Covering the TI99/4A and the Myarc 9640

MICROpendium

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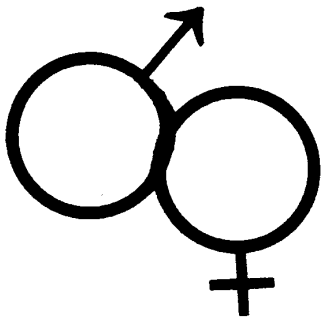

SEX
and Extended BASIC

See Page 9

Also:

MDOS buyout due this month

PC emulator project

Pivot circles in BASIC

Geneve compatibility in Assembly

Printall program

Reviews of GENeric DIRectory, Smart Connect, Fonts and Borders Vol. IV, Pollster, Astro-Mania, Encyclopedia of Graphics Vol. 3

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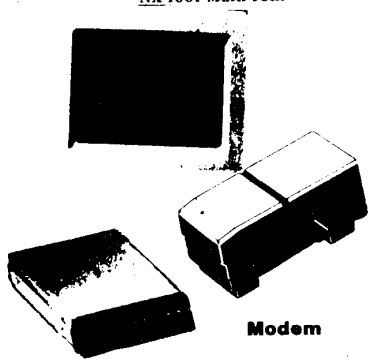

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*READ THIS

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

Comments

MDOS deal is nearly done

It looks as if the buyout of MDOS from Myarc is nearly complete. Spearheaded by Beery Miller, the project has raised most of the $10,000 that is needed to cement the deal. Only a few hundred dollars remained to be raised early this month. The deal includes the source code for MDOS, Myarc Advanced BASIC and the P-system.

What does this mean to the average Geneve user, if there is such a person? For one, there will be new hope that the MDOS operating system will be debugged and improved. Improvements will be made to some extent based on input from those users who have contributed to the buyout fund drive. As part of the deal, Miller has also agreed to send copies of the final MDOS to all registered Geneve owners, as determined by Myarc records. (For those with short memories, the *final* version of MDOS, along with Advanced BASIC were supposed to have been mailed by Myarc in November 1990.)

I would suggest that those who have never registered their Geneve's or purchased their Geneve's from another user would do well to send some sort of contribution to Miller. Even though Myarc had promised a final version of MDOS, Advanced BASIC and the P-system as part of the Geneve, there's no way that it is going to happen. Loyalties now will have to lean toward Beery Miller and his group. Whether this benefits Geneve users will be seen in the future. But at least Myarc is now out of the loop, which should initially relieve a lot of frustration. For now, as a Geneve owner, I'm optimistic.

USER GROUPS PRODUCES VIDEOS

Lately we've been seeing more and more videos released by TI user groups. No, you won't see them on MTV. But one in particular sound like a great idea. The Massachusetts Users of the Ninety-Nine Computers and Hobbyists (MUNCH) have released a self-help video called P.Y.I. (Protect Your TI Investment). The video features tutorials on taking a TI console apart, cleaning it, identifying the various boards and parts and other useful tips. This type of information is often printed in newsletters and in MICROpendium, but seeing it on TV may make some of these useful projects more accessible to those who are uncomfortable taking their consoles apart. (See the article elsewhere in this edition for ordering and other information.)

TI EMULATOR ON A PC

Mike Wright is seeking support for a TI emulator that runs on a PC. This software project is feasible, according to Mike and Barry Traver, who's seen some of the results. We're printing an item about Mike's project in which he would like to see 1,000 TI users send him a dollar signifiying their support. I don't think there's any problem with sending a buck, but I don't see how 1,000 users will do this. Mike set a deadline of Sept. 15 for these contributions, which seems unrealistic. The interests of TI users are too varied to expect this number of them to jump on the band wagon. But who knows, maybe we'll see someone running Munch Man on a PC sometimes. It can happen.

—JK

BUGS & BYTES

Is it still MS?

Mickey Schmitt, who along with Mike Sealy is a partner in the MS Express software company, was married to Mike Cendrowski July 25 at the Cheswick Presbyterian Church, Cheswick, Pennsylvania.

Members of the West Penn 99ers were invited to the ceremony, which was followed by a picnic reception in Deer Lakes Park. The couple lives in Russellton, Pennsylvania.

Boone developing faster CC40

According to a message on Delphi's TI-NET, Barry Boone has modified the CC40 so it runs cartridges at least twice as fast, with some up to seven times as fast.

He's working on modifying the entire CC40 so that it will run seven times as fast and hopes to have his "Turbo CC40" at the Chicago TI-Faire Oct. 31.

Going, going, ...

Some of the classic equipment, TI and third-party, for the classic TI99/4A is in short supply these days, with dealers having to get it from other dealers.

Help by phone for 9640 owners

Don Walden of Cecure Electronics, who repairs the Geneve 9640, says he can often help hardware-handy Geneve owners to do-it-themselves, so they don't have to send their machines in for repair. Cecure Electronics' phone is (414) 529-2173.

Feedback

Prodigy update

Here is updated info on the TI/Geneve Club on Prodigy. Many have claimed membership!

• Frank P. DeCandia (Tron) (VSSN89A), acting coordinator.

• Edward Kuehn (DTVH43A), co-coordinator.

• Jim Swedlow (KMC30A), official member of club support staff.

Here are the guidelines we ask new participants to live by.

• Being a member is as easy as following the next three rules. If you think you can contribute significantly to this effort, please contact Frank P. DeCandia (A.K.A. Tron) (VSSN89A). If you qualify as having special skill and/or knowledge, you will become part of the support staff.

• Standard Prodigy BB rules apply. We also ask that all TI related NOTES be written in the COMPUTER CLUB section under the OTHER PC TOPICS section only! Please start all related NOTES with "TI." Ex: TI HELP, TI-99/4A TODAY.

• Please keep all notes public (especially to support staff), unless they are private in nature. This gives everyone access to all the juicy info.

• YOU ARE SOLELY RESPONSIBLE TO CHECK FOR NEW TI TOPICS. No private E-mail notifications are sent due to the large number of people claiming to be members.

This is the first continental TI support board there is. Any and all 99ers are encouraged to support this effort.

Frank P. DeCandia
Jersey City, New Jersey

MY-SLEEVE for TI?

In your February 1991 issue there was a program called "MY-SLEEVE" by Jim Uzzell, but it was written for Geneve. Is there any way this program could be adapted for the TI99/4A or is it available in this format from some other source?

I have been using the sleeve program from the 1986 issue for many years, but it had some problems, and I would prefer the new format with the comments moved to the back of the sleeve.

Please advise me if it is available from MICROpendium on disk or where I may obtain it if not.

Robert E. Knight
Lisbon, Connecticut

Our February 1991 disk contains the program, but for Geneve 9640 only. We don't know of any adaptation for the TI, but would be interested in hearing about one if it exists. — Ed.

Requirements listed

This is in response to "Something Left Out" by Ben Ciscel (Feedback, July 1992). Sorry if Ben or anyone else misunderstood the compatibiity of Harrison's Word Processor for the TI99/4A. In my MICRO-Review columns, I state in the "system requirements" whether or not a program will work with the Geneve. If the program is compatible with both the TI and the Geneve, I will state: "System requirements are Geneve 9640 or TI99/4A, 32K memory ..." etc. If it is compatible with the TI99/4A only, I will make no mention of the Geneve. Thank you for bringingthe subject up so that others will better understand my column.

Stan Krajewski
Live Oak, Florida

'Standard levels' of TI

On page 14 of the March 1992 issue I found an article about the stndards of TI99/4A home computers. You know, I have a Myarc Geneve 9640. Okay, that is not a TI, but I think this computer has a place in this list. On principle — so I think — my system is a "Level 4" system without 128KCPU-RAM which must be bankable on address >6000. So, where is the place of the Geneve in the list?

Martin Zeddes
Wolfsburg, Germany

As you probably saw in our July issue, the Geneve was included as "Level E" in the revised hardware standards list released by the National Committee for TI Standards — Ed.

***Feedback is a reader forum. The editor may condense excessively lengthy submissions if necessary. We ask that writers limit themselves to one subject per submission. Send items to* MICROpendium Feedback, P.O. Box 1343, Round Rock, Texas 78680.**

READER TO READER

Sam Carey, 5820 SE Westfork St., Portland, OR 97206-0742 writes:

I would like to know how to obtain the TM59995 or TM599105 microprocessors, or data books or data sheets for them. I have written to Texas Instruments numerous times, and they haven't given me any valuable information.

And, second, will someone please send me a *specific* schematic diagram showing how to decode the 16 CRU peripheral spaces, as I learn best from examples.

Bruce Campbell, 107 Kylie Ave., Ferny Hills, QLD, Australia 4055, writes:

Recently I purchased a sidecar RS232 module (PHP1700) and a TI-Phone Modem (PHP1600). Both of these use 115VAC. I need to find out the internal voltages (at the power boards) used so that I can convert them to 240VAC. If anyone has one or both of these devices, could you write or phone +61-07-3513107.

R.W. Zink, 4217 Molokai Dr., Naples, FL 33962, writes:

Recent disks of the months from two user groups featured several fast copiers for the CorComp Controller — Rediskcc v1.1, Ultra/cc, Masscopy, Turbo, et al.

They all locked up at the second screen instruction, "Press C to Continue"; although, surprisingly, Rediskit actually did continue on two separate occasions. When I mailed the requested fee to James Schroeder some time ago, I asked for further instructions for the CC. The TI Controller for SSSD worked fine on my backup. *No response.*

Researching MICROpendium, I found in the November 1984 issue that the head step time on the CorComp Controler was changed from 10 to 15 milliseconds. However, John Paine, no address, *reduced* his card to 3ms.

Before I tear apart my PE-Box to adjust the CC card, there must be someone out there who left his CC as it was originally set, 10ms. How did you get fast copiers to work?

Please, let's have some uniformity standards established quickly.

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.

BASIC

Pivot circles

By REGENA

Years ago, when my husband was a young boy baling hay, he tried to make the day more interesting by doing calculations. He would count bales per border as he was working and estimate tons per border. He would keep track of how many bales he had made and approximately how many would be on the whole field. He would also calculate bales per hour and tons per hour. Calculations were relatively easy because they had rectangular alfalfa fields.

```
7 TOWERS
360 DEGREES

RING  DISTANCE   AREA     ACRES   CUMULATIVE   % OF PIVOT
  1      157     77437     1.8       1.8            1
  2      157    232311     5.3       7.1            6
  3      157    387185     8.9      16.0           13
  4      201    721758    16.6      32.6           26
  5      201    975605    22.4      55.0           44
  6      201   1229451    28.2      83.2           66
  7      201   1483298    34.1     117.2           93
  8       44    358568     8.2     125.5          100
```

You may have noticed the rectangular fields are disappearing and circular pivots have replaced the ground irrigation systems. In fact, if you fly across the farmlands, you will notice all sizes of circles instead of the former rectangles. My father-in-law recognized that relatively maintenance-free pivots would be efficient, and his farm was among the first in the valley to convert to pivots.

For you non-farmers, a pivot sprinkler is simply a long pipe with sprinklers. The long pipe is held up with towers on wheels that make the pipe rotate around a base point. Watering is thus done in a circle. The wheels mark off concentric circles, and harvesting is then done in circles between the wheel ruts.

Our family has enjoyed having the pivots, but my husband says you have to get used to thinking in circles rather than rectangles. They also no longer bale hay but chop the hay, which is then cubed and sold. My husband still likes to do calculations but says figuring in circles is more difficult and harder to estimate. An area of a rectangle is simply length times width, but the area of a circle is pi times radius squared. As you work in concentric circles, the area varies as the distance-squared from the pivot base.

The program this month does some of those calculations that you might want as you are farming. As you are cutting in rounds, you may want to calculate the acres cut and what percentage of the whole pivot is completed (or how many acres are left to do). We have a couple of sons helping their dad cut and chop, and they may work on different rounds or rings. This program could help them figure how many acres are in the rings they are doing. The "rings" are usually labeled as "wheels" or "towers."

This program first asks for the number of towers in the pivot. For an example, we will use a seven-tower pivot. The distance between towers is not always the same, so the computer next asks for the distances (in feet) between towers, starting at the center base. In our example, the first tower is 157 feet from the center. The second and third towers are also 157 feet. Then there are four towers at 201 feet each.

After the last tower, there is a boom cantilevered outward with an end gun that can extend the watering. The end gun may be turned on or off. For simplicity in this example, we will assume the end gun is off all the time and the boom waters an additional 44 feet. The computer asks for the distance from the last tower to the edge of the field. This would be the distance from the last tower to the edge of the watered field, which may include the area an end gun waters.

The next question asked is how many degrees are used. In a full circle pivot, there would be 360 degrees. We also have a half pivot, which would be 180 degrees. We are planning a 13-tower pivot to be put in later this year, and it may be about 190 degrees — a half pivot with a little extension on each end. However, we can probably purchase only enough water to do part of the pivot — a pie-shaped section of perhaps 55 degrees. With a computer program we can choose several options and see how the acres work out.

The next option is whether you want a printed copy or not. If you do have a printer connected and want a printed copy, enter your printer configuration, such as RS232.BA=600. The computer will then OPEN #1 with that configuration and later use PRINT #1 to print the data.

The calculations are then printed on the screen (and printer if so chosen). For each ring, the area is calculated in square feet, then acres. CUM is the cumulative area in acres, and % is the percentage of the whole pivot at that point. On the printed copy you will also get the ring number and the distance or width of that ring.

This program may be adapted for any calculations involving concentric circles, not necessarily pivots. You may take out the lines referring to acres and just use square units of whatever the distances are that you enter.

Lines 170-380 define graphic characters and colors and draw the circle on the screen. The string variables in Lines 1060-1190 are used to line up the printing. PR=0 if you have not chosen a printer, and PR=1 if you do want printing. The area has been rounded to the nearest integer, and the acres are rounded to the nearest tenth. The rounding is not done until just before the printing, so sometimes the acres and cumulative may not look right. However, the printing is facilitated by rounding, so there is a trade-off.

If you would like 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.* Please specify that you need PIVOT for the TI and whether you want cassette or diskette.

(Program begins on Page 8)

REGENA ON BASIC —

```
100 REM PIVOT CIRCLES !145
110 REM BY REGENA !071
120 DIM C(16),D(16)!000
130 DEF PI=3.14159 !020
140 CALL CLEAR !209
150 CALL SCREEN(8)!153
160 PRINT "    ** PIVOT CIRCL
ES **": : : :!076
170 FOR J=96 TO 133 !224
180 READ C$ !254
190 CALL CHAR(J,C$)!088
200 NEXT J !224
210 DATA FFFFFFFFFFFFFFFF,00
0001071F3F7FFF,073FFFFFFFFF
FFF,E0FCFFFFFFFFFFFF,000080E
0F8FCFEFF !161
220 DATA 0103070F0F1F1F3F,FF
FFFFFEFDFBF7EF,FCE39F7FFFFFF
FFF,00FFFFFFFFFFFFFF,3FC7F9F
EFFFFFFFF !236
230 DATA FFFFFF7FBFDFEFF7,80
C0E0F0F0F8F8FC,3F3F7F7F7FFFF
FFF,EFDFDFBFBFBF7F7F,FFFCF3E
FDFDFBFBF !014
240 DATA FF3FCFF7FBFBFDFD,F7
FBFBFDFDFDFEFE,FCFCFEFEFEFFF
FFF,7F7F7F7F7F7F7F7F,FFFFFFE
7E7FFFFFF !134
250 DATA FEFEFEFEFEFEFEFE,FF
FFFF7F7F7F3F3F,7F7FBFBFBFDFD
FEF,BFBFDFDFEFF3FCFF,FFFFFFF
FFFFFFFF,FDFDFBFBF7CF3FFF !24
6
260 DATA FEFEFDFDFDFBFBF7,FF
FFFFFEFEFEFCFC,3F1F1F0F0F070
301,EFF7FBFDFEFFFFFF,FFFFFFF
F7F9FE3FC !035
270 DATA FFFFFFFFFEF9C73F,F7
EFDFBF7FFFFFFF,FCF8F8F0F0E0C
08,FF7F3F1F0701,FFFFFFFFFFFF
3F07,FFFFFFFFFFFFFCE !020
280 DATA FFFEFCF8E08 !049
290 FOR J=9 TO 13 !117
300 CALL COLOR(J,13,1)!046
310 NEXT J !224
320 PRINT TAB(11);"ab`cd" !1
55
330 PRINT TAB(10);"efghijk"
!138
340 PRINT TAB(10);"lmnhopq"
!177
350 PRINT TAB(10);"`rrstt`"
!177
360 PRINT TAB(10);"uvwxyz{"
!250
370 PRINT TAB(10);"|}~x"&CHR
$(127)&CHR$(128)&CHR$(129)!1
93
380 PRINT TAB(11);CHR$(130)&
CHR$(131)&"`"&CHR$(132)&CHR$
(133)!123
390 PRINT : : :!187
400 INPUT "NUMBER OF TOWERS:
 ":N !074
410 IF (N>0)+(N<16)=-2 THEN
440 !017
420 PRINT :"NUMBER OF TOWERS
 MUST BE    FROM 1 TO 15.":
:!185
430 GOTO 400 !224
440 N=INT(N)!150
450 PRINT : :"ENTER DISTANCE
S IN FEET": :!133
460 INPUT "CENTER TO TOWER(1
): ":D(1)!222
470 IF D(1)>0 THEN 500 !086
480 PRINT :"MUST BE GREATER
THAN ZERO": :!096
490 GOTO 460 !028
500 TT=D(1)!017
510 C(1)=PI*TT*TT !215
520 IF N=1 THEN 620 !113
530 FOR J=2 TO N !142
540 PRINT "TOWER(";STR$(J-1)
;") TO TOWER(";STR$(J);")";!
014
550 INPUT D(J)!141
560 IF D(J)>0 THEN 590 !001
570 PRINT :"MUST BE GREATER
THAN ZERO": :!096
580 GOTO 540 !109
590 TT=TT+D(J)!202
600 C(J)=PI*TT*TT !039
610 NEXT J !224
620 PRINT : :"DISTANCE FROM
LAST TOWER" !137
630 INPUT "TO EDGE OF FIELD:
 ":D(N+1)!069
640 IF D(N+1)>=0 THEN 670 !2
06
650 PRINT :"MUST BE GREATER
THAN OR     EQUAL TO ZERO" !
162
660 GOTO 620 !189
670 TT=TT+D(N+1)!137
680 P=PI*TT*TT !125
690 C(N+1)=P !199
700 PA=P/43560 !050
710 PRINT : : :"HOW MANY DEG
REES ARE USED?" !134
720 PRINT :"FOR EXAMPLE, A F
ULL PIVOT   IS 360; A HALF P
IVOT IS 180.": :!064
730 INPUT "DEGREES: ":DEG !0
64
740 IF (DEG>0)+(DEG<=360)=-2
 THEN 770 !082
750 PRINT :"PLEASE USE FROM
1 TO 360" !024
760 GOTO 710 !023
770 FR=DEG/360 !078
780 PRINT : :"WANT A PRINTED
 COPY?  (Y/N)" !186
790 PR=0 !089
800 CALL KEY(3,K,S)!190
810 IF (K=78)+(K=110)THEN 87
0 !169
820 IF (K<>89)+(K<>121)=-2 T
HEN 800 !100
830 PR=1 !090
840 PRINT :"ENTER YOUR PRINT
ER":"CONFIGURATION.": :!085
850 INPUT C$ !249
860 OPEN #1:C$ !178
870 CALL CLEAR !209
880 TA=0 !076
890 C(0)=0 !096
900 PRINT N;"TOWERS" !079
910 PRINT DEG;"DEGREES": : :
!012
920 IF PR=0 THEN 950 !015
930 PRINT #1:TAB(5);N;"TOWER
S" !022
940 PRINT #1:TAB(5);DEG;"DEG
REES": : :!211
950 PRINT "    AREA   ACRES
 CUM   %": : :!172
960 IF PR=0 THEN 980 !045
970 PRINT #1:TAB(5);"RING  D
ISTANCE   AREA     ACRES
 CUMULATIVE     % OF PIVOT":
 : :!147
980 FOR J=1 TO N+1 !072
990 AREA=(C(J)-C(J-1))*FR !0
17
1000 AC=INT((AREA/43560+.05)
*10)/10 !147
1010 TA=INT((C(J)*FR/43560+.
05)*10)/10 !224
1020 IF J<N+1 THEN 1050 !045
1030 PER=100 !001
```

(See Page 9)

EXTENDED BASIC (plus)

Sex and Extended BASIC

By BARRY TRAVER
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How's that for an interesting headline, to get things started? I hope you won't be disappointed when I admit that my actual intention is exploring a mental difference (real or supposed) between the sexes rather than a possible physical activity that, say, a husband and wife might do together in view of the fact that there is a difference between the sexes (and, as the French say, "Vive la difference!"). In the battle between the sexes, there are many areas of contention and many examples of "fightin' words." Here's one more: can women be as good at BASIC programming as men?

The reason why we have many more men BASIC programmers than women BASIC programmers is that women are better at verbal stuff and men are better at mathematical stuff, and everyone knows that programming is consequently a male-oriented activity, right? Not necessarily!

Yes, there is some evidence for the verbal/math distinction between the sexes, in whatever way it might be explained. (Some people argue that the reason more women aren't better at math is that girls at taught at an early age that being good at math is not a "feminine" thing to be, while other people argue that there are also some demonstrable differences in right/left brain development between the sexes.)

Whether it be explained as a matter of environment or as a matter of genetics, perhaps we may concede that in general such a difference (that is, that men may tend to be better with math and women may tend to be better with words) may have some validity at the present time (although that, of course, would say nothing about individual men and individual women, any more than the fact that men tend to be taller than women would necessarily mean that any particular man is thereby taller than an particular woman). If we grant (even merely for the sake of argument) this math/verbal difference, however, what implications would that have for BASIC programming?

Personally, I believe that women - in general and in particular - are as well equipped to be good programmers as men, if not better. BASIC, assembly, C, etc., are programming languages, and the linguistic nature of programming suggests, if anything, that women may have a natural advantage in this realm. I've done a lot of BASIC programming, I've looked at a lot of programming by other men, and I have to admit that math doesn't play a large role in most programs. Rather, rules of grammar and syntax (again, BASIC is a language, remember) appear to be much more important. Yes, we've got some excellent men programming in Extended BASIC, but we've got some excellent women as well. If we have a Jim Peterson to boast of, we have a Cheryl Whitelaw (Regena) also.

DEDUCTIVE AND INDUCTIVE WAYS TO LEARN A LANGUAGE

I will be returning in a moment to the topic of women programming in Extended BASIC, but first let's think a bit more about learning languages, since XB is indeed a language. In my lifetime I've had a smattering of quite a few languages (including Anglo-Saxon, Dutch, French, German, ancient Greek, Hebrew, and even Esperanto), and there are essentially two basic approaches to learning a language: (1) deductive (where you start with the formal rules and vocabulary lists) and (2) inductive (where you start with specific passages written in the language).

What is true of learning foreign languages is true of learning programming languages. Although the deductive approach has its usefulness, I believe that I have learned more about XB programming through the inductive approach, i.e., looking at, carefully considering, playing around with, and changing specific examples of good BASIC programs. (Maybe the reason learning assembly is so hard for many people is that the assembly books - with the possible exception of the one by Peter Lottrup - tend to be deductive rather than inductive.)

When I was a college English teacher, I told my students, "One of the best ways to learn how to write well is to read lots of examples of good writing." The same holds for learning XB programming: if you really want to be a good XB programmer, then read lots of good XB programs by good XB programmers! You already know about Jim Peterson and "Regena"; you may not, however, yet know about another person I would highly recommend....

LUCIE DORAIS AND FAST XB

One of the best-kept secrets in the TI

(See Page 10)

REGENA ON BASIC—

(Continued from Page 9)

```
1040 GOTO 1060 !119
1050 PER=INT((TA/(PA*FR)+.00
5)*100)!111
1060 A$=STR$(INT(AREA))!192
1070 AC$=STR$(AC)!050
1080 IF POS(AC$,".",1)>0 THE
N 1100 !074
1090 AC$=AC$&".0" !237
1100 TA$=STR$(TA)!084
1110 IF POS(TA$,".",1)>0 THE
N 1130 !121
1120 TA$=TA$&".0" !015
1130 PER$=STR$(PER)!248
1140 PRINT TAB(10-LEN(A$));A
$;TAB(16-LEN(AC$));AC$;TAB(2
2-LEN(TA$));TA$;TAB(27-LEN(P
ER$));PER$ !155
1150 IF PR=0 THEN 1200 !010
1160 J$=STR$(J)!190
1170 D$=STR$(D(J))!105
1180 PRINT #1:TAB(9-LEN(J$))
;J$;TAB(17-LEN(D$));D$;TAB(2
8-LEN(A$));A$;TAB(36-LEN(AC$
));AC$;!253
1190 PRINT #1:TAB(48-LEN(TA$
));TA$;TAB(63-LEN(PER$));PER
$: :!153
1200 NEXT J !224
1210 IF PR=0 THEN 1230 !040
1220 CLOSE #1 !151
1230 END !139
```

EXTENDED BASIC PLUS—

(Continued from Page 9)

world (at least outside of Canada) seems to be the programming (and teaching) talents of Lucie Dorais, whose "Fast Extended BASIC" column in the Ottawa TI-99/4A Users Group newsletter has for years provided a rich resource for those interested in XB programming. Lucie is an example of a woman with linguistic ability: she speaks at least three lanugages fluently: English, French, and Extended BASIC! I don't know whether past issues of the Ottawa newsletter are available, but I do know that Lucie's XB programs/tutorials are still available!

Here's the good news, in Lucie's own words (from a personal note that I received from her recently on GEnie, after I requested the information for this column): "As for my XB programs: there are now five volumes out, each with complete text of my monthly column (minus the listings) and with the actual programs. This year's volume (5) has two solitaire games, Canfield and Monte-Color (for children), an "educational" game for very young children to learn about Traffic Lights, two more games (Onecheck, a kind of checker solitaire, and Boomerang, copied from an old French TI magazine... I had run out of ideas that month...), and a utility to convert Roman numerals. The most interesting programs are the ones I did last: a set of program and data files to learn and play with 100 words in five languages! To order, write to Dave Morrison, Librarian, Ottawa TI Users' Group, 3489 Paul Anka Drive, Ottawa, Ontario, Canada K1V 9K6. Price, each volume: $3 for the DSSD (one vol=one disk), $4 for two SSSDs (one vol=two disks), plus postage, about $4 for US, depends on weight (how many disks)."

By the way, did you happen to notice the various references to languages in Lucie's comments? Have I proved the point I argued earlier about language abilities and learning a programming language? Whether or not I've persuaded you of that point, I hope I've convinced you that you ought to take advantage of Lucie's XB programs/tutorials. At that bargain price, why not order all five volumes (including appropriate postage)? I don't think you'll regret it!

TRIMMING SUBPROGRAMS

Speaking of XB programs, it's about time for us to stop talking about XB programming and getting down to some specific programming here. I mentioned a while back that QuickBASIC for the IBM-PC has two useful string-handling commands, LTRIM$ and RTRIM$, which can be used to trim off leading and trailing blanks at the end of a string. Well, it's easy for us to add the same option to TI Extended BASIC, as the following demo program demonstrates:

```
100 ! TRIM DEMO - (C) COPYRI
GHT 1992 by Barry Traver
110 DISPLAY ERASE ALL :: PRI
NT "TRIM DEMO by Barry Trave
r"
120 PRINT :"Enter string wit
h leading ortrailing blanks:
"
130 LINPUT "":A$
140 PRINT :"ORIGINAL:":"""&
A$&""":"LENGTH =";LEN(A$)
150 CALL LTRIM(A$,B$)
160 PRINT :"LTRIM:":"""&B$&
""":"LENGTH =";LEN(B$)
170 CALL RTRIM(A$,B$)
180 PRINT :"RTRIM:":"""&B$&
""":"LENGTH =";LEN(B$)
190 CALL TRIM(A$,B$)
200 PRINT :"TRIM:":"""&B$&"
"":"LENGTH =";LEN(B$)
210 STOP
30000 SUB LTRIM(A$,B$)! (C)
COPYRIGHT 1992 by Barry Trav
er
30002 ! Purpose:  to trim le
ading spaces from a string.
30004 ! A$=input string, B$=
output string
30006 B$=A$ :: IF B$=RPT$("
",LEN(B$))THEN B$="" :: SUBE
XIT
30008 IF SEG$(B$,1,4)="    "
 THEN B$=SEG$(B$,5,LEN(B$)-4
):: GOTO 30008
30010 IF SEG$(B$,1,1)=" " TH
EN B$=SEG$(B$,2,LEN(B$)-1)::
 GOTO 30010
30012 SUBEND
30014 SUB RTRIM(A$,B$)! (C)
COPYRIGHT 1992 by B. Traver
30016 ! Purpose:  to trim tr
ailing spaces from a string.
30018 ! A$=input string, B$=
output string
30020 B$=A$ :: IF B$=RPT$("
",LEN(B$))THEN B$="" :: SUBE
XIT
30022 IF LEN(B$)>4 THEN IF S
EG$(B$,LEN(B$)-3,4)="    " T
HENB$=SEG$(B$,1,LEN(B$) -4):
: GOTO 30022
30024 IF SEG$(B$,LEN(B$),1)=
" " THEN B$=SEG$(B$,1,LEN(B$
)-1):: GOTO 30024
30026 SUBEND
30028 SUB TRIM(A$,B$)! (C) C
OPYRIGHT 1992 by Barry Trave
r
30030 ! Purpose:  to trim le
ading and trailing spaces fr
om a string.
30032 ! A$=input string, B$=
output string
30034 CALL LTRIM(A$,B$):: A$
=B$ :: CALL RTRIM(A$,B$)
30036 SUBEND
```

LINPUT A$ is much better than INPUT A$ if you are dealing with entry of strings containing commas, but LINPUT does have the disadvantage of allowing sometimes undesired blank spaces at the beginning and end of the string. The three subprograms here - LTRIM, RTRIM, and TRIM - give you quick control over such situation. If they're helpful to you, feel free to use these subprograms in your own XB programming.

Some notes: if you want to change the original string rather than create a new string, just eliminate the B$ and use just A$ instead. That is, instead of CALL TRIM(A$,B$), use CALL TRIM(A$,A$). I hope you have been building an expanding library of your own XB subprograms. If you decide to include these three subprograms, you should check the line numbers to make sure that there is no conflict with subprograms already in your library. (If there is, just use RES to resequence my subprograms appropriately before adding them to the collection you already have.)

It's a good practice in writing subprograms to include some remarks as to the purpose of the subprogram and the meaning of the variables used. Since the subpro-

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EXTENDED BASIC PLUS—

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gram name is limited as to how much it can tell you, you'll find such added remarks very helpful as your own XB subprogram library expands. If you have hundreds of XB subprograms to keep track of, without such help you will have trouble remembering what various subprograms do.

THE RICHES OF RICHGKXB

One way to expand the commands available to you in Extended BASIC is to add your own CALLs by way of writing subprograms in TI XB, as we have just seen. Another way is to add assembly subroutines, as my earlier column "BASIC Assembly" illustrated. (In this case, the new commands are accessed, of course, with a CALL LINK rather than a simple CALL.) A third way is to use new CALLs that someone else has added to Extended BASIC. One example of the third approach is "RICHGKXB," a product from CaDD Electronics, 81 Prescott Road, Raymond, NH 03077 (phone 603/895-0119 for current information on pricing, etc.).

I've written reviews of over a dozen "Extended Extended BASICs," but I think that this product is one of the best available. There is a catch, however: you do need a gram emulation device (e.g., Gram Kracker, Gramulator, P-Gram card, etc.) to use it. (Note: if you don't have one and want one, you can get a Gramulator from CaDD Electronics; write or phone them for further information). In fact, it's a further development of the expanded XB that Miller Graphics put out earlier for the Gram Kracker. This new, improved version was developed by Richard Lynn Gilbertson (hence the name "RICHGKXB").

It's a hard product to review, because Rich is continually adding new features (since the product is on disk, the contents are not "fixed" in the way that a physical module usually is), but I'll try to give you a brief idea of the "rich" resources here for you.

New CALLs include the following: BASIC (switches from TI XB to TI BASIC); DELAY; DUPCHAR, DUPCOLOR, SWAPCHAR, and SWAPCOLOR (used to duplicate or swap character definitions and color combinations); EAMENU, EAED, EAASS, EALR, and EAPGM (all related to calling Editor/Assembler, also available to you); GMOTION (new sprite command, opposite of MOTION); GWINDOW and WINDOW (ACCEPT AT and DISPLAY AT for windows); HFILL and VFILL (fill entire screen with character); HGET, VGET, HPUT, and VPUT (simplified horizontal and vertical versions for ACCEPT AT and DISPLAY AT); INIT2 (adds DSRLNK and GPLLNK to INIT); INITPDISK and PDISK (a Phoney DISK that uses lover 8K as disk drive), INVERSE (reverses foreground/background of character), LDIAG and RDIAG (diagonal versions of HCHAR or VCHAR); MOVE and MOVES (to give total control over all types of memory, including VDP RAM, CPU RAM, and GRAM), RMOTION (new sprite command, reverses direction of motion); and XBASIC (same as RUN "DSK1.LOAD").

The new CALLs are just part of the story. Older TI XB CALLs (e.g., COINC, DISTANCE, JOYST, KEY, MAGNIFY) have often been enhanced (by adding autorepeat, for example). Many commands are also available in combined form for speedier execution. (For instance, CALL SORM is a combination of CALL SOUND and CALL RMOTION.) The included NOPOWERUP program allows you to turn off XB's autostart feature (and POWERUP turns it on again). In short, with RICHGKXB you have all that you already have in TI Extended BASIC —plus— (which certainly makes it an appropriate subject for this column). If you write a lot of programs for yourself (or if you have a friends who own gram emulation devices), then CaDD's RICHGKXB should indeed be a "rich" resource. (By the way, I understand that a cartridge version of RICHGKXB is to be available from OPA sometime in the future, but I have no details concerning that at this time.) Try It - you'll —love— it!

Well, once again I'm out of TIme and space. Until next time, keep on compuTIn'!

THE ART OF ASSEMBLY - PART 15

Compatibility with the Geneve

By BRUCE HARRISON
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We have said this before, but let's just be sure our readers know at the outset of this article that we do not own a Geneve. We will, however, relate some of the compatibility problems we've encountered, and offer solutions to some, but not all.

In last month's article we discussed getting from an Option-3 program to an Option-5 environment, and one of the suggestions made was to capture the E/A utilities from low memory, embed them into a program's space, and then have the Option-5 program put them back in low memory when the program starts.

That process seems to help on the Geneve, especially if your program uses DSRLNK. In an earlier article, we showed the source code for a general purpose DSRLNK and GPLLNK to be used when programs had to load from Extended Basic. For reasons we've never pinned down, the DSRLNK given there will not always work on a Geneve. (The GPLLNK will.) If you have done the process described last month, however, your program will be using the E/A DSRLNK, and that seems to work just as well on a Geneve as on a TI.

In some of our programs, we have made the program able to load from either XB or E/A, but advised Geneve owners that only the E/A entry method will work on their machines. That seems

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ART OF ASSEMBLY—

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to be borne out by recent tests.

The other big problem that we encountered was that timing loops set up to run on the TI speed up considerably on the Geneve, even at its slowest clock rate. A customer named Aaron West, who owns both a Geneve and a TI, helped us find a solution to that problem, so that some of our Assembly music disks could be made so that the music would play at the same pace on either machine, and regardless of the clock speed setting on the Geneve.

From that experience, which took many mailings of disks between Maryland and Connecticut, we were able to devise a fairly efficient way of calibrating timing loops for the faster Geneve. This month's sidebar shows our Calibrate routine, which measures the speed of the computer it's running on and then allows us to modify the timing loop counts in the program. This process will also work for "bus" modified TI consoles, in which the 32K memory works on a 16-bit basis, and so executes much faster than the normal 32K expansion.

Our friend Dan Eicher ran some benchmark tests using this calibration code, and found that the numbers tracked accurately on all three systems (normal TI, BUS modified, and Geneve).

We suspect that some of what we've done may not work all that well for the proposed TI Accelerator, because the speed difference may be more than we can handle. The problem occurs not in the calibration run itself, but in the multiply and divide operation that's necessary for adjusting loop counts. If the ratio between the TI speed and that of the running machine is too great, then the results of the divide operation will not fit in a 16-bit word, resulting in an unrecoverable error condition.

We ran into this particular problem when trying to make our Assembly music work on Tandy computers. Most of the Tandy PCs would handle it just fine, but we discovered that some of their newer ones were so much faster than our 1000SX that a "divide overflow" error would happen on long-duration notes, stopping the PC dead. The divide overflow won't stop the Geneve or TI, but timing loops can still go crazy.

The source code shown in the sidebar uses the CRU clock, which runs at the same rate on either TI or Geneve, and so gives us a "constant" by which to measure the execution speed of the machine we are running on. The code as shown provides a complete Option 3 E/A program that will run a test for you and display results on the screen. When integrating this into a program of your own, you would omit all the code beginning at label DISPLY, the two lines immediately following label CALIB, and all the data except labels CALNUM and TINUM.

In essence what happens here is that we load up a count into the CRU, turn on the CRU clock, and then

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Sidebar 15

```
* CALIBRATION - MEASURES EXECUTION SPEED OF THE MACHINE THIS RUNS ON
* CODE BY BRUCE HARRISON
* PRINTS NUMBERS ON-SCREEN FOR EXAMINATION
* TOP NUMBER IS FOR CURRENT MACHINE, BOTTOM NUMBER IS FOR STANDARD TI-
99/4A
* RELEASED TO PUBLIC DOMAIN
*
GPLWS   EQU   >83E0       GPL WORKSPACE
STATUS  EQU   >837C       GPL STATUS BYTE
WS      EQU   >20BA       USER WORKSPACE
KEYADR  EQU   >8374       KEY-UNIT ADDRESS
KEYVAL  EQU   >8375       STRUCK KEY VALUE ADDRESS

        REF   VSBW,KSCAN  REFERENCED UTILITIES
        DEF   CALIB       DEFINE OUR ENTRY POINT
CALIB
        MOV   R11,@>8300  STASH RETURN ADDRESS
        LWPI  WS          LOAD USER WORKSPACE
        CLR   R12         SET CRU BASE 0
        SETO  R3          SET R3 TO ONES
        LDCR  R3,15       PUT 15 BITS INTO CRU
        SBZ   0           ACTIVATE CRU CLOCK
        LI    R4,50       DELAY COUNT
DLY
        CLR   R5          ALL THIS JUST
        LI    R6,>FFFF    KILLS SOME TIME
        LI    R9,256      UNTIL WE READ
        DIV   R9,R5       THE CLOCK
        DEC   R4          DECREMENT LOOP COUNT
        JNE   DLY         IF NOT ZERO, REPEAT LOOP
        CLR   R12         SET CRU BASE 0
        SBO   0           STOP CRU CLOCK
        STCR  R3,15       GET 15 BITS INTO R3
        CLR   R12         ZERO CRU BASE
        SBZ   0           RE-ACTIVATE CLOCK
        ORI   R3,>8000    MAKE NEGATIVE VALUE3
        SRA   R3,1        CUT VALUE IN HALF
        INV   R3          INVERT ALL BITS IN R3
        MOV   R3,@CALNUM  STASH AT CALNUM
        MOV   @CALNUM,R5  PUT IN R5
        LI    R0,11*32+16 SET SCREEN LOCATION
        BL    @INTDIS     DISPLAY INTEGER
        AI    R0,64       MOVE DOWN TWO SCREEN LINES
        MOV   @TINUM,R5   PUT TINUM IN R5
        BL    @INTDIS     DISPLAY THAT
KEY     CLR   @STATUS     THIS SECTION
        BLWP  @KSCAN      SIMPLY WAITS FOR
        CB    @ANYKEY,@STATUS     A KEY TO BE PRESSED
        JNE   KEY         ELSE REPEAT SCAN
        LWPI  GPLWS       GET BACK TO GPL WORKSPACE
        MOV   @>8300,R11  PUT R11 VALUE BACK
        CLR   @STATUS     CLEAR STATUS
        RT                RETURN
INTDIS
        LI    R14,INTSTK  POINT R14 AT STACK
INTLOP  MOV   R5,R6       PLACE R5 NUMBER IN R6
        DEC   R0          DECREMENT R0
        CLR   R5          CLEAR R5
        DIV   @TEN,R5     DIVIDE BY TEN
        SWPB  R6          GET REMAINDER IN LEFT BYTE R6
        AB    @NUMBER,R6  ADD NUMBER MASK
        MOVB  R6,*R14+    STASH ON STACK (LEAST SIGNIFICANT DIGIT FIRST)
        MOV   R5,R5       IS R5 0 YET
        JNE   INTLOP      IF NOT, GO BACK
DISLOP  DEC   R14         POINT TO MOST SIGNIFICANT DIGIT FIRST
        MOVB  *R14,R1     MOV IT TO R1
        BLWP  @VSBW       WRITE DIGIT TO SCREEN
        INC   R0          MOVE ONE CHARACTER ON SCREEN
        CI    R14,INTSTK  ARE WE AT BEGINNING
        JGT   DISLOP      NO, GO BACK FOR NEXT DIGIT
        RT                FINISHED, RETURN
INTSTK  BSS   5           FIVE DIGIT MAX INTEGER (65535)
TEN     DATA  10          THE NUMBER 10 AS A WORD
NUMBER  BYTE  >30         HEX FOR ZERO CHARACTER
ANYKEY  BYTE  >20         SPACE CHARACTER
CALNUM  DATA  0           DATA FOR NUMBER FOUND
TINUM   DATA  199         NUMBER THIS YIELDS ON A TI
        END
```

ART OF ASSEMBLY—

(Continued from Page 12)

run a time-wasting loop 50 times before we stop the CRU clock. Our loop has taken some amount of time, which will differ by the speed of the computer, while the CRU clock has provided us an invariant time measuring count. When we stop the CRU clock and recover the count left in the CRU, we have a measure of the speed at which that 50-times loop repetition occurred. On a standard TI, the count we report out to CALNUM will be 199, just like the constant value we have used at TINUM. On a Geneve, that number reported to CALNUM will always be less than what we got on the TI.

As we mentioned, Dan Eicher was able to get access to a TI, a bus-modified TI, and a Geneve for testing this routine. The resulting CALNUM values he got were:

STANDARD TI - 199 (of course)
"BUS" TI - 139
GENEVE - 48

Dan also ran a slightly modified version of this routine. He changed the Workspace to >8300, so that the registers used in the delay loop would be accessed as 16-bit words. That made no difference on the Geneve or the Bus Modified TI, but changed the number to 165 on a standard TI. This tells us that the Geneve, like the Bus Modified TI, has a 16-bit path to its 32K memory as well as to CPU RAM PAD. We learn something every day in this business!

Now a little honest confession from your Assembly columnist: I don't really know for certain how this works. Aaron West knows, I think, but his explanation to me wasn't exactly clear. What I do know is that this works, and I have annotated the source code in the Sidebar to indicate how I think it works, but please don't accept the annotations as Gospel.

Once the number CALNUM is established, we can use it to modify the delay-loop counts in our program, so the actual time delays these loops provide will be nearly constant regardless of the machine they run on. Now let's suppose that you have a delay loop count value built into your program somewhere like this:

```
DLYCNT    LI    R4,>0200
```

To fix that up for another machine, you have to do something like this:

```
CALDLY    MOV   @DLYCNT+2,R7
          MPY   @TINUM,R7
          DIV   @CALNUM,R7
          MOV   R7,@DLYCNT+2
```

Let's examine this one line at a time. The first line gets the immediate value used for the delay loop into Register 7. Next, we multiply by the number at TINUM (199). The result will be some number in the R7-R8 register pair. Now we divide that number by CALNUM. If we are on a standard TI, we just multiplied and divided by the same number, so R7 will contain the original immediate value. If we are on a Geneve, and CALNUM is therefore 48, we will divide R7-R8 by that smaller number, so R7 will contain >084A after the division. Thus when we move this number from R7 back into the immediate value location, the delay loop, when it executes, will execute more than four times as many passes though the loop. Thus the timing of the actual loop will be compensated for the speed of the machine, so the time delay imposed will be about the same as on the original TI for which the program was developed. Of course this correction of the timing count will have to be done early in the execution of your program, before the timing loop itself has to execute. Our practice has been to do the calibration part at the very beginning of the program, then do the Multiply and Divide operation for each timing constant immediately after CALIB, thus doing these things before any of the delay loops executes.

As we understand it, the Geneve can be run at different speeds by changing the setting of its CPU clock. People who have tried out some of our music that was made Geneve Compatible have reported that this made no difference whatever in the tempo of the music. It should not, therefore, make any difference in the performance of the calibration business we just covered, except that the numbers we've shown in our example would be different, but with the same self-regulating result.

Somehow you all knew there would be some words of caution coming here, and you were right! The delay counts that you start with have to be set up so that they won't "overflow" when the multiply and divide operation are performed. In the previous example, we started with number >0200 for our delay loop on the TI. That's a safe number, in that even if it got multiplied by ten in the calibration process, it would still be only >1400, well short of the limit (>FFFF) before causing an overflow condition. Without having a Geneve to run exhaustive tests on, we can only guess at what the actual limits are. In our previous example, where the Geneve was running slightly over four times the TI speed, we could have started with >3DBF in the delay loop and not encountered an overflow. What we recommend, without being overly cautious, is that the original delay loop counts be kept to >2000 or less, so that no risk of overflow is present.

Suppose >2000 does not give you enough delay? You could always make a nested loop for the delay, such as this:

```
DLYCNT    LI    R5,4
SECOND    LI    R4,>2000
DLYLOP    SRC   R15,15
          SRC   R15,1
          DEC   R4
          JNE   DLYLOP
          DEC   R5
          JNE   SECOND
```

Please note that in this case you would modify the immediate value at SECOND+2 through that multiply and divide operation, and that the outer loop count (4, in this case) would not be modified for this nested situation.

The advent of the Accelerator will put a whole new wrinkle into all of our calculations. It's reported to multiply the inherent CPU speed on the TI by ten. In that delay loop situation we just covered, the starting value for the count would have to be below >1999 (>FFFF divided by ten) in order to avoid overflow. We suspect that using the Accelerator may make many pieces of existing software unusable. Anything involving timing loops will execute much too fast to be manageable. We don't plan on modifying our TIs that way.

There is of course another whole approach to timing loops, in which one uses the VDP Interrupt Timer to perform delay timing.

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ART OF ASSEMBLY—

(Continued from Page 13)

This is a convenient way around the whole problem, assuming that counting by 60ths of a second gives accurate enough results. This could become the topic for a whole article, but let's just give a quick example of how this can be made to work. Let's assume you want a two second delay for the user to see something on the screen. The delay loop could be constructed like this:

```
        CLR   @>8378
DLYLOP  LIMI  2
        LIMI  0
        MOV   @>8378,R4
        CI    R4,120
        JLT   DLYLOP
```

The instructions LIMI 2 and LIMI 0 are very important in this particular case, because without those, this becomes an infinite delay. The loop will continue to execute until the VDP Interrupt counter at >8378 becomes equal to or greater than 120, which makes the overall delay 120 60ths of a second, or in simpler numbers, two seconds. This same technique can be applied for other delay amounts just by changing the number in the CI statement. Three seconds would require CI R4,180, and so on. The number is limited to 255, and that would give a delay of 4.25 seconds. If longer delays are needed, the loop could be nested as shown above.

We hope this column has shed some light into the dark corners. We realize that there are some wonderful things that can be done with a Geneve that could not be done on a TI, but our focus is of necessity on the things that won't work the same on the Geneve. It appears that, over time, Geneve owners are finally getting software written just for their machines, and that's a hopeful sign. If Geneve owners have enough Geneve-exclusive software, they won't have to worry about trying to run stuff written for the TI on their machines.

Next month's topic is still undecided at this writing. We are writing these many months ahead of publication, and watching Reader Feedback every month for questions or comments from our readers, which we'll try to handle in future columns.

Video to promote FestWest 'North' '93

A video promoting FestWest "North"' '93, to be held Feb. 13-14 in Salt Lake City, Utah, is planned for distribution to user groups, according to Richard Paul Phillips, advertising director for the event.

Phillips, a director at a commercial television station, says the video will feature merchandise from TI vendors who register and send promotional materials. He says promotions including direct mailings to user groups will begin as soon as enough premier TI vendors have committed to attend.

For information, contact the FestWest North '93 Committee, 1396 Lincoln, Apt. B, Ogden, UT 84404, or phone (801) 393-9605 or (801) 894-6815 (voice) or (801) 394-0064 (BBS).

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Mike Wright seeks feedback, support for PC emulator of TI99/4A

By MIKE WRIGHT

It will soon be 10 years since Texas Instruments withdrew from the home computer market. From a development point of view, the only nearly viable upgrade to the 99/4A was the Geneve from Myarc. However, a recent announcement showed that the Geneve will almost certainly never reach the potential it could have.

So where does that leave TI users? Well, the one certainty is that our hardware is aging and, even though TI built the machine to seemingly military standards, one day it will no longer be operable. You will then have a perfectly good software library that has no further practical value.

There is a way out of this dilemma that also solves in one fell swoop many of the problems in the TI world. The answer is to develop a software emulator of the 99/4A that runs on another computer.

Recently I was a victim of the recession. By coincidence, a friend of mine was in the same boat. He is one of the best C programmers I have ever worked with. One day we were idly chatting about possible projects and I mentioned the wonders of the 4A and how I would like to see it run on a PC. He looked at me and said that it would be fairly easy to do. In fact, he had already worked on similar projects and had solved most of the typical emulator problems.

After a range of emotions, including choking and sputtering, I threw down the gauntlet. Two weeks later we (make that he) had a true 99/4A emulator running on an IBM PC. The current version of the emulator is capable of loading TI BASIC, TI Extended BASIC, and the Editor/Assembler. The code really works.

SOFTWARE-BASED EMULATOR

It is important to understand what the emulator is. It is a program that runs under DOS on the PC and pretends that it is a 99/4A computer. The heart of the emulator is the 9900 processor emulator, which pretends that it is a 9900 processor. This means the emulator can directly read 9900 executable code and produce the same result as the 9900 processor. The emulator is capable of decoding all 69 of the 9900's instructions, and can operate in all addressing modes. Strange as it may seem, this was not the hardest part. That turned out to be the setting of the status register after each instruction. For example, is the carry bit set on an SLC, and so on.

Since you are emulating a 9900 (and the 99/4A) this means that all calculations performed by the emulator return the same result as the 4A. You may know that IBM's BASICA is not as accurate as TI's BASIC. However, the emulator gives exactly the same result as a real 4A. This actually proves that the PC is not such a bad machine after all, it is just rather sloppily programmed.

With the 9900 emulator in place, attention was turned to the 99/4A. Allowances had to be made for the fact that VDP memory wrapped to >0000 at >3FFF; that the 256 bytes of RAM at >8300 was shadowed at >8000, >8100, and >8200; that most memory addresses in the range >8000 through >9FFF are memory mapped ports used for VDP accesses, GROM accesses, speech and sound; and that both GROM and VDP accesses are auto-incrementing. Not all of these problems have been resolved at present. For example, placing bytes at >8400 will not create a sound.

There is also no provision at present for any I/O to an external device. The memory map at >4000 is empty and so there are no DSRs. However, I am told, that all of this is possible and that it is only a matter of time.

Let us now look at what is required to run the emulator. You need an IBM PC with only 640K of RAM, a floppy drive, a hard drive of at least 20Mb, and a color VGA card and monitor. Later, it will be possible to use the PC's parallel and serial ports as if they are 4A ports.

ADVANTAGES

The advantages of the emulator are:

1. There is no need to deal with aging hardware. PC hardware has come down in price to the point where you can purchase a reasonable system for under $1,000. The PC hardware will be supported for the foreseeable future and is independent of

(See Page 18)

Early version encouraging

Mike Wright is (along with Bill Gaskill) well known as one of the chief historians of the TI community. He has recently released a TI "CYC" (or enCYClopedia), which is a book-length effort that is available in the Software Library for the TI RoundTable on GEnie. "Mike's CYC" deals primarily with the past (it is especially strong on the situation before TI's decision to stop production of the TI-99/4A), but Mike has recently made an announcement that shows that he is as much concerned with the future of the TI as with the past.

Mike's current project (which he is working on along with a PC programmer) is a PC emulator of the TI-99/4A. When/if completed, it will allow a PC to act as if it were a TI-99/4A. This project is not mere vaporware: I've run an early version of this program on my own PC. It gave me a TI title screen, allowed me to select Extended BASIC, and permitted me to do some simple TI XB commands. There is more work to be done, but what I have already seen (1) is more than I believed could be done and (2) presents hope for the future (if there is sufficient interest shown in the project for Mike and his friend Greg to be persuaded to follow through with it to the end).

I hope that many people will send the $1 requested, even in they only regard it as a "thank you" for the contributions Mike has already made to the TI community. The purpose of the money, of course, is not to provide reimbursement to Mike, but to allow him to notify you about the further progress of the project. I hope they will be encouraged to continue with their effort.

—Barry Traver

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

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

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

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

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

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Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

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

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

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

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

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

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

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

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

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

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

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

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

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

#56 SPREAD SHEET
(Ok, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59 GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Extasic and printer

#60. FRODDY
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way ;graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Extasic autoload.

#69. COMPUTER PLAYER PIANO/KEYBOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music

#73. CRYPTO (gram)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk

#77. MICRONEWS 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included

#78. ARTCOM+ BY RAY KAZNDER
ATTENTION GRAPHX AND TI ARTIST USERS!!!
This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (?) for converting from Artist to Graphx

#79. DMI000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80 BIRDWELL DISK UTILITY
A must if you are junto programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

#83. HOME APPLICATION PROGRAMS
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone

#84. GALACTIC BATTLE/SPY ADVENTURE
A pair of great text/graphical quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventuring game that will keep you guessing for hours.

#85. AUTOBOOT UTILITY
This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs, Editor Assembler programs and TI Writer files and run or display them all from exbasic.

#86. COLUMN TEXT III V3.2
A very useful utility for printing TI Writer and Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

#87. ARCHIVER III
This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files

#88. AUSSIE GAMES VOL 1
A collection of games from our friends down under. Includes a great card game and board game. Hours of fun and entertainment. Inc includes Matchmaker & TILO.

#89. PROCALC
This is an on screen calculator for decimal/hexidecimal conversions and much more. A must for the serious programmer.

 # 90. JET CHECKBOOK MANAGER
This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

#91. "THE MAZE OF GROC"(St. Valentine)
Ray Kazner has created a great maze game with fantastic graphics and the characters from this now legendary "Woodatock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY
Written by 99/4 programming great Charles Ehninger, this program originally sold for $59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE KBCB GIRLIE CALENDAR
This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knockout centerfold pinup for each month. If you like our #16 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

#94. GREAT 99/4A GAMES VOL. III
If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volumn is also filled with a collection of great ones!

#95. WEATHER FORECASTER
The weather predictions are amazingly reliable and accurate! A great game "lawnmower" and mini database are also included to make this disk a fantastic value.

#96. STATISTICS & SORTING
Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

#97. MEMORY MANIPULATOR
This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN
Two hilarious games (non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV
This disk features the works of J. Peter Hoddie. All of these games are of commercial quality and well worth the donation requested!

#100. ASSULT ON THE CITY (T. of DOOM)
An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE
This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Full documented.

#102. COLOSSAL CAVES ADVENTURE
This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

#103. SORGAN, THE 99/4A ORGAN
This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY
This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+
A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tigercub's Jim Peterson.

#106. QUEST (Dungeons & Dragons)
One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

#107. TI TRUMPET MUSIC ALBUM
Ken Gilliland's music and graphics version of the TV theme and the three motion pictures (Exbasic)

#108. FUNNELPLUS BY JACK SUCHROE
Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbelievable collection of fantastic aids to make the best even better!

#109 TI-WRITER MINI MANUAL
This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Instructions on using this powerful word processor are included.

#110. DISK + AID
A powerful disk sector editor formerly sold for $20. Menu driven and easy to use.

#111. POP MUSIC & GRAPHICS
This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

#112. INVOICE PACK
An excellent invoice preparation and printing program with instructions on how to modify it for your own business.

#113. LABEL MAKER 3
A collection of label programs to create mailing and disk envelopes, disk labels and much more!

#114. PANORAMA
A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist!

#115. GRAPHICS DESIGN SYSTEM
A complete system for creating graphic screens in full color for your programs by J. Peter Hoddie. Fully documented.

#116. FOURTH TUTORIAL
A lesson in FORTH programming on how to create graphics.

#117. UNIVERSAL DISASSEMBLER
This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

#118. FAST TERM
One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TI-II, ASCII, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A

#119. BAC LINKER
A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster and take up less space on disk. Full Doc

#120. BITMAC
The original BITMAC is now available at $6.95 with all original documentation. A powerful graphics program for the 99/4A that lets you print where you want ..even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A must for anyone into 99/4A graphics. Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

#121. SUPER YAHTZEE & WHEEL II
If you like Yahtzee this disk is for you. A great version written in high speed assembly. Also included is another version of Wheel of Fortune which also lets you create your own puzzles with a puzzle edit program included.

#122. ADULT ADVENTURE
A truly adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST COLD" which is one of the better ones we have seen recently.

#123. GREAT 99/4A GAMES, VOL V
THE FIFTH IN OUR BEST SELLING GAME COLLECTION SERIES. TWO DISK SIDES PACKED WITH TOP BEST!

#124. GREAT 99/4A GAMES, VOL VI
TWO MORE DISK SIDES FILLED WITH THE THE BEST GAMES AVAILABLE.

#125. BLACKJACK & POKER
A DISK BACKUP FOR MODULE OWNERS.

#126. VIDEO CHESS
A DISK BACKUP FOR OWNERS OF THE ORIGINAL MODULE. LOADS IN EXBASIC!

#127. PIX-GRAPHICS UTILITY
THIS IS THE FREEWARE VERSION OF JIM REISS' UTILITY THAT CAN DISPLAY TI-ARTIST, GRAPHX AND RLE GRAPHICS AND CONVERT FORMATS.

#128. TETRIS--THE SOVIET MIND GAME!
THIS INTERNATIONAL HIT IS NOW AVAILABLE FOR THE 99/4A. EXBASIC AUTOLOAD AND EASY TO USE INSTRUCTIONS.

#129. CASH DRAWER
A COMPUTERIZED CASH REGISTER PROGRAM WHAT PRINTS RECEIPTS, COMPUTES DAILY TOTALS AND EVEN FIGURES SALES TAX.

#130. THE ORGANIZER
THE ORIGINAL ORGANIZER PROGRAM WHICH LETS YOU ORGANIZE, SCHEDULE AND ARRANGE BUSINESS AND PERSONAL ACTIVITIES!

#131. CUMMULO CRAPS
THE BEST CASINO CRAPS GAME AVAILABLE FOR THE 99. COMES WITH FULL DOCUMENTATION.

#132. AMBULANCE
A DISK BACKUP OF THE ARCADE MODULE BY SUNNARE. LOADS IN EXBASIC!

#133. DRIVING DEMON
A DISK BACKUP OF THE ARCADE MODULE BY SUNNARE. LOADS IN EXBASIC!

#134. ROTO-RAIDER
A DISK BACKUP OF THIS HIT MODULE BY ROMOX. LOADS IN EXBASIC.

#135. ARCTURUS
A DISK BACKUP OF THE HIT SUNNARE ARCADE MODULE. IT'S ANSWER TO ZAXXON!

#136. ANT-EATER
A DISK BACKUP OF THIS HIT ROMOX MODULE

#137. CROSSFIRE
A DISK BACKUP FOR OWNERS OF THE ORIGINAL HIT ACTION MODULE FROM SIERRA ON LINE.

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#146. THE PRESIDENTS
A TI FIRST! THE BIOGRAPHIES OF EVERY U.S. PRESIDENT ON TWO DISK SIDES. GREAT FOR SCHOOL, TRIVIA AND HISTORY BUFFS.

#147. CALENDAR-NOTEPAD
THE BEST "CALENDAR MAKER" PROGRAM WE HAVE SEEN. KEEP TRACK OF APPOINTMENTS, SPECIAL OCCASIONS AND PRINT OUT ANY MONTH. INCLUDES A GREAT CALENDAR UTILITY FOR ANY DAY/DATE IN THE FUTURE

#148. KENO & SLOTS
TWO TOP RATED GAMES BY BOB GASTONI. THE VERY BEST AND REALISTIC KENO GAME WE HAVE SEEN. JUST LIKE VEGAS!

#149. GREAT 99/4A GAMES VOL. VII
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EMULATOR—

(Continued from Page 15)

Texas Instruments. In addition, many 4A users also own a PC.

2. At this point the emulator is implemented entirely in software. This means that it is possible to change the machine at virtually no cost. As an example, it is fairly easy to add the extra instructions of the 9995 to the emulator. This would mean a 99/4A running with a 9995 processor. Difficult to do in hardware, but trivial in software.

3. It is possible to add functions and devices that don't exist in the 4A world by implementing the DSRs. Things that spring to mind include SCSI and Ethernet. Thanks to the design of the 4A, foreign devices can be added provided you write the corresponding DSR.

4. The entire TI operating system can be changed, since the contents of the console GROMs and ROMs are in memory. Thus the emulator acts as a GRAMulator. Trivial things like the name of the computer are immediately patchable. More complex things like a new Extended BASIC would depend on somebody with the skills of Rich Gilbertson (of GK XB fame). 80-column BASIC is another possibility.

5. Since the emulator's console GROMs sit in an 8K space, there is 2K left over for extra GROM code, using the same trick as Miller Graphics' Super Extended BASIC.

6. There is true emulation of the 9901 and CRU. This means that direct calls to the keyboard will work, as for example in programs like Telco (if they are ever loaded). Of course, the more usual call to SCAN works by definition.

7. You are not restricted to emulating a 99/4A. If someone could be found that had a 99/8 and there was sufficient information on the machine, we could all be emulating 99/8s instead of a mere 99/4. The same principle applies to the 99/2. Remember the processor emulator does not really know what it is executing, but if it is done correctly it will produce the same result as the original machine.

8. The emulator has a built-in debugger. You can stop the machine on any instruction, patch any location in memory, and save the entire contents of memory to PC disk and then restore it later on.

9. When disk I/O is implemented you will be able to have a large number of "floppy disks" available. In reality, these will be files under the PC's DOS which will contain the equivalent of a 99/4A floppy file system. This means that you do not have to worry about a Myarc (or other) hard/floppy controller, since the emulator will actually use DOS for reading and writing to the hard disk.

10. When the equivalent DSRs are done, you will be able to use the PC's serial and parallel port as if they were on the 99/4A RS-232 card. We already have code that drives the PC serial port directly.

11. Finally, depending on how you look at it, you can justify moving upwards (or sideways) into the PC world. On one machine you can run your favorite TI programs as well as standard PC programs. You thus have the best of both worlds wrapped up in one piece of hardware.

WHY NOT BEFORE?

The question now arises as to why this has not been done before. As with any other software emulator I have ever encountered, the answer is speed. As it stands right now, the emulator only approaches the speed of a 99/4A when running on a PC with an 80486 processor running at 33Mhz, a state-of-the-art machine by today's standards. The emulator will run on an 80286 at 8Mhz (genuine IBM-AT) but it is painfully slow. As a comparison, the emulator on the AT runs slightly faster than a standard 4A running under MG's Explorer. To me, this is not a real problem. By the time our TI's are 10 years old we will be in the 80586 world probably running at 100Mhz. At that stage the emulator will need a delay loop or speed control (much the same as the 99/8 has).

DISADVANTAGES

Now let's look at some of the disadvantages of the emulator:

1. Speed. Until PCs speed up you will always run slower than a 99/4A.

2. Cassette I/O. This is one peripheral that will almost certainly never be implemented. Only the very first IBMs had a cassette port, and those machines are incapable of running the emulator at any practical speed.

3. Sound. The standard PC is not capable of emulating the TI sound chip. The plan is to use a fairly standard card, such as the SoundBlaster for the PC. Calls to the 4A sound chip will have to be translated into calls to the SoundBlaster.

4. Speech. The plan is to use a SoundBlaster and translate speech calls to SoundBlaster speech. Something like this may prove difficult to do, since we have limited knowledge of how 99/4A speech works. Our hope is that someone like Gary Bowser would pick up on this problem.

5. Keyboard. Currently this is the hardest problem to solve. We have assembly code that retrieves the PC scan code, and then allows it to "age". But by the time the 4A emulator raises sufficient CRU lines to detect the key, it can disappear. This makes typing on a slow machine extremely tedious, to say the least.

It seems to me that the development of the emulator is probably the decade's single most important announcement in the 99/4A world (although it was not the first announcement: this came from Germany).

SUPPORT NEEDED

Given the suggested importance, how should we proceed? The current emulator is, in fact, little more than a programming exercise. It proved to me that it could be done, and that it can be extended if the necessary programming talent is available. Unfortunately, my programming resource has itchy feet and is talking of moving on. There are a couple of us less talented programmers who are going to attempt to take up the slack. We feel there is plenty of room for sharing tasks to improve the emulator, but want this to happen in a controlled way. We feel that rather than spend time and money futzing around with Myarc's MDOS, the talents should be harnessed and put to use on the emulator.

If you want the development of the emulator to go ahead, you must participate and you must do so by Sept. 30, 1992. We request that you send $1 and your name and address to: Mike Wright, 45 Centerville Dr., Salem, NH 03079. If we receive more than 1,000 letters, we should be able to persuade our team to continue. If there is insufficient interest, the project will die on the vine. Your $1 is non-refundable and, if the project goes ahead, will be used to build a mailing list and notify you of progress. If insufficient contributions are received, there is no refund. Please understand these conditions before sending money.

MDOS buyout expected to take place this month

The MDOS buy-out spearheaded by Beery Miller was scheduled to take place this month.

Miller posted a message Aug. 1 on Delphi's TIFORUM stating that he was flying to New York Aug. 14 to meet with Lou Phillips of Myarc and Paul Charlton, the author of MDOS, to complete arrangements for the transfer of ownership.

Don Walden, who had previously anticipated his firm, Cecure Electronics, becoming an authorized Myarc repair center by June or July, says that action on this has been delayed because he has "been playing telephone tag" with Phillips. He says he has asked Miller to discuss this with Phillips at their meeting.

Walden says Miller told him that Phillips is adopting a second child, and that paperwork concerning the adoption might preempt the meeting. Otherwise, Walden says, Miller expected it to take place.

Walden says that Cecure Electronics will be able to lower repair prices somewhat if he can obtain access to Myarc's inventory of specialized chips. Also, he notes, developing test procedures takes time, and although Phillips does not have documents on his test procedures, he has said that Walden would be able to take notes on the procedures, which would "speed things along," according to Walden.

Miller was scheduled to obtain the MDOS source code, ABASIC source code and P-System source code on an official basis Aug. 15. The MDOS source is supposed to include changes that will support the P-System and other changes Charlton has made over time. Miller says he will examine the code and make sure it compiles properly to his expectations before leaving New York.

Miller has also accepted some of Phillips' responsibilities, in order to get the code at the price negotiated. The responsibilities include handling the final mailing of MDOS to all registered Geneve owners in Phillips' records, to be forwarded to Miller.

Miller notes in his post, "As I am handling this part of Lou's responsibilities to get the code at a cheaper figure in direct cash outlay, I am still short in the total sum of approximately $500."

Miller says MDOS improvements (and suggestions for improvements will be heard only from contributors to the Buy MDOS Campaign. He notes that he has received donations ranging from $25 to $250. Also, source code will be available only to contributors.

Miller also noted in his message that he has not mailed any issues of 9640 News, his disk magazine for the Geneve 9640, since December, but he hopes to have an issue out before the Chicago fair Oct. 31.

Miller's address is Beery Miller, P.O. Box 752465, Memphis, TN 38175; phone (home) (901) 368-1169. A self-addressed, stamped envelope should be included with MDOS contributions. Address for Cecure Electronics is 7759 So. Scepter Dr. 7, Franklin, WI 53132- 2201; phone (414) 529-2173.

MUNCH video shows tips to protect TI

A videotape, "P.Y.I.," (Protect Your TI Investment) has been produced by MUNCH (Massachusetts Users of the Ninety-Nine Computers and Hobbyists), billed as being for "the non-techie."

The tape contains tutorials on how to take apart a TI (beige as well as black and silver consoles); how to identify the various parts of the inner console; how to clean the console, the ports and other hardware; how to help the power supply "breathe"' by lowering its lockup temperature by drilling lots of holes; and how to change a resistor cheaply to improve monitor image by 40 percent.

Tutorials are by Jack Sughrue, Bruce Willard, Corson Wyman, Louis Holmes, Chris George and Jim Cox.

The video is available for $9.95 plus $3 shipping and handling from MUNCH Video, c/o Jim Cox, 905 Edgebrook Dr., Boylston, MA 01505.

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Printall provides control over document output

By JIM PETERSON

This program will print your text in a choice of 1 to 5 columns, and gives you complete choice of printer controls, fonts, ribbon colors, left and right margins, spacing between columns, lines per page, etc. I think the prompts are self-explanatory. It was written for the NX1020R Rainbow printer, but should be generally compatible with any Epson-type printer.

It takes some time to read in text and format it into multiple columns, so if you need to print more than two copies, or will need more copies in future, it will pay you to print it back to the disk. To do this, at the printer prompt type over the PIO.LF default with DSK and a drive number and file name. The text will then be formatted and printed to a D/V254 file.

The next prompt is for the record length, which will be the default of 80 if the text was prepared with TI-Writer or Funnelweb. However, if you enter 254 you will be prompted for an input filename of a file printed to disk with this program, and for the number of copies wanted, which will then be printed immediately.

If you have Triton's Super Extended Basic module, you can list an XBasic program to disk in 28-column format by LIST "DSKn.filename":28:1-32766. The result will be a D/V28 file. With this program you can print the listings in 5 columns by selecting 28-record length, elite condensed, 5 columns, 28-column width.

However, since the TI-99/4A can only store strings in about 12.5k of console memory, you will get a MEMORY FULL error if you try to format too many lines of condensed print per page. You can gain an extra 1036 bytes by entering CALL FILES(1) and then NEW before loading this program.

USING CTRL U

With this program, you can use "CTRL U" codes, even with multiple-column printing, to underline, emphasize, double-strike, etc., an individual word, phrase or line. If you are printing in multiple columns, you must remember to turn off the codes at the end of the line, or they will affect the same line in all subsequent columns.

Here is how to use the "CTRL U" codes. Load your text into the Funnelweb Editor. Press CTRL 0 to get the hollow cursor. Then check the Tab line. If the R tab is set at the present line length, move it well over to the right so that you can shove lines over without losing characters - for this reason, CTRL U codes cannot be used with 80-column text.

Now, if you are going to insert codes into any line which ends in blanks, you must first put a dummy code right after the end of the line to hold its length. For instance, if your text is in 40 columns, put a dummy code in column 41. I use ASCII 17, which puts the printer on-line — since the printer is already on line, it is ignored. To enter ASCII 17, use CTRL U Shift Q.

If your text has been right-justified, it is easy to find the right column for the dummy code; otherwise, it can be difficult. Also, you must be very careful that you don't have a carriage return, ASCII 13, in front of your control codes.

USING DUMMY

To simplify all that, just run your text through this little program, which will strip the carriage returns and add a dummy code at the end of each line.

```
100 DISPLAY AT(12,1)ERASE AL
L:"Input file? DSK":"Output
file? DSK":"line length?  "
110 ACCEPT AT(12,16):IF$ ::
ACCEPT AT(13,17):OF$ :: ACCE
PT AT(14,14):L
120 OPEN #1:"DSK"&IF$,INPUT
:: OPEN #2:"DSK"&OF$,OUTPUT
130 LINPUT #1:M$ :: P=POS(M$
,CHR$(13),1):: IF P<>0 THEN
M$=SEG$(M$,1,P-1)
140 PRINT #2:M$&RPT$(" ",L-L
EN(M$))&CHR$(17)
150 IF EOF(1)<>1 THEN 130 EL
SE CLOSE #1 :: CLOSE #2
```

Now, if you want to emphasize a word, position the cursor on its first character (be sure you are in open-cursor mode!), press FCTN 2 to insert and tap the space bar twice to shove the line two spaces right. Use FCTN S to backspace two spaces. Use CTRL U FCTN R CTRL U to put the escape code ASCII 27 in the first of those spaces, put Shift E in the second space. Go to the first character after the end of the word, use the same method to shove another two spaces, fill those spaces with ASCII 27 and Shift F to turn off emphasized. If you are emphasizing an entire line, put the turn-on codes at the beginning of the line. You can put the turn-off codes after the dummy code at the end, except when you are underlining; in that case, put them directly after the last character so you do not underline the blank spaces.

That's all there is to it. Pressing CTRL U gives you an underline cursor. While the cursor is that shape, 64 is subtracted from the ASCII of any key you press. Thus, ASCII 65, the Shift A, becomes ASCII 1. In underline mode, FCTN R gives you ASCII 27, the escape code which begins each printer control sequence. Pressing CTRL U again returns you to the normal mode, so you can enter the second character of the code. If the code requires a third character, CTRL U gets you back into underline, in which Shift 2 is ASCII 0 and Shift A through Shift Z are ASCII 1 through ASCII 26.

With this method, you can print individual lines or words in italics, double-struck, emphasized, underlined, superscript, in different NLQ fonts or different colors, or any combination of those. However, do not use CTRL U codes for any feature which you plan to select from Printall, because turning it off will turn it off for the rest of the text.

Although this program is intended primarily for multiple-column printing, it has other uses. If your letter turns out to be 70 lines long and you would like to print it on one page, use this program and select 70 lines. If you need a double-spaced manuscript, select 30 lines. If you need a tiny list, such as a list of the songs to put in a music cassette, select elite condensed superscript and 120 lines per page.

(Program starts on next page)

PRINTALL—

```
100 DIM M$(600),F$(50)!130
110 GOTO 160 !239
120 K,ST,SET,S,P$,P,CL,DW$,S
S$,I$,D$,E$,NC,CW,TC,TA,TX,A
V,CS,S$,LT,A$,LSP,LP,RM,OK$,
QQ$,X,F$(),SL,F,IP,M$(),T$,F
LAG,J,PP,LT$,Q$,F,RL,N,X$ !2
41
130 EV$,COMP,MAXL !134
140 CALL CLEAR :: CALL KEY :
: CALL COLOR :: CALL SCREEN
:: CALL SOUND !049
150 !@P- !064
160 CALL CLEAR :: CALL KEY(3
,K,ST):: ON WARNING NEXT !19
0
170 FOR SET=0 TO 14 :: CALL
COLOR(SET,2,8):: NEXT SET ::
 CALL SCREEN(5):: X$=CHR$(27
)!131
180 DISPLAY AT(3,6):"TIGERCU
B PRINTALL" :: DISPLAY AT(5,
11):"V.1.6.1":"":" for the N
X1020R and other  Epson-com
patible printers" !029
190 DISPLAY AT(10,1):"Progra
mmed by Jim Peterson" !038
200 DISPLAY AT(18,7):"TURN P
RINTER ON!":;:"Set top of fo
rm half inch  below perfora
tions" !137
210 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 210 EL
SE CALL CLEAR !222
220 DISPLAY AT(12,1):"Printe
r designation?" :: DISPLAY A
T(14,1):"PIO.LF" :: ACCEPT A
T(14,1)SIZE(-28)BEEP:P$ :: I
F POS(P$,"DSK",1)<>0 THEN 24
0 !057
230 IF POS(P$,".LF",1)=0 THE
N P$=P$&".LF" !119
240 OPEN #1:P$,VARIABLE 254
:: PRINT #1:X$&"@";:: CALL C
LEAR !216
250 DISPLAY AT(12,1)ERASE AL
L:"Input record length? 80"
:: ACCEPT AT(12,22)VALIDATE(
DIGIT)SIZE(-3)BEEP:RL :: IF
RL<>254 THEN 320 !222
260 DISPLAY AT(12,1)ERASE AL
L:"Filename? DSK" :: ACCEPT
AT(12,14)BEEP:F$ !062
270 OPEN #2:"DSK"&F$,VARIABL
E 254,INPUT !107
280 DISPLAY AT(14,1):"How ma
ny copies? 1" :: ACCEPT AT(1
4,18)BEEP:N !040
290 FOR J=1 TO N !141
300 LINPUT #2:M$ :: PRINT #1
:M$ :: IF EOF(2)<>1 THEN 300
 !090
310 RESTORE #2 :: NEXT J ::
CLOSE #2 :: GOTO 220 !181
320 DISPLAY AT(12,1):"Print
size?": :"  (1) Pica":"  (2)
 Elite":"  (3) Condensed":"
 (4) Elite condensed" !188
330 ACCEPT AT(12,13)VALIDATE
("1234")SIZE(1)BEEP:P :: IF
P=2 THEN PRINT #1:X$&"M";ELS
E IF P=3 THEN PRINT #1:CHR$(
15);ELSE IF P=4 THEN PRINT #
1:X$&"M"&CHR$(15);!182
340 CL=(P=1)*80+(P=2)*96+(P=
3)*136+(P=4)*160 :: CL=ABS(C
L)!062
350 DISPLAY AT(12,1)ERASE AL
L:"NLQ characters? Y" :: ACC
EPT AT(12,17)VALIDATE("YN")S
IZE(-1)BEEP:Q$ :: IF Q$="N"
THEN 380 !005
360 DISPLAY AT(12,1):"Font?
1":"":"(1) Courier":"(2) San
serif":"(3) Script":"(4) Ora
tor" !168
370 ACCEPT AT(12,7)VALIDATE(
"1234")SIZE(-1)BEEP:F :: F=(
F=1)*0+ABS(F=2)+(F=3)*-4+(F=
4)*-7 :: PRINT #1:X$&"x"&CHR
$(1)&X$&"k"&CHR$(F);!046
380 DISPLAY AT(12,1)ERASE AL
L:"Use color? N" :: ACCEPT A
T(12,12)VALIDATE("YN")SIZE(-
1)BEEP:Q$ :: IF Q$="N" THEN
410 !079
390 DISPLAY AT(12,1):"Color?
 1":"(1) Black":"(2) Red":"(
3) Blue":"(4) Violet":"(5) Y
ellow":"(6) Orange":"(7) Gre
en" !206
400 ACCEPT AT(12,8)VALIDATE(
"1234567")SIZE(-1)BEEP:J ::
PRINT #1:X$&"r"&CHR$(J-1);!1
17
410 DISPLAY AT(12,1)ERASE AL
L:"Double-width? N" :: ACCEP
T AT(12,15)SIZE(-1)VALIDATE(
"YN")BEEP:DW$ :: IF DW$="Y"
THEN PRINT #1:X$&"W"&CHR$(1)
;:: CL=CL/2 !045
420 DISPLAY AT(12,1)ERASE AL
L:"Superscript? N" :: ACCEPT
 AT(12,14)SIZE(-1)VALIDATE("
YN")BEEP:SS$ :: IF SS$="Y" T
HEN PRINT #1:X$&"S"&CHR$(0);
!027
430 DISPLAY AT(12,1)ERASE AL
L:"Italics? N" :: ACCEPT AT(
12,10)VALIDATE("YN")SIZE(-1)
BEEP:I$ :: IF I$="Y" THEN PR
INT #1:X$&"4";!107
440 DISPLAY AT(12,1)ERASE AL
L:"Double-strike? Y" :: ACCE
PT AT(12,16)VALIDATE("YN")SI
ZE(-1)BEEP:D$ :: IF D$="Y" T
HEN PRINT #1:X$&"G";!220
450 IF P<3 AND SS$<>"Y" THEN
 DISPLAY AT(12,1):"Emphasize
d? Y" :: ACCEPT AT(12,13)VAL
IDATE("YN")SIZE(-1)BEEP:E$ :
: IF E$="Y" THEN PRINT #1:X$
&"E";!079
460 DISPLAY AT(12,1)ERASE AL
L:"Number of columns? (1-5)"
 :: ACCEPT AT(12,26)VALIDATE
("12345")SIZE(1)BEEP:NC !091
470 DISPLAY AT(12,1):"Column
 width (number of": :"charac
ters?" :: ACCEPT AT(14,13)VA
LIDATE(DIGIT)BEEP:CW !159
480 TC=NC*CW :: TA=CL-TC ::
TX=TC+NC*2-2 !080
490 IF TX<=CL THEN 510 :: DI
SPLAY AT(18,1):STR$(NC)&" co
lumns of "&STR$(CW)&" charac
ters":"plus 2-column spacing
 equals" !225
500 DISPLAY AT(20,1):STR$(TC
)&" characters; maximum":"av
ailable in print size":"sele
cted is "&STR$(CL)&".":"****
Please reselect****" :: GOTO
 320 !219
510 IF NC=1 THEN 530 :: AV=I
NT(TA/(NC-1)):: DISPLAY AT(1
2,1)ERASE ALL:"Column separa
tion?":"minimum 2":"maximum
"&STR$(AV)&" available ":"2"
 !109
520 ACCEPT AT(15,1)VALIDATE(
DIGIT)SIZE(-2)BEEP:CS :: IF
CS<2 OR CS>AV THEN 520 ELSE
```

(See Page 22)

PRINTALL—

(Continued from Page 21)

```
S$=RPT$(" ",CS)!053
530 TA=TA-CS*(NC-1):: IF TA<
2 THEN 570 !199
540 DISPLAY AT(12,1)ERASE AL
L:"Left margin width?": :"ma
ximum "&STR$(TA)&" available
" :: ACCEPT AT(12,20)VALIDAT
E(DIGIT)BEEP:LT :: IF LT>TA
THEN 540 !216
550 DISPLAY AT(12,1):"Altern
ating left/right":"margins (
for pages to be":"later repr
oduced on both":"sides) N" !
032
560 ACCEPT AT(15,8)VALIDATE(
"YN")SIZE(-1)BEEP:A$ !220
570 LSP=12 :: DISPLAY AT(10,
1):" ":" ":"Lines per page?
60":" ":" ":" ":" " :: ACCEP
T AT(12,17)VALIDATE(DIGIT)SI
ZE(-3)BEEP:LP !145
580 LSP=72/(LP/10):: PRINT #
1:X$&"A"&CHR$(LSP);!065
590 RM=TA-LT !084
600 DISPLAY AT(12,1)ERASE AL
L:STR$(NC)&" columns of":STR
$(CW)&"-character width":"le
ft margin of "&STR$(LT)&" sp
aces" !208
610 DISPLAY AT(15,1):STR$(LP
)&" lines per page":"with "&
STR$(INT(LSP))&"/72 line spa
cing" !222
620 DISPLAY AT(17,1):STR$(CS
)&" spaces between columns":
"right margin of "&STR$(RM)&
" spaces": :"OK? Y" !122
630 ACCEPT AT(20,5)VALIDATE(
"YN")SIZE(-1)BEEP:OK$ :: IF
OK$="N" THEN 320 !128
640 DISPLAY AT(12,1)ERASE AL
L:"Pause at end of page? N"
:: ACCEPT AT(12,23)VALIDATE(
"YN")SIZE(-1)BEEP:QQ$ :: IF
NC=1 THEN 660 !056
650 DISPLAY AT(12,1)ERASE AL
L:"Print last page in even":
"columns? Y" :: ACCEPT AT(13
,10)VALIDATE("YN")SIZE(-1)BE
EP:EV$ !201
660 DISPLAY AT(1,1)ERASE ALL
:"Input filenames to be":"pr
inted.":"Press Enter when do
ne." !011
670 X=X+1 :: DISPLAY AT(X+3,
1):"Filename  DSK" :: ACCEPT
 AT(X+3,14)SIZE(-12)BEEP:F$(
X)!203
680 IF F$(X)="" THEN X=X-1 :
: GOTO 710 ELSE F$(X)="DSK"&
F$(X)!172
690 ON ERROR 700 :: OPEN #2:
F$(X),INPUT ,VARIABLE RL ::
CLOSE #2 :: GOTO 670 !216
700 ON ERROR STOP :: CALL SO
UND(1000,110,0,-4,0):: DISPL
AY AT(20,1):"CANNOT OPEN "&F
$(X):: X=X-1 :: RETURN 670 !
062
710 ON ERROR STOP !216
720 SL=1 :: IF NC>1 THEN F=0
 :: GOTO 800 !073
730 K=0 :: PP=1 :: LT$=RPT$(
" ",LT):: FOR J=1 TO X :: OP
EN #2:F$(J),INPUT !182
740 LINPUT #2:Q$ :: IF POS(Q
$,RPT$(CHR$(213),5),1)<>0 TH
EN 780 :: K=K+1 :: PRINT #1:
LT$&Q$&CHR$(10):: IF K<LP TH
EN 780 !054
750 IF QQ$="N" THEN 770 !156
760 DISPLAY AT(24,7):"PRESS
ANY KEY" :: DISPLAY AT(24,7)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 760 EL
SE DISPLAY AT(24,7):"" !147
770 PRINT #1:CHR$(12):: K=0
:: PP=PP+1 :: IF PP/2=INT(PP
/2)AND A$="Y" THEN LT$=RPT$(
" ",RM)ELSE LT$=RPT$(" ",LT)
!122
780 IF EOF(2)<>1 THEN 740 !1
42
790 CLOSE #2 :: NEXT J :: PR
INT #1:CHR$(12):: STOP !078
800 F=F+1 :: IF F>X THEN 890
 :: ON ERROR 810 :: OPEN #2:
F$(F),INPUT ,VARIABLE RL ::
DISPLAY AT(22,1):"Reading ";
F$(F):: ON ERROR STOP :: GOT
O 820 !120
810 CALL SOUND(1000,110,0,-4
,0):: DISPLAY AT(20,1):"COUL
D NOT OPEN "&F$(F):: STOP !1
49
820 FOR IP=SL TO LP*NC :: LI
NPUT #2:M$(IP):: DISPLAY AT(
24,12):IP :: IF LEN(M$(IP))=
0 THEN 860 :: IF NC>1 AND PO
S(M$(IP),CHR$(13),1)<>0 THEN
 M$(IP)=SEG$(M$(IP),1,LEN(M$
(IP))-1)!040
830 IF LEN(M$(IP))=0 THEN M$
(IP)=RPT$(" ",CW)!092
840 IF POS(M$(IP),RPT$(CHR$(
213),5),1)<>0 THEN IP=IP-1 :
: GOTO 870 !082
850 IF ASC(M$(IP))<32 OR POS
(M$(IP),CHR$(27),1)<>0 OR AS
C(SEG$(M$(IP),LEN(M$(IP)),1)
)=32 THEN 860 !148
860 IF LEN(M$(IP))<CW THEN M
$(IP)=M$(IP)&RPT$(" ",CW-LEN
(M$(IP)))!168
870 IF EOF(2)=1 THEN CLOSE #
2 :: SL=IP+1 :: GOTO 800 !22
1
880 NEXT IP :: IF EOF(2)=1 T
HEN CLOSE #2 :: GOTO 900 ELS
E GOTO 900 !022
890 FLAG=1 :: FOR J=IP+1 TO
NC*LP :: M$(J)="" :: NEXT J
:: GOTO 900 !198
900 PP=PP+1 :: IF PP/2=INT(P
P/2)AND A$="Y" THEN LT$=RPT$
(" ",RM)ELSE LT$=RPT$(" ",LT
)!188
910 IF EV$="Y" AND F>X AND I
P<LP*NC THEN LP=INT(IP/NC)+1
 !045
920 FOR J=1 TO LP :: ON NC G
OSUB 940,950,960,970,980 ::
NEXT J :: PRINT #1:CHR$(12):
: SL=1 :: IF F>X THEN STOP E
LSE IF QQ$="N" THEN 820 !008
930 DISPLAY AT(24,1)BEEP:"Pr
ess any key to continue" ::
CALL KEY(0,K,S):: IF S=0 THE
N 930 ELSE DISPLAY AT(24,1):
"" :: GOTO 820 !017
940 PRINT #1:LT$&M$(J)&CHR$(
10):: RETURN !028
950 PRINT #1:LT$&M$(J)&S$&M$
(J+LP)&CHR$(10):: RETURN !13
6
960 PRINT #1:LT$&M$(J)&S$&M$
(J+LP)&S$&M$(J+LP*2)&CHR$(10
):: RETURN !178
970 PRINT #1:LT$&M$(J)&S$&M$
(J+LP)&S$&M$(J+LP*2)&S$&M$(J
+LP*3)&CHR$(10):: RETURN !22
1
```

(See Page 23)

MICRO-REVIEWS

Fonts and Borders Vol. IV, Pollster, Astro-Mania, Encyclopedia of Graphics Vol. 3

By STAN KRAJEWSKI

Happy anniversary to me! It has been one year already, as this is my 12th column. I have enjoyed expressing my views while writing these columns. I feel good being part of the TI users' structure as I help programmers perfect their programs. It has not been the chore I had expected, plus, it has kept me in touch with the TI world from a city that has no toll-free access to any on-line service. (This is a hint for on-line companies.)

I received my first program from Program Innovators this month. I would like to add their name to the catalogs available for software for the TI. Program Innovators' small, but full-of-bargains, catalog is worth mentioning. They offer many games and include game packages for $10 and under. They also offer Wall Street and a football prediction program.

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.

★★★

FONTS & BORDERS VOL. IV

This SS/SD disk contains four fonts and four full Artist screens of borders. System requirements are Geneve 9640 or TI99/4A, memory expansion, disk system, Extended BASIC and TI-Artist V 2.01 or TI-Artist Plus.

Everything on this disk is pictured with the file names next to each font & border. The first font is Legend. This is a fancy script type print, letters are not connected to each other. Unlike some other script-like characters I have seen, these are easy to read. This is a large file and does require TI-Artist Plus to use upper case, lower case, numbers and shift characters. Loading from an older version limits the buffer to capitals only and even then you only get letters A to W.

The picture files on this disk may be used with earlier versions of TI-Artist. Beton and Codex fonts loaded for me with TI-Artist 2.1. However, a few Codex shift characters did not load. TI-Artist Plus should be used for all fonts so as not to experience any problem. These files are not limited to just TI-Artist, but can be used with other programs such as The Printer's Apprentice and Page Pro. Alterations may be made, as explained in the docs, to make all the fonts compatible with earlier versions also.

Beton Open Condensed Caps are capital hollow characters with a shadow. These are smaller in size than 3D and include many shift characters and numbers. Codex is a freehand-style print font which includes both upper and lower case, numbers and shift characters. Coffee Can is a font with well done large two-tone characters. The top half is filled and the bottom half of each character is not. These characters are loaded individually, and include four shift characters.

The four borders do not come as completed borders. The screen is filled with as many as 11 sections and may be manipulated to suit your needs. These range from floral to a clipboard in design. Thus, you can create several borders out of each of the four.

I had trouble loading the fonts from the Geneve with the older version of TI-Artist, even if I used the Geneve with the TI-Artist patch. The borders worked on both the TI and the Geneve.

Fonts and Borders Vol. IV is priced at $7 + $1 S&H, and is available from Notung Software, 7647 McGroarty St., Tujunga, CA 91042.

★★

POLLSTER

This is a program for those who have an interest in politics or who want to anticipate an election. The reason I gave two stars is partly because of the problems mentioned below but mostly because I question whether this kind of program really attracts the interest of TIers. I think more time should be spent on programs that upgrade our system more closely to the capabilities of other computers. Although an interest in politics is not my specialty, I will attempt an accurate review of this program.

System requirements are Geneve 9640 or TI99/4A, memory expansion, disk drive, and Extended BASIC. A printer is optional. Pollster attempts to project the winner of a presidential election based upon the traditional voting patterns of the individual states combined with early results reported.

Upon booting this program you will have a choice between three options from the main menu: Read Docs; Pollster — Presidential projection program; and PollUpdate — Create and update Pollster files.

If you select Pollster you are greeted with the national anthem and a graphical look at two party symbols and a ballot going in the box. As you continue, you can enter candidates' names from Democratic, Republican and Independent parties. The next menu shows Update State Vote Totals, Latest Projections, Nation Wide Report, States Abbreviations & Electoral Votes and Program Documentation. You are prompted for a printer option before each selection.

PollUpdate's menu includes Load A File, Create A Results File, Alter A File, Save A File, Display A File, Print Out A File, Merge Results With Average, Balance an Average File, Transfer Data to POLL File and Read Disk Catalog.

(See Page 24)

PRINTALL—

(Continued from Page 22)

```
980 PRINT #1:LT$&M$(J)&S$&M$
(J+LP)&S$&M$(J+LP*2)&S$&M$(J
+LP*3)&S$&M$(J+LP*4)&CHR$(10
):: RETURN !009
```

MICRO-REVIEWS

(Continued from Page 23)

The Average file calculates the percentages of votes. It then awards the winning party the total electoral votes of that state. The Results file holds previous vote percentages and is then used to merge with the Average file to create a new Average. The States file contains all 50-states and Washington, D.C. It resides in memory for use with the other files.

The program ran sufficiently and performed as it was made to do. However, there was no error trapping with misspelled file names and the program would break. I also could not find a way out of the program when I wanted to, without pressing FCTN 4 to quit the program. Options were provided for a printout with most all of the program. Although you were able to read the docs in several areas of the program, I feel a print option for that would have been advantageous.

This program is available from Program Innovators, 4122 Glenway, Wauwatosa, WI 53222, priced at $9.

★ ★ ★

ASTRO-MANIA

I am happy to review a game this time. From the programs I have been getting, it seems games haven't been the most produced software lately. The author of this program is working on creating more games for the TI. That makes this reviewer happy. This is a one-player game, although I would like to see more two-player games.

System requirements are Geneve 9640 or TI99/4A, memory expansion, disk drives, Extended BASIC and joystick. This SS/SD disk comes with 18 files for the execution of this game, and its separate, graphical spiritual message.

The scenario is your planets have been trapped by Frizoid invaders. Only your squadron of ships is outside the forcefields surrounding your planets. You must defeat the guard ships and save the planets from the Frizoids.

The title screen appears, then a rocket appears showing you on your way through space. As you start on level one, you are in battle going horizontally through space. Cities are passing below with a forcefield hovering above it. Straying too low can be deadly as you try to avoid being hit by lasers fired by a ship just opposite you. At the same time, you are returning fire to get as many hits as you can, so you can proceed to the next level. Every other level will put you in a vertical battle to destroy enemy generators. The game will come to an end after the fifth level, in which you destroy the mother ship.

The many different screens keep your interest in the game. Game play has a good difficulty level. Finding a secret button on the keyboard will bring you to a special Menu Screen letting you enhance your play. As this is a TI Extended BASIC game, joystick response is a little slow. Playing it with speed 3 or greater on the Geneve will greatly enhance joystick response.

The multiple files give many extra effects not normally found in other games. After you lose all your ships, the screen will display a big BOOM surrounded by flashing multiple colors. Also, at other times throughout the game you will also see graphical surprises. An auto-continuing function allows you to continue the game at any time from where you left off, or you can just start over by pressing Start instead of Continue. The planets' cities below have above average graphics, and are a close representation to the graphics in Parsec.

Timothy Bodenmiller will sell his program to TI software suppliers or TI users. The retail price of this game is $9.95 + $1 S&H. Software distributors and user groups may contact him for special discounts. For your copy of Astro Mania you may write to: Bodenmiller Computers, 43 Monroe St., Berea, OH 44017.

Software And More lists sale prices

Software And More is offering sale prices on several of its programs. Grafiks and Music V2.2, is selling for $19.95, regularly listed at $24.95. Musical Christmas Tree, List of Labels and Valentine Card are all on sale for $10, regularly $19.95.

For a catalog, send $1 to Software And More, 5820 S.E. Westfork St., Portland, OR 97206-0742.

★ ★ ★ ★

CTIUG'S E.O.G. VOL. 3

This is the most comprehensive list of graphics and fonts for the TI and Geneve that I have seen. E.O.G. stands for Encyclopedia of Graphics. It is available exclusively from the publisher, the Chicago TI99/4A Users' Group.

In the past, volume 1 was released containing commercially available fonts (MICROreviews December 1990). Volume 2 is a compendium of all if the TIPS (TI Print Shop) graphics. All pages of all the volumes have three holes punched for insertion into a loose-leaf binder. A cover page is also included. Now about Volume 3. This compilation of more than 70 pages has graphics and filenames on both sides of the page. It starts out with commercially available /GR graphics available from Texaments and Comprodine. On the top of the page information is given such as the disk name and number and type of files it contains.

Three quarters of the graphics in Volume 3 are additional TIPS which became available after the release of Volume 2. Towards the rear of the pages are updates of fonts that were available after E.O.G.'s Volume 1 was published. An index is also included.

I did not receive volume 2, and I can't comment on how well done the index is on identifying these graphics. The documentation I received with this package, it does mention a index in volume 2. In Volume 3, all that is included on the pages of the TIPS graphics are the disk filenames and file names of the graphics. If you like what you see, you can't tell where it is available from, or what disk you would ask for. There is an index included with the CSGD graphics including Program, Disk, Disk Name, Company And #/GR Files.

The CTIUG plans to continue to release supplements of these volumes as more graphics and fonts are released. The cost of each volume is $10 + $3 S&H. All three volumes can be obtained for $33 postage paid. Overseas rates, add an additional $6. Write Chicago Users Group, 2515 Marcy, Evanston, IL 60201-1111.

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.

GEN/DIR

GENeric DIRectory reveals all about files

By JOHN KOLOEN

GENeric DIRectory, by Norm Sellers, is a disk directory program that supports functions not available with other similar programs. In addition, with a companion program it is useful in recovering lost sectors and handling bad sectors on floppy disks.

The program loads out of Editor/Assembler or TI-Writer and requires a memory expansion and disk system. On the Geneve it is loaded through GPL.

Performance: GEN/DIR's main menu consists of seven options. They are:

1. Update File Dates — dates all files worked on today or all files missing date/time stamps. The program displays the time and date of the most recent update. Executing this function for the first time on a disk with several dozen files takes several minutes. This option can be ignored if you don't want date/time stamps.

2. Directory Optl Dates — This displays a complete directory of a disk with date/time stamp automatically placed on files that are not stamped. It's also through this option that you are able to enter extended file descriptions.

3. Recover Lost Sectors — This function clears the bitmap of the disk. It then goes through the alphabetical directory of the files and sets all bits to one in the cleaned bitmap that correspond to sectors zero or one or are actually used in any file on the disk. This function can also be used to recover deleted files if none of their unprotected sectors have been overwritten. To do this, you must find the sector with the deleted filename in the first 10 positions in sectors 2 to 21. Then add the sector number to the list of sector numbers found in sector one.

4. Mark Bad Sectors — Reads the disk looking for bad sectors. If a bad sector is found, GEN/DIR attempts to make a file header named BADSECTORS whose sectors include the bad sectors.

Review

Report Card

Performance ..... **A**
Ease of Use ..... **B**
Documentation ..... **B**
Value ..... **B-**
Final Grade ..... **B**

Price: $20 for GEN/DIR, $15 for Data Receover Option, $30 for both
Manufacturer: Norm Sellers, 15 Dorset Place, Broomall, PA 19008
Requirements: TI99/4A with Editor/Assembler or TI-Writer, memory expansion, disk system; or Geneve; printer optional

5. Delete File With Bad Sectors — This option is used after running option four. The file is deleted and the sectors in the BADSECTORS file are again marked "for use."

6. Setup — This option lets you select defaults for everything from printer control codes to cursor speed and screen colors.

7. Exit — Returns you to the cartridge menu screen.

The unique feature of GEN/DIR — let's use the word "unusual" since I'm not sure that I'm informed enough to label this as *unique* — is the disk directory it displays. First of all, it creates the directory in three forms: screen display, printer output and as a disk file, provided there's sufficient space on the disk. The directory that appears on-screen has so much information that you must toggle the screen from left to right, up and down to see it all. The best way to view it is on a printout, or on an 80-column screen, such as with a Geneve. (See Fig. 1 for sample of the printout.)

Menu option 2 is the one that actually produces the directories. And it's from this option that you are able to enter extended file descriptions. After the directory appears, press CTRL P and the cursor automatically moves to the extended file description field of the first filename. You can then type in whatever text you want and do the same with other files.

The directory includes nine fields. They are:

Filename — The same as in other disk utilities.

Size — sectors used by the file.

Type — D (display), I (internal), PROG (program file), V (variable length records), F (fixed length records), n (record length), trailing C (compressed object file), trailing F (formatter type data file).

Protection status — P means protected.

Fig. 1

```
GEN/DIR      Used=350 Lost=  0 Avail= 10  Date=92/08/10
File Name  Siz Type P Entry  YY/MM/DD HH Description                    Programmers Info
---------- --- ---- - ------ -------- -- ****************************** ----------------------------
-README     13 DV80 P        92/01/09 00 READ THIS FILE FIRST           BYTES CODE  8276 LINES 22594
DTDI1       28 PROG P (ASM)  90/12/26 23 ROOT TO GEN/DIR                LOAD @>24F4 LENG >1ACE
DTDI2       33 PROG P (ASM1) 90/12/26 23 DISK DIRECTORY PART 1          LOAD @>A000 LENG >1FFA
DTDI3       24 PROG P (ASM1) 90/12/26 23 DISK DIRECTORY PART 2          LOAD @>BFFA LENG >1658
DTDI4        2 PROG P (ASM1) 90/12/26 23 DISK DIRECTORY PART 3          LOAD @>D652 LENG >0010
DTDI5        2 PROG P (ASM)  90/12/26 23 DISK DIRECTORY PART 4          LOAD @>F112 LENG >00B8
DTDIA       12 PROG P (ASM1) 92/01/14 14 DISK CLEANUP   PART 1          LOAD @>A000 LENG >0A24
DTDIB        4 PROG P (ASM)  92/01/14 14 DISK CLEANUP   PART 2          LOAD @>AD24 LENG >0218
```

Entry — See description below.

YY/MM/DD — Date stamp.

HH — Time stamp.

Extended description — Entered by user, the data is saved to a file called DT-DIRECTRY.

Programmers info — Automatically provides information about programs on the disk.

Another unusual feature is the "Entry"

(See Page 26)

GENERIC DIRECTORY—

(Continued from Page 25)

name field for object files. The field provides information about many of the file types on the disk. Values are :

(ASM) — single or last of a series of assembly program files.

(ASMn) — a non-last-of-a-series assembly program file.

(BAS) — TI BASIC program file.

(X B) — Extended BASIC file.

(A B) — Assembly embedded in TI BASIC file.

(AXB) — Assembly embedded in Extended BASIC file.

(DAT) — Data file (used for PROG type).

GEN/DIR also provides information about the disk at the top of the directory. Included are disk name, number of used sectors, number of lost sectors, sectors available and date.

Documentation: The docs consist of an eight-page D/V80 file that can be displayed on screen or output to a printer. It covers what the program does and how to use the various CTRL and FCTN keys, most of which are reminiscent of TI-Writer FCTN and CTRL operations.

Ease of Use: GEN/DIR poses no problems in operation. It is menu and prompt driven and leaves little to the imagination. The only "problem" I encountered was with severely fragmented files. GEN/DIR handles files with up to nine fragments but runs into problems with more than that. An error message appears on the screen when this occurs — "FILE/S TOO.FRAGMENTED, MUST FILE COPY TO NEW DISK." The operation stops and you are presented with a screen with prompts for operating on another disk or returning to the main menu. Since the program uses CTRL keys to access certain functions, you have to keep the docs in front of you until you've learned the program.

GEN/DIR consists of more than a dozen files, and loads routines from the program disk whenever certain functions are executed. So it works best with a multi-drive system. Those with a single disk drive will find themselves switching disks fairly often.

GEN/DIR seems to be bomb-proof. However, unlike most utilities, it is protected. The protection is based on the user's name and address. If you change it, the program is partially disabled. According to the author, only registered copies which are produced by him are likely to be fully functional.

Value: GEN/DIR is priced at $20 for the directory program and $15 for the disk cleanup program. My copy of GEN/DIR includes both. I think paying $35 for the two programs is too much. Both of them can be had for $30 as a package. However, this also seems too much, given the variety of shareware disk utility programs on the market. However, this is not shareware.

GEN/DIR provides more information about the contents of a disk than most similar programs. It runs on both the TI and the Geneve and is relatively specialized. If you need or want extensive information about files then GEN/DIR is worth consideration. Remember, though, it is not a disk manager. Its main utility is in providing information about files. With its companion sector marking and recovery segments it also provides a level of data recovery options missing from many disk managers.

Smart Connect

A gem of a program

By PETER K. SUHMANN

Every so often, a real gem of a program comes along. Bruce Harrison of Harrison Software has created such a masterpiece. The program is called Smart Connect and it allows the transfer of files between a 100 percent TI99/4A and an IBM PC or clone. If you, like me, have to work in the IBM environment, but all your text files at home have been created on a TI99/4A, this program is for you.

As a science teacher, I have created a lot of Display/Variable 80 text files for tests, worksheets and lessons. I must update these files as new information becomes available. Since I am only a two-finger typist, retyping takes time and spelling errors are a big problem. Smart Connect allows me to transfer my D/V80 text files to an IBM-compatible PC and save them to a disk. Then I can call up the file on my word processor, make my changes on a full screen, spell check it and save the file to a PC disk and then to a TI disk. I like the redundancy, as my children tie up the IBM clone with their school work and I use my friendly TI99/4A for my work. Smart Connect allows me to copy my TI files and use them with the school's IBM PS-2 computer.

Performance: Smart Connect transfers D/V80 or ASCII files between the TI99/4A and an IBM PC via the RS232 ports. On the PC end, two programs are supplied that run in GW-BASIC or Q-BASIC. On the TI end, the program runs out of the Extended BASIC, Editor/Assembler or TI-Writer modules. D/V80 files are those created by E/A, TI-Writer, Funnelweb or other programs such as Bill Gaskill's MICROdex 99 data base and its Display/Fixed 80 to D/V80 conversion program.

(See Page 27)

Review

Report Card

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

Cost: $10 (includes S&H)

Manufacturer: Harrison Software, 5705 40th Place, Hyattsville, MD 20781

Requirements: TI99/4A, 32K memory, disk system, Extended BASIC, TI-Writer or Editor/Assembler module, IBM PC or clone, RS232 cable (9 to 25 pin or 25 pin to 25 pin) and word processor for the PC.

SMART CONNECT—

(Continued from Page 26)

Most of today's PC word processors such as Wordstar 5.5, First Choice and Word For Windows have routines for converting text files to ASCII and vice versa. In our world, ASCII files are called DV/80 files. So before you read or save these files with your word processor, you may have to convert them, just a simple matter of indicating to the word processor what you will be importing.

All transfers begin on the PC end by loading the read or send program, and are controlled from the TI end by the keyboard after the TI program is loaded. The program runs at 1200 baud and the screens of both computers display the text lines as they are transferred and saved to disk or read from a disk. If an error occurs, you can see the point at which the transfer stopped. Then you end the transfer, correct the error and resume your transfer.

The TI files don't cause problems, since most commands are dot or transliterate commands that just transfer as text. The PC files are the problem in the transfer, and are easy to correct. Wordstar 5.5 uses "^" commands, such as ^S, that can give an "error in the PC file" message on the TI screen. Not all ^ commands in a file cause this error message. I have found these to cause an error: ^S (underline), ^Y (delete) and ^T. Oddly, ^B (bold) causes no problem for me. You'll have to stop the transfer corrector, delete the command that causes the error in the PC file and start up again. Wordstar 5.5 works well with the TI-Writer and Funnelweb.

Word for Windows V.3 files are read without a problem. I haven't tested all characters and control codes. Since Windows uses graphic character controls and codes, these translate into commands that put a lot of "garbage" on the control line. You can erase this garbage with a space bar or whatever you fancy. Once deleted of garbage, the file is usable. Even with the garbage, the files can be saved to a TI diskette and cleaned up later.

Smart Connect will take PC files that are too large, break them down into smaller files that the TI memory will hold and store them to disk. To do this file fracturing, you specify the name for the file to be saved. If you name the file MODELA, the subsequent files will automatically increment as MODELB, MODELC, etc. If the end character is a number, fracturing will continue the sequence MODEL1, MODEL2, etc., until the entire file is saved.

One neat application I found for Smart Connect was manipulating data and files in Bill Gaskill's MICROdex 99 program. MICROdex 99 is a program that allows you to catalog and retrieve magazine information. I have used it to catalog 80 years of model railroad magazine articles. MICROdex 99 creates a Display/Fixed 80 file and writes records to that file. You can read this file with TI- Writer, but as you scroll down and read the screen MICROdex reads each record from the disk and displays the record. This is somewhat slow. Using the merge utility in the program I merged 10 years of files, converted the merged file to DV/80 and saved it to a PC disk via Smart Connect. Once in the PC, I can scroll through all 18 to 20 pages with considerable speed. Using the search routines on my word processor, I can locate topics or sort columns by key topics or numerically.

Sending PC files to the TI99/4A breaks the file into several text files that can be scrolled, edited, searched and modified. In other words, I can take all the records, compress them into a long text file on the PC or several short text files on the TI. I am sure this technique can be used to make other program's files more manageable.

One curious but understandable problem with files written a full 80-character width on the TI is, when transferred to a PC, the word processor's right and left margins must be reset so the lines stay intact and don't wrap. You may also have to change the page offsets to maintain line integrity.

Documentation: The manual, thorough and easy to understand, comes on the disks and occupies 50 sectors on a DSSD disk along with an instruction printing program. I did discover a few "bugs" or oversights. The bug at the TI end is a statement to load the program by typing RUN "DSK1.OUTPUTASC". I found OLD DSK1.OUTPUTASC a more reliable boot. At the flashing cursor, type RUN and the program loads.

If you lock up the program or the cursor disappears, press Function 4 (clear) to restore it instead of rebooting. This usually occurs when you initially set up the system or type a file entry incorrectly at program prompt in the TI or PC file name.

The manual covers most hardware problems, but not the one I had. My PC is a BSR 386SX and I couldn't get the computers to handshake. Then it dawned on me, is my PC on "com 1" or serial port 1? My serial 1 port or com 1 is a 9-pin port. I bought 25- pin cables because my modem is 25-pin and so is the TI RS232/serial port. I had to operate out of "com port 2" on my PC. Harrison's PC programs had to be changed from com 1 to com 2 and I had to output to com 2 on my PC. You could get a 9-to-25-pin adaptor and save yourself some grief in trying to make a connection. My RS232 line is 50 feet long from the basement to my den and I have had no problems. I did not need a null modem in the line or reconfigure my lines. I use the cheapest cables money could buy.

Ease of Use: Once you solve the hardware problems, you just plug the RS232 cables into the TI and the proper PC port. Turn on the PC and load the program to receive (PCINPUT0 or transmit (PCOUTPUT) — this is quick if the PC's programs are on your hard drive. Turn on the TI and load the appropriate program, INPUTASC or OUTPUTASC, and wait for the cursor. Put a disk into both computers with the files you wish to transfer. At the prompt, type the PC drive letter, filename and extension, then the TI disk number and filename. If you receive no error message, sit back and watch the transfer, as it is fairly fast. From the TI keyboard you can load or save to any letter or designated drive A, B, C on the PC.

Value: Smart Connect to me is invaluable as it makes my TI99/4A and BSR 386SX text file compatible. It allows me to exchange, edit, spell check and grammar check TI files with ease. Harrison Software has done an elegant job of programming and filling a need. I recommend this program to anyone who plans to use an IBM PC or clone. The TI community owes Bruce Harrison a big thanks. The $10, a mere pittance, includes shipping and handling. Thank you, Bruce, you have added another aspect to our TI and its longevity.

Newsbytes

Harrison won't vouch for Myarc compatibility

Bruce Harrison of Harrison Software says none of that company's products except its MIDI-Master music will be guaranteed to work on any system containing Myarc products.

"We're sorry for our potential customers who may be inconvenienced," Harrison says, "but we feel it's better if those who have Myarc equipment do *not* order software from us, rather than find through our software that Myarc products are *not* truly compatible with software written for the TI99/4A."

Harrison also notes that the company has reduced prices on most of its software items, "at least for the next few months."

For further information, write Harrison Software, 5705 40th Place, Hyattsville, MD 20781.

Texaments announces 'Super Summer Deals'

Texaments is offering "Super Summer Deals" featuring a bundled assortment of software titles at reduced prices.

Super Summer Deal No. 1 includes GIF Mania, the only GIF viewer/converter for the stock TI99/4A; TI Artist Plus!, a graphics design application; and Sound F/X, the audio playback system that produces digital sound through a standard monitor or television without any additional hardware. Programs in this bundle, available for $49.95 plus shipping, require 32K memory expansion, a disk system and either an Extended BASIC or Editor/Assembler cartridge.

Super Summer Deal No. 2 includes Sound F/X and six floppy disks containing sound bytes processed for playback through Sound F/X. Sound bytes include cartoon character voices and noises, popular science fiction clips and an assortment of miscellaneous sounds compiled from television and daily life. This package is priced at $21.95 plus shipping. The six sound disks are also available separately for $9.95 plus shipping.

Super Summer Deal No. 3 includes TI Artist Plus!, GIF Mania and a randomly selected two-disk Artist's Companion (from Texaments' collection of Artists Companions No. 2 through 13) for $39.95. Each Artist's Companion contains a unique assortment of fonts and graphics designed specifically for TI-Artist.

These packages can be ordered by sending a check or money order to Texaments, 53 Center St., Patchogue, NY 11772. C.O.D. orders can be placed by phone at (516) 475-3480. A shipping charge of $3.25 for domestic and Canadian delivery or $8.50 for foreign insured air mail delivery should be added to each order.

A free catalog (#E11) is also available from the above address.

TI fairs to highlight Halloween weekend

The Chicago TI International World Faire is scheduled for Oct. 31, to be followed by the Milwaukee Faire Nov. 1.

The Chicago Faire will be preceded by a social mixer from 8 p.m. to midnight Oct. 30. Admission to the mixer is $5. Admission to the exhibits and seminars from 9 a.m. to 5 p.m. the following day is $4. A banquet following the event from 7:30 to 9:30 p.m. is priced at $15. Site for the TI International World Faire is the Holiday Inn Elk Grove, 1000 Busse Rd. (Route 83), Elk Grove Village, Illinois.

For further information, contact Hal Shanafield Jr., 2515 Marcy Ave., Evanston, IL 60201-1111, (708) 864-8644.

Don Walden of the Milwaukee Users Group says the Milwaukee Fair will be at the same location as last year, the Quality Inn Motor Lodge across from the airport. For further information, contact Gene Hitz, Milwaukee Area 99/4A Users Group, 4122 North Glenway, Wauwatosa, WI 53222.

Delphi introduces new pricing plan

Delphi online service recently introduced a new membership option called the "10/4 Plan." Under the new plan, Delphi members receive their first four hours of evening access per month for $10, with additional time available for $4 per hour.

The 10/4 plan replaced Delphi's Basic Plan July 1. Delphi also continues to offer the 20/20 Advantage Plan. Members on this plan receive their first 20 hours of evening access for $20, with additional time at $1.80 per hour.

For a limited time, members can join the 10/4 plan with no sign-up fee. To become a member of Delphi, dial 1-800-365-4636 with your computer and modem, and press return twice. At the Password prompt, enter TEN4.

Mouse wrist support slides with mouse

The Mouse Paw, billed as the first wrist support for mouse users that slides with the mouse, has been released from Marty's Computer Workshop.

The support attaches with velcro (included in the package) to a computer mouse to provide continuous support for the wrist. According to Martin Connor, president of the company, the support can help users avoid Carpal Tunnel Syndrome by improving wrist posture.

The bottom suface of the Mouse Paw is a low friction material designed to slide easily on a mouse pad, desk or other surface the mouse is used on.

One edge is straight and attaches to flat-backed mice, while the other side is V-shaped and attaches with round-backed mice.

For further information contact Martin Connor or Julie Donnelly, Marty's Computer Workshop, P.O. Box 550, Cambridge, MA 02142-0004; telephone, 1-800-927-3504 or (617) 491-6935.

Static gets brushoff

The Static Release Cloth, originally developed for Hanna-Barbera Productions to alleviate static build-up on animation cels, has been reformulated for other applications, including video monitors, computers and peripherals and other sensitive electronic equipment.

The non-toxic cloth, sold as an 18x18-inch square with 32 wiping sides, retails for $6.95. Dealer inquiries are welcome. S/R Laboratories Inc. is located at 31200 Via Colinas, Westlake Village, CA 91361. Phone number is (818) 991-9955.

User Notes

Option 5 tip

This comes from King Turambar, a member of the FANATI'99 User Group of France. He writes:

I've read the item by Bruce Harrison in the July issue of MICROpendium. I hope this will help him.

I've been using RAG Linker for more than a year, and I can say this program is excellent and works very nicely. It is distributed with a library, RAGLIB, containing all the standard utilities — rewritten by RAG — as VSBW, VMBR, etc., even GPLLNK, but not LOADER.

Although this program may do very powerful things, I'll only show you the easiest way of using a bit of its power, enough for what is troubling Mr. Harrison.

When entering your assembly program, just put REFs for each utility you wish to use. When the assembly is done, load the RAG Linker.

First enter your object code filename (the object code is the file generated by the Assembler). Second, give DSKx.RAGLIB as the library name, then enter the filename of the program you wish to be generated. Finally, finish with your printer name, and miscellaeous options (generally not necessary for simple programs).

Then, your object code and the needed utilities of RAGLIB are loaded, joined together, and your option 5 program is generated by the linker. The utilities you have REFed are contained within the generated program, and it can now be run with no problem.

I also suggest that if you wish to know why you had so many troubles with GPLLNK, write to Art Green (RAG Software, 1032 Chantenay Dr., Gloucester, ONT K1C 2K9 Canada). He will certainly explain the GPLLNK secrets much better than I could.

Fibonacci routine too complex

This comes from Merle Vogt, of Van Ormy, Texas. He writes:

I am rather confused by the totally unnecessary complexity of that Fibonacci numbers program (July 1992, User Notes).

All that is needed is shown below:

```
5 REM FIBONACCI NUMBERS BY MERLE VOGT
10 DIM C(50)
20 C(2)=1
30 FOR X=1 TO 48
40 C(X+2)=C(X+1)+C(X)
50 PRINT C(X+2)
60 NEXT X
```

CRU addresses

This item, by Jan Alexandersson of Sweden, appeared in the newsletter of the Ozark 99ers (Springfield, Missouri).

Almost all cards in the expansion box use the same 8K addresses at CPU address >4000->5FFF. Only one card may be connected to these addresses at a time. This is handled by the unique TMS 9900 CRU ad

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1992 TI FAIRS

MARCH

T.I.C.O.F.F. (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire), 9 a.m.-4 p.m., March 14, Roselle Park High School, Roselle Park, New Jersey, $5. Contact Robert Guellnitz, Roselle Park Public Schools, 185 West Webster Ave., Roselle Park, NJ 07204, (908) 241-4550 (voice) or (908) 241-8902 (BBS).

APRIL

Northeast Computer Fair, April 4, Waltham High School, Waltham, Massachusetts, sponsored by TI99/4A User Group of the Boston Computer Society. Contact Ron Williams, 14 East St., Avon, MA 02322.

Dutch Annual TI-Fair, April 25, Utrecht, The Netherlands, sponsored by Dutch TI-Usergroup. Contact Drs. Erik C. van Wette, Hanninkhoek 39, 7546 AD Enschede, The Netherlands, phone: 31-53-778723.

Ottawa TI Fest, 10 a.m.-4 p.m., April 25, Merivale High School, 1755 Merivale Rd., Nepean, Ontario, Canada. Contact Ottawa Users Group c/o Bill Gard, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6; (613) 523-9396 (home); (819) 994-8856 (work); (819) 994-8873 (work, attn. DSE 2).

MAY

TI Orphan Reunion, 10 a.m.-5 p.m. May 9, Innisfail Lions' Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada, T0M 1X0, (403) 638-3916.

TI99/4A Users Group, UK, Annual Meeting, May 16, Princess Anne Training Centre, 10 Trinity St., Derby (Derbyshire, England). Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire England SK4 5H.

Multi User Group Conference, May 15-16, Ohio State University Lima Campus. Contact Lima 99/4A Users Group, P.O. Box 647, Venedocia, OH 45894 or phone Dave Szippl (419) 228-7109 or Charles Good (419) 667-3131 evenings.

SEPTEMBER

State of Washington TI Convention, Sept. 19, Tacoma, Washington. Contact Jim Tomkins, (206) 756-0934.

OCTOBER

7th Internationale TI-Computer-Treffen, Oct. 9-11, Wiesbaden, Germany. Contact Horst Wiese, Eleonorenstr. 6, DW-6200, Wiesbaden, Germany. Please enclose International Reply Coupons (can be bought at U.S. Post Office).

Chicago International World Faire, Oct. 30-31, Elk Grove Holiday Inn, Elk Grove Village, Illinois. Contact Chicago Users Group, c/o Hal Shanafield Jr., 2515 Marcy Lane, Evanston, IL 60201-1111, or (708) 864-8644.

NOVEMBER

Milwaukee TI Faire, Nov. 1. Contact Gene Hitz, Milwaukee Area 99/4A Users Group, 4122 North Glenway, Wauwatosa, WI 53222.

TI-Faire, Nov. 28-29, Ashfield Boys High School Hall (next to Western Suburbs Leagues Club), Liverpool Road, Ashfield, NSW, Australia. Contact TIsHUG (Australia) Limited, P.O. Box 1089, Strawberry Hills, NSW 2012, Australia.

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.

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.

User Notes

(Continued from Page 29)

dress bus. It is possible to use 16 difference cards by activating CRU addresss >1000, >1200 and so on up to >1F00. You should never activate two cards at the same CRU address. You may destroy the cards if you do that.

Here is a list of all the cards I know of and possible CRU addresses in hexadecimal:

Myarc HFDC (16 different)	1000-1F00
GRAM karte (16 different)	1000-1F00
Horizon RAMdisk (8 different)	1000-1700
P-GRAM (8 different)	1000-1700
CorComp RAMdisk (2 different)	1000,1400
Mechatronic 80-column	1000
Myarc RAMdisk	1000
TI disk controller	1100

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MICROpendium Disks, Etc.

- ☐ **Series 1992-1993 mailed monthly** (April 1992-March 1993) $40.00
- ☐ **Series 1991-1992** (Apr 1991-Mar 1992, 6 disks) ... $25.00
- ☐ **Series 1990-1991** (Apr 1990-Mar 1991, 6 disks) $25.00
- ☐ **Series 1989-1990** (Apr 1989-Mar 1991, 6 disks) $25.00
- ☐ **Series 1988-1989** (Apr 1988-Mar 1989, 6 disks) $25.00
- ☐ **110 Subprograms** (Jerry Stern's collection of 110 XB subprograms, 1 disk) $6.00

MICROpendium Index disks

- ☐ **MICROpendium Index** (2 SSSD disks, 1984-1991, Extended BASIC req.) $6.00
- ☐ **MICROpendium Index II** (8 SSSD disks—1 for each year 1984-1991, XB req.) $24.00
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(Continued from Page 30)

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Changing the battery on a Geneve

This item, by Dee Turner, appeared in the newsletter of the Pomona Valley 99ers of Chino, California.

I had to replace the battery in my Geneve recently. I guess after four years it was about time.

The battery in the Geneve is a 3-volt coin cell, part number 2032 and has solder tabs installed. So, since you have to replace the battery, you might as well install a battery holder. You can order it from DigiKey Corp., 701 Brooks Ave. South, P.O. Box 677, Thief River Falls, MN 56701-0677. The part number is BH600-ND, Coin Cell Holder — 20mm or BH906-ND for a 23 mm holder. The cost is $1.18 plus S&H. You can also call them at 800-344-4539.

I would not recommend trying to solder tabs on a new battery. They can explode when heat is applied. If you can't find a 2032 battery don't fret. I used a BR2020. The current capacity is smaller (100 Mili/Amp/Hours) as compared to the 2032 (165mAh) so it won't last four years, maybe only 3, but with a battery holder the next replacement is a breeze. The number 2020, 2032, etc. is the size of the battery. That means that a 2020 battery is 20 mm in diameter and 2 mm thick.

When replacing the battery — if you have trouble with the plus lead solder pad as I did — it connects to the anode (non-banded end) of CR-10. I pulled the solder pad off and, since it is inside the board and difficult to repair, I just ran a wire from the plus terminal of the battery holder to the anode of CR-10.

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