specify printer), sells for \$10., including S&H, from Harrison Software, 5705 40th Place, Hyattsville, MD 20781. For more information, call (301) 277-3467.

80-column editor released for F'web

Tony McGovern of Australia has released a "completely rewritten from source code" Funnelweb V.5 80-column editor, according to Charles Good of the Lima Ohio Users Group.

The files for this software, plus some supplementary files such as extra help screens and demo text files, are available in DSSD unarchived format from the group. To receive them, send two disks and a self-addressed return mailer.

"No money is required, but a fairware donation directly to the author will be appreciated," Good notes.

McGovern expects to release a similar 40-column editor soon which will be available from the group in the same way.

The editors are designed to be run from the Funnelweb V4.4 environment, Good notes.

Send requests to Good at Lima Ohio User Group, P.O. Box 647, Venedocia, OH 45894.

OS99 V4 released

Guy Neubert of Kirkland, Washington, has released OS99 V4. The program is distributed by Tex-Comp.

Neubert says the new version corrects a bug found in V3, simplifies the command-line interface and improves the documentation.

The "bug" affected the ED (edit) command, according to Neubert. If a floppy disk was used as the default device and a non-existent file name given in order to create a new file, it would not do so.

"This is the type of thing we had hoped to discover and correct before the original

release; apologies," he says.

According to Neubert, the most apparent modification affects the "\$" commands which modify the default parameters. These commands now check for write-protection of the GROM emulator and give a suitable message if it is write-protected. An additional external command is included for use with the Cor-Comp Memory-Plus RAM disk.

"Not all managers work with this card and some disk utilities can be risky," Neubert comments. "The card does have its own disk manager in ROM which is always available. There was no way to reach it from the OS99 command line, however. The commands RMGR and RAMGR are provided to correct this. Typing one or the other (two versions of the card were produced) as a command should go directly to the Memory-Plus manager."

Freedom Station holds mouse wires

The Freedom Station is a mouse peripheral which is designed to project, suspend and lock a mouse cord above the work station. According to the manufacturer, the projection tower enables the cord to rotate freely around the workspace following the mouse. The tower is made of dual balanced flexible compression coils and a projection clip and is designed to simulate the feeling of a wireless mouse, according to the manufacturer.

The Freedom Station sells for \$29.95, shipping and handling included, continental U.S. only, from CP Research Inc. of Augusta, Maine. To order, call 1-800-452-7546. The manufacturer says dealer inquiries are welcome at 1-800-582-2909 or fax (207) 775-6779.

Reach thousands of TI and Geneve users free of charge. Send your announcements of products and services for TI and Geneve users to MICROpendium Newsbytes, P.O. Box 1343, Round Rock, TX 78680.

TRIALS OF A c99 BEGINNER

Quick sort with random access files

By CHARLES E. KIRKWOOD JR.

This article tells how we can sort 1000 — 2000 — 3000 — perhaps more—character strings with up to and including 80 characters using QUICK SORT (this sort routine was discussed in Jerry Stern's article in MICROpendium May 1991).

How can we sort this large a file? The character strings are stored in records in a file on a RAMDISK. A disk will also work, but this will give the disk drive quite a work-out and will be slower. The character strings to be sorted must be stored as records in an internal, relative, fixed length file. In this way we can access them much like accessing elements in an array.

Tom Bentley wrote an I/O library which can be used with fixed internal files. Some information about this library is:

TCIOI is the include file containing I/O definitions and REF directives for the TCIO file. The following are defined: File Type, SEQUENTIAL or RELATIVE; Record Type FIXED or VARIABLE; Data Type, DISPLAY or INTERNAL; and Mode of Operation, UPDATE, OUTPUT, INPUT or APPEND.

```
#include DSK1.TCIOI
```

TCIO contains the I/O functions and is linked to the object program along with CSUP.

Declare:

```
int filptr,eof,rec,access,fsize;
char name[ ],buff[ ];
```

```
filptr=fopen(name,access,fsize);
```

Example:

```
filptr=fopen("DSK1.FILE",INPUT+INTERNAL+RELATIVE+FIXED,80);
```

The access for a random access file will be UPDATE+INTERNAL+RELATIVE+FIXED.

```
eof=tread(buff,rec,filptr,fsize);
```

If eof is -1 it is a valid end-of-file, if it is -2 there is an error. The character buffer, buff, should be at least one more than the size of the record, fsize is the actual size of the record, and rec is the record number.

```
eof=twrite(buff,rec,filptr,fsize);
```

```
eof=tclose(filptr);
```

Note that eof may be omitted from the statements.

The maximum length of the character string records is set as d2, 81 characters. To save memory the two functions strcmp() and atoi() are copied with the program rather than including all the STRING (STRINGFNS) and CONV (CONV;C) function libraries.

The program is written as a general purpose program so that it can be used for different fixed length records without having to recompile the program. The length of the fixed length record is typed in as data from the keyboard. You remember that QUICK SORT started with element one and not element zero of the array. The sort function starts with record one also. That leaves record zero free. This record zero can be used to store the number of records to be sorted or it can be ignored completely. The program is written so that you can choose to access record zero to input the number of records or type the number from the keyboard. It is assumed that the records to be sorted have already been stored in the RAMDISK as internal, relative, fixed. The sorted records will end up in the same file. For those who might like to time the sort routine the words START and STOP appear on the screen at the beginning and end of the sort, respectively.

There is no print-out of the file in this program.

See the December 1992 MICROpendium for a c99 conversion program that will either convert a variable display file to a fixed internal file or vice versa. This program automatically stores the number of records in record zero of the fixed internal file.

Note that there are three arguments for the sort function: the number of records, the disk and file name, and the record length. The library files CSUP and TCIO must be linked with the object file of FILESORT;C.

When space permits MICROpendium has been including both the source file and the ready-to-run program using E/A 5 on its monthly disks. No knowledge of c99 or any of the files of c99 are necessary for the user to use this E/A 5 program.

FILESORT;C

```
/*FILESORT;C*/
#define d2 81
#define d1 3001
#include DSK1.TCIOI

strcmp(s1,s2)
char *s1,*s2;
{
    int r;
    while(*s1|*s2)
    {
        r=*s1-*s2;
        if(r)
            return(r);
        else
        {
            ++s1;
            ++s2;
        }
    }
    return(0);
}

atoi(s)
char *s;
{
    int sign,n;
    while(*s==' ')
        ++s;
    sign=1;
    if(*s=='-')
    {
        sign=-1;
        ++s;
    }
    n=0;
    while(*s>='0' & *s<='9')
        n=10*n+(*s++)-'0';
    return(sign*n);
}

main()
{
    int i,n,c,df,k,r,ds;

```

(See Page 26)

TRIALS OF A c99 BEGINNER—

(Continued from Page 26)

```

char a[d2],nr[d2],rl[5];
puts("      FILESORT\n\n");
puts("      Program uses QUICK SORT\n");
puts("      with random access records\n\n");
puts("Program sorts character strings with 80\n");
puts("or less characters.\n");
puts("Numbers must be padded with zeros or\n");
puts("blanks so that the decimal points\n");
puts("line up.\n\n");
puts("RECORD LENGTH ");
r=atoi(gets(rl));
puts("\nDISK and FILE ");
df=gets(nr);
dsk=topen(df,UPDATE+INTERNAL+RELATIVE+FIXED,r);
puts("\nNumber of items input from FILE or\n");
puts("KEYBOARD (F/K) ");
c=getchar();
if(c=='F')
{
    k=0;
    tread(nr,k,dsk,r);
    n=atoi(nr);
}
else
{
    puts("\n\nInput number of items ");
    n=atoi(gets(nr));
}
putchar(10);
puts("\n\nSTART");
sort(n,dsk,r);
puts("\n\nSTOP");
putchar(10);
fclose(dsk);
}

```

/*CHARACTER STRING SORT*/

```

/*Translation and modification of*/
/*QUICK SORT, MICROpendium May 1991*/
/*for random access records*/
sort(n,dsk,r)
int n,dsk,r;
{
    int w,k,i,a,b,u,m,c,s[d1];
    char z[d2],x[d2];
    c=0;
    k=1;
    i=0;
    s[1]=1;
    s[2]=n;
    while(k!=0)
    {
        k=k-1;
        i=k+k;
        a=s[i+1];
        b=s[i+2];
        tread(z,a,dsk,r);
        u=a;
        m=b+1;
        while(c==0)
        {
            m=m-1;
            if(m==u)
                break;
            tread(x,m,dsk,r);
            while(strcmp(z,x)<=0)
            {
                m=m-1;
                tread(x,m,dsk,r);
                if(m==u)
                    break;
            }
            if(m==u)
                break;
            twrite(x,u,dsk,r);
        }
    }
}

```

```

++u;
if(m==u)
    break;
tread(x,u,dsk,r);
while(strcmp(z,x)>=0)
{
    ++u;
    if(m==u)
        break;
    twrite(x,m,dsk,r);
}
twrite(z,u,dsk,r);
if(b-u>=2)
{
    i=k+k;
    s[i+1]=u+1;
    s[i+2]=b;
    ++k;
}
if(m-a>=2)
{
    i=k+k;
    s[i+1]=a;
    s[i+2]=m-1;
    ++k;
}
}
return;
}

```

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User Notes

Troubleshooting Horizon RAMdisks

This item, including the accompanying flowchart, was written by Stephen Andrews of the North Bay 99ers. It was published in the group's newsletter.

Certain coincidences made me decide to

write an article, or sort of quick reference guide for users of Horizon RAMdisks (HRD) of all types. Recently, I started with a call from our newsletter editor asking questions about a new HRD test program from OPA (Oasis Pensive Abucators) and problems he was having with one of his HRDs. We discussed the problem, determined that it was not likely caused by the

hardware and decided on a course of action.

We said our goodbyes and I went to my system to work on something only to find that my own system would not boot. This is where the real story begins.

Anyone with an HRD, with any of the new RAM Operating Systems (ROS) installed in memory, as opposed to some of the EPROMs that are available, has had this problem. (Come on, be honest.)

At this point you have a lot of options. You can shut everything off and walk away, but that will not solve anything. You can remove the batteries on your HRD(s), replace them and start over, but that means you have lost everything you have changed since your last backup. (You do backup, right?)

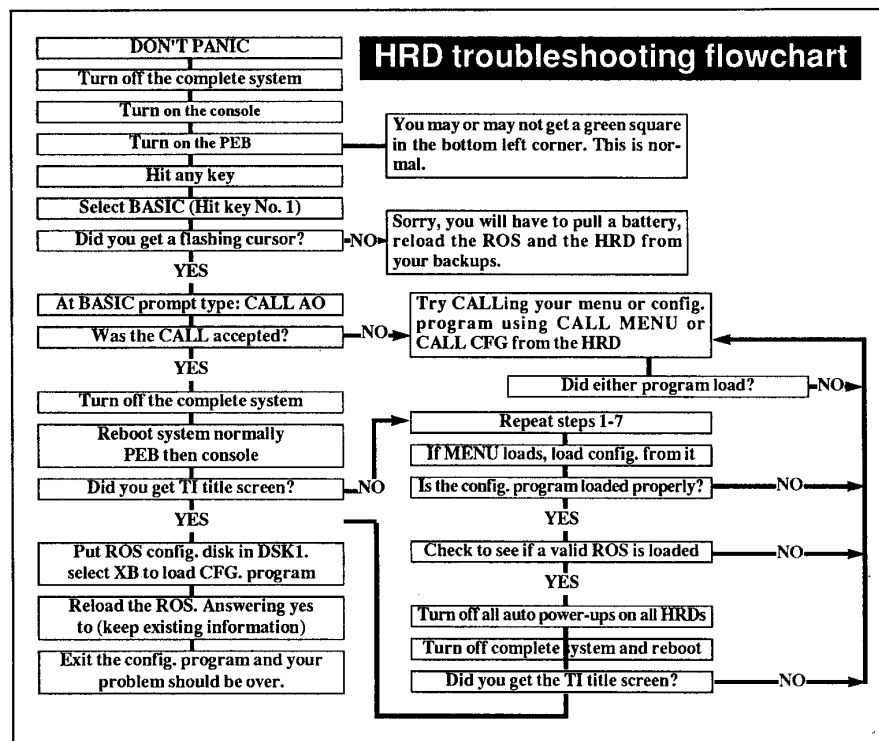
You can hide the HRD from the console with the switch on the back of the card, but we are not all lucky enough to have that option because older cards which do not have the switch.

You could remove the card, put it in the closet and you will never have the problem again. (No, no, that just wouldn't do.)

These are all options, but not very good ones, so let's discuss the alternatives.

I am the club librarian and when trying out many new programs, or reviewing older ones, I often have conflicts with the ROS on my cards that make the system appear to be messed up. If, however, I re-

(See Page 28)



Feedback

(Continued from Page 7)

adapter plate to get DSK3 or DSK4.

This is where it gets confusing. I prefer the modifying of the adapter plate, as you have more room and you can see what you are doing. You can then have a separate adapter plate for drive 2, drive 3 and drive 4

Without changing the cable, you then must check the adapter plate and find pins 6, 10, 12 and 14. Remember, the slot is near the No. 2 pin. Pin 6 is the select switch for activating drive 4.

Pin 10 is the select switch for activating drive 1.

Pin 12 is the select switch for activating drive 2.

Pin 14 is the select switch for activating drive 3.

With this information you then:

Cut the No. 14 pin at the cable end and the No. 10 pin on the adapter plate and short across from input pin No. 14 to pin No. 10 to make this drive operate as drive 3.

Next cut the No. 6 connector at the cable and No. 12 pin on the adapter plate, then short across the adapter from input pin 6 to pin 12 to make this drive operate as drive 4.

Using the adapter plate, you do not interfere with the signal going to any other drives.

With this method you can mix any combination of drives.

I do find the crossing of wires causes problems and the cable can only be used with this system.

I hope this clears up the misunderstanding about the drives.

Frank W. Aylstock
President, Brea User Group
Yorba Linda, California

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

User Notes

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member some simple rules, I can often recover from what would seem a complete disaster.

I start by having the ROS config program on HRD No. 1. Then, when my system locks up, I start at the top of the flowchart and follow it through with my fingers crossed. Generally, only the ROS is damaged and when reloaded, usually all of the data is intact on the cards. Good luck.

Making help screens in Funnelweb 5.0

This item, was written by Jim McLaren of the Sudbury 99ers.

One of the new features of Funnelweb is the help screens. There were eight help screens included in the beta version of Funnelweb 5.0. At first I thought making your own help screens would be similar to configuring Funnelweb. To my surprise, the help screens are very easy to make.

In the 40-column version, you simply access Funnelweb and the normal editor. Your help screen file is a D/V80 file that you create with the Funnelweb editor and, once you create your help screen, Funnelweb will convert the D/V80 file into a program file format using a program called HELPM4KE4. Let's take it a step at a time

and see how easy it is to create a help screen.

Go into the Funnelweb editor. Create your D/V80 file, keeping in mind that you are restricted to 24 lines and 40 columns. This is all you will be able to view on the 40-column version. I imagine the 80-column version allows more columns and perhaps lines.

If you create a 25-line help screen, the last line will not appear when you display

the help screen. Any characters past the 40 columns will be truncated as well.

I decided to make up a D/V80 file on the different keystrokes for my Rave keyboard. I am forever forgetting what the keystroke for OOPS is. The file is listed in box below.

As you can see, I have doubled up on some of the keys (F1/F2). I had to compromise to get all the keys and functions on one screen of 24 lines.

Once I completed my D/V80 file using the Funnelweb editor, I saved the file to disk under the name "DSK2.KEYS "

I then used Diskreview (V4.40) and located the filename HELPM4KE4 on the beta disk. I typed "R" beside the file and answered all the usual Funnelweb prompts. The following screen appeared:

FW ED 40 HELP FILE MAKER
Input From: DSK2.KEYS (I typed in my D/V80 filename)
Output to: DSK8.HELP4D (The DSK8.HELP4D is the default. I changed the drive number to DSK2 and changed the last letter from "D" to "H" to replace the last help screen.

Remember, there are eight help
 (See Page 30)

RAVE KEYBOARD (TI/W - Shift Lock Down)

Key	Function
F1 / F2	Character Delete / Insert
F3	Line Delete
F4 / F6	Roll Page Down / Up
F7	Tab
F8	Insert Blank Line
F9	Command/Escape
F10	Display Line Numbers
F11	OOPS!
F12	Reformat
F13	Screen Color
F14 / F16	Next / Last / Paragraph
F15	Duplicate Line
F17/ F24 / TAB	Word Tab / Back Tab / TAB
F18	New Paragraph
F19	New Page
F20	Word Wrap
F21/F22	Begin/Delete End/of Line
F23	Back Tab
Escape	Return to Command Line

READER TO READER

□ Bill Gaskill, 2310 Cypress Court, Grand Junction, CO 81506, writes:

I am trying to verify the existence of the following cartridge titles and would like to hear from anyone who actually owns one in the flesh. If you do, please write me describing the shape, color, label color, color of the print on the label and the product number of the cartridge.

1. TI Investment Analysis module supposedly released in 1979.
2. Imagic Demon Attack (not Super Demon Attack) module.
3. Imagic FLAP module announced in September '83 issue of *Enthusiast* 99.
4. Atarisoft Joust, Robotron:2084, Star Gate and Super Storm modules.
5. Sierra On-Line Jawbreaker (not Jawbreaker II) module.
6. TI ACS Protection PHM 3063.
7. TI Computer Tutor PHM 3170.
8. Romox Character Crayons.

9. TI Nutrition Analysis.

10. TI Diagnostic module PHM 3000 released in 1979.

11. The location of any published announcement detailing the release of the Number Readiness module by Milliken Publishing. I'd like to know what magazine, flyer or official or commercial publication contains this information, and I'd like to know the month and year of the publication.

□ Gene Downs of the Danville 99(ers), 888 Airport Rd., Danville, KY 40422 writes in response to January Feedback items by Frank D. Ormonde and Al Morgan:

Getting children to use the 99/4A computer and "step by step" instruction in X BASIC programming is what we do here. It is listed in our manual of operations as "the primary objective" of this group. We do this not only on location but help 109 others through the mail.

Reader to Reader is a column to put TI and Geneve users in contact with other users. Address questions to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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screens included with the beta version. Note, too, that Funnelweb allows you to change only the drive number and the last letter after "HELP4" in the help screen filenames.

It took only a few seconds to convert the files from D/V80 to a program (help screen file).

I then proceeded to load the new beta 40-column version of the editor. I then typed "H" for help screens. The help screens were then loaded and I pressed "A" to advance to the last help screen, "H." Presto, there was my newly created help screen.

After further exploration I found that you can create more than eight help screens. I created additional screens by simply adding the next letter of the alphabet at the end of "HELP4." I now have ten screens, labeled through "HELP4J." Obviously, you can create additional screens as well.

Five tips to keep in mind

The following item was written by Andy Frueh of the Lima (Ohio) User Group.

This article deals with several unique tricks that I found very useful.

1. When you have a D/V40, 132 or whatever text file that you need to edit with TI-Writer, you can change it to a D/V80 file by using a sector editor. TI-Writer will load only D/V80 files. Do a search file with your sector editor to find the header sector of the D/Vxx file. Edit that sector in hex mode. Go to byte >11. If the file is D/V40, you should see a number 28 at that byte. To change it to an "80," type a number 50 over the 28. In ASCII mode, you would see a (for a D/V40 file, and the letter P for a D/V80 file.

2. Remember that "E" is an accepted number in TI-Writer. For example, if you need to delete from line 741 to the end of the file, you can enter the following after initiating the delete function from the command line: 741,E. Lines 741 through the end of the file will be deleted.

3. You can hook up your computer to a VCR using a standard 300 ohm to 75 ohm TV antenna adapter. These can be found

with virtually all home video game systems, or at radio supply stores. Discount stores even carry them. The adapter has a cable-TV male connector and two screw terminals. The male plug goes into the "cable in" jack of the VCR. The screw terminals go to the modulator's "to TV" wire. You can then hook the VCR to a stereo's "aux in" jack, using a standard audio/visual cable. Plug the other end into the "audio out" on the VCR. You can then hear improved sound and tape record the computer's audio output, both audio and video, on the VCR. This isn't as good as using a monitor cable into the "audio in" and "video in" of the VCR, but it works for those without monitors or cables.

4. If a disk doesn't seem to initialize, don't give up. First, inspect the disk for cuts or grooves. Check the visible surface on the back of the disk, since the drive records data on the surface opposite of the labeled side. If nothing looks wrong, continue to re-initialize the disk. Make sure that you validate each sector. Chances are some sectors will be bad. Choosing a validate feature marks each bad sector as used. After trying this for a while, the disk should operate.

5. Finally, for those without a monitor, here is another use for the adapter mentioned above.

I have the following display set-up: One TI computer has two separate RF modulators. Each one is constantly hooked up to a TV. Only one of the DIN end plugs is connected at a time. I use a small black and white TV on the PEB (with adequate ventilation) whenever anyone needs to use the larger color TV (which is also connected to cable and a Nintendo). The problem is when I'd use the color TV, either with the computer or without (i.e. I'd be using the b/w TV), I would get interference from the computer. Placing the antenna adapter between the color TV and its modulator clear up the interference.

Fix DSKU to boot Funnelweb

This item was written by Charles Good, of the Lima User Group.

DSKU V4.2 was distributed by the

Lima User Group with Funnelweb V4.4 and the earlier V4.31. There is an item on the main DSKU menu that says "LOAD FW." It usually doesn't work. The reason is that DSKU searches the drive you specify for a file named UTIL1, which is what the main Funnelweb files used to be called. The main Funnelweb file is now called FW.

It is easy to modify to boot file FW every time you ask DSKU to "Load FW." Here's how:

Use Funnelweb's Disk Review or other sector editor to search for the third DSKU file (named either DW or DSKW) for the ASCII text "UTIL1." You will find "DSK1.UTIL1." Change UTIL1 to "FW" and put blank spaces over the "IL1." Then change the screen display to hex (CTRL-W and then CTRL-A if you are using Disk Review). This change shortens the length of the text the computer expects to find since DSK1.FW is shorter than DSK1.UTIL1. DSKU will now properly boot Funnelweb when you select "Load FW" from DSKU's main menu.

Printer advice for TI-W users

The following, by Steven Shaw, is excerpted from TI*MES, the newsletter of the TI99/4A User Group of the United Kingdom.

One heart-felt cry, from more than one member, involves the printing of text files using TI-Writer. TI-Writer normally sends a carriage return and line feed at the end of each line, and life is much easier if you switch the internal DIP switches in your printer so that your printer does not itself add an automatic carriage return and line feed at the end of each line! If both the printer and TI-Writer add a line feed, you end up with double spacing, whether you want it or no.

The TI RS232 card contains a number of software switches, and if you use RS232 as your printer name you will certainly know about those! However, PIO users generally have little call to use them and so remain unaware.

You can instead of using just PIO, name (See Page 30)

User Notes

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your printer as PIO.CR or PIO.LF — if you use the formatter you may need to use PIO.LF even if PIO on its own is okay when printing from the editor. If you ever use a graphics program, you will need to use PIO.CR to prevent an automatic carriage return every 80 characters — something that can make your graphics look a little untidy. In case of difficulty with line feeds, go through all the possible printer names and use the one that is best, be it PIO.CR or PIO.LF or possibly PIO.CR.LF. It makes life easier if you can switch the auto line feed off at the printer. Consult your printer manual for instructions.

Another problem is the use of printers which are not 100 percent compatible with Epson control codes. When printing text which has these codes embedded, you may meet problems — such as a printer freeze. Again, TI-Writer was written to take care of this problem. You may instruct TI-Writer to print the text file but to strip out the control codes — that is, to print only the “printable” characters from ASCII 32 to 132 — to do this. Instead of using the output device name of PIO you use C PIO — that is, a capital C, followed by a space, followed by the normal printer name.

As a reminder, if you want TI-Writer to save in D/F80 format instead of D/V80, select PF then type F DSK1.FILENAME — use the print file command instead of the usual save file, and add an F and a space in front of the output device name. You remember, of course, that TI-Writer can load both D/F80 and D/V files longer than 80, but only load the first 80 characters of each record. TI-Writer is an unusually well-written program! And remarks regarding TI-Writer also hold true for Funnelweb.

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