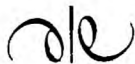




T. I. S. H. U. G.

SYDNEY

NEWS



DIGEST

Newsletter of the
Home Computer
Texas Instruments
Users Group
APRIL '83



International
99/4
Users-Group



EDITORIAL

with *Shane A*

Greetings from all of us at T.I.S.H.U.G. (TI.SYDNEY HOMECOMPUTER USER GROUP), and a special greeting to those who have recently joined this, your group. The contributors to this months SYDNEY NEWSDIGEST as... T.I.U.F. (TI.Users' of Perth)Western Australia, INTERNATIONAL USERS' GROUP in Oklahoma, and the OHIO Users's group. In particualer, I wish to say a special THANKS to BERNIE ELSNER for his assistance, in providing me with SCREEN DUMP UTILITIES and other programmes which will help us here at T.I.S.H.U.G. to produce an even better & fuller publication. Because of the above mentioned groups, plus local contributors, we have a bumper issue this month.

I should also mention that our friend, JOHN VOLK, (CO-ORDINATOR @ ARKANSAS USERS' GROUP) has provided us with some good programmes, which we'll be sharing with you shortly. John & I have been good friends since I created the User Group in Sydney over 2 years ago. We have constantly been exchanging software & ideas during this time. Hi! John. This publication not only goes to our 260+ members, but also goes to each STATE CO-ORDINATOR of TI groups in Brisbane, Melbourne, Adelaide, Tassy, & Perth...but is sent to other TI USER GROUPS around the U.S.A., ENGLAND, & EUROPE.

OUR NEXT MEETING WILL BE SATURDAY AFTERNOON THE 9th APRIL (2pm-4:30pm) at St. John's Church HALL, Victoria St, DARLINGHURST. At the last meeting, we You'll be able to pick up your copies of the 99'ER MAGAZINE, and your CLUB SOFTWARE TAPE... (see page 4 for more information).

OUR MAY MEETING: We have ANDREW NUTTING, JOHN ROBINSON & BRIAN LEWIS sharing with us the fun & frustrations of MODEM COMMUNICATION, as they chat to each other and down-load programmes etc with their Computers via their TELEPHONE. This will be one meeting you won't want to miss. More news about that in the next issue of this SYDNEY NEWSDIGEST.

JUNE MEETING: Will be our half-yearly FULL DAY TUTORIAL/WORKSHOP. This will be an opportunity for you to bring along your own computer to the hall & learn all about programing, or share with others your experience with programming. Last year, it proved a brilliant success with over 30 computers in one hall as we studied together.

AT OUR LAST MEETING... We completed a QUESTIONARE about tutorials for YOU THE USER. For those who were unable to make that meeting, we have attatched that QUESTIONARE for you to fill in and send it to us by return mail. We found that members at that meeting wanted us to conduct PROGRAMMING TUTORIALS in PRIVATE LESSONS, SMALL GROUP SESSIONS & PROGRAMMING RETREATS. But to gain a fuller picture of your needs, please fill in the attached QUESTIONARE.

THINGS ARE LOOKING GOOD with software for the TI-99/4(A) COMPUTER. MILTON BRADLY will be coming to Australia this month, and I have spoken to a representative of that company regarding software...more about that next month. THORN-EMI & TOLTOYS are now producing software for us, and more information will hopefully be available, also next month.

NOW LETS LOOK AT WHAT WE'VE PUT TOGETHER THIS MONTH WITHIN YOUR NEWSDIGEST

- PAGE 2...BIGGIES' BITS (programmes, & NEWS FROM TEXNET).
- PAGE 3...MORE BIGGIES' BITS.
- PAGE 4...CLUB SOFTWARE, PLATO, article entitled "WIVES DON'T COUNT..."
- PAGE 5...MYSTERY PROGRAM, TI-99/4(M)?, SIBERIAN INSTRUMINSKI, CONVERTING TANDY COLOUR PRINTER FOR OUR TI part#1.
- PAGE 6...LISTING TO DISK + MINIMEM, MACHINE GUN PRINTING.
- PAGE 7...UNTANGLED 'LINES' - MINIMEMORY SPECIAL.
- PAGE 8.& 9...'LINES' - SOURCE LISTING.
- PAGE 11..NEW TI HARDWARE.
- PAGE 13,14MORE GOODIES.

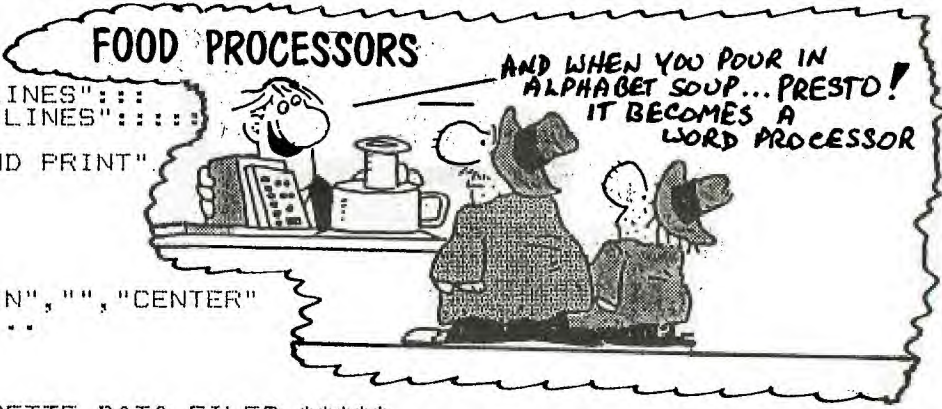


JENNY & THE GANG RETURN IN THE NEXT ISSUE OF THE SYDNEY NEWSDIGEST, AND WE WOULD LIKE TO HEAR FROM YOU.

CLUB ADDRESS: P.O. BOX 149 PENNANT HILLS, N.S.W. 2120 Tele (02) 8480956
PROGRAMMERS CRISIS LINE..... (02) 992229.
PUBLICATION : P.O. BOX KX101, KINGS CROSS, N.S.W. 2011
ACTING COORDINATOR: Brian Lewis, SECRETARY: John Robinson, TREASURER: Terry Philips
EDITOR: Shane Andersen, LIBRARIAN: Manual Constantinidis, CRISIS LINE: Graem Hollis
EDUCATION CO-ORDINATOR: Peter Lynden. ASSISTANT CHAIRPERSON: Peter Varger.

```

20 REM PRINTING TRICKS
30 REM By Jim Peterson
40 CALL CLEAR
50 PRINT :: "Judging from some published" :: " programs I've seen some" :: " people
don't know these" :: :: ::
60 FOR DELAY=1 TO 1000
70 NEXT DELAY
80 CALL CLEAR
90 PRINT "PRINT AND SKIP 2 LINES" :: ::
100 PRINT "PRINT AND SKIP 4 LINES" :: :: ::
110 PRINT "PRINT"
120 PRINT :: "SKIP 2 LINES AND PRINT"
130 PRINT "DON'T SKIP";
140 A=1
150 PRINT " DIDN'T SKIP";
160 PRINT A
170 PRINT "LEFT", "CENTER"
180 PRINT :: "", "START", "", "IN", "", "CENTER"
190 REM RUN to see results...
200 END
    
```



```

100 REM ***** CREATING CASSETTE DATA FILES *****
110 REM REPRINTED IN PART FROM PIONEER VALLEY USERS GROUP
120 REM CAN BE USED AS A SUBROUTINE IN MANY PROGRAMS
130 REM 656 BYTES USED...13888 BYTES REMAINING
140 REM LIBRARY FILE
150 CALL CLEAR
160 OPEN #1:"CS1", INTERNAL, FIXED 192, OUTPUT
170 FOR I=1 TO 100
180 READ TITLE$, AUTHOR$, CRDATE
190 IF TITLE$="THE END" THEN 220
200 PRINT #1: TITLE$, AUTHOR$, CRDATE
210 NEXT I
220 PRINT #1: "THE END", "MR. NOBODY", 2000
230 CLOSE #1
240 DATA "BASIC FUN", "LIPSCOMB/ZUANICH", 1982
250 DATA "BASIC COOKBOOK", "TRACTON", 1982
260 DATA "30 BASIC PROG...", "CHANCE", 1981
270 DATA "THE END", "NOBODY", 2001
280 REM ENTER YOUR OWN DATA
290 END
    
```

```

100 REM WINDOW/A
110 REM LINDSAY PREECE
120 REM
130 CALL VCHAR(1,1,31,768)
140 CALL SCREEN(2)
150 C1=33
160 R1=25
170 CH=31
180 COUNT=0
190 R=R+1
200 C=C+1
210 C1=C1-1
220 R1=R1-1
230 R2=R1-COUNT
240 C2=C1-COUNT
250 CH=CH+8
260 CALL VCHAR(R,C,CH,R2)
270 CALL VCHAR(R,C1,CH,R2)
280 CALL HCHAR(R,C,CH,C2)
290 CALL HCHAR(R1,C,CH,C2)
300 IF CH=127 THEN 330
310 COUNT=COUNT+1
320 GOTO 190
330 REM COLOR + CHARACTER
340 A=A+1
350 B=B+1
360 IF A<>13 THEN 380
370 A=1
380 IF B<>17 THEN 400
390 B=1
400 CALL COLOR(A,B,B)
410 GOTO 340
    
```

```

100 CALL CLEAR
110 REM RETRIEVE LIBRARY DATA SUBROUTINE
120 PRINT :: " BIGGIES' LIBRARY FILES" :: :: :: ::
130 REM LINE 110 YOUR OWN FILE NAME
140 OPEN #1:"CS1", INTERNAL, FIXED 192, INPUT
150 REM CALL CLEAR
160 FOR I=1 TO 100
170 INPUT #1: TITLE$, AUTHOR$, CRDATE
180 IF TITLE$="THE END" THEN 210
190 PRINT : TITLE$, AUTHOR$, CRDATE
200 NEXT I
210 CLOSE #1
220 END
    
```

```

10 CALL CLEAR
20 PRINT " PERHAPS SOME PROGRAMERS" :: "DO NOT REALIZE HOW RND CAN" :: "BE USED
IN STATEMENTS" :: :: ::
30 REM
40 FOR DELAY=1 TO 1000
50 NEXT DELAY
60 CALL CLEAR
70 FOR A=1 TO 16
80 CALL COLOR(A,A,A)
90 NEXT A
100 RANDOMIZE
110 CALL HCHAR(INT(24*RND)+1, INT(28*RND)+3, INT(121*RND)+32, INT(10*RND)+1)
120 CALL VCHAR(INT(24*RND)+1, INT(28*RND)+3, INT(121*RND)+32, INT(10*RND)+1)
130 CALL SOUND(INT(500*RND)+100, INT(1000*RND)+110, 5)
140 CALL SCREEN(INT(15*RND)+2)
145 GOTO 110
150 REM FUNCTION 4 TO STOP
160 END
    
```

Category: TI-99/4
 Subject: TI NEWS AT THE CES SHOW
 From: TI0511
 Posted: 9 JAN 11:20 pm

<N>ext, <PD>st, or Return for text-
 re is the truth about what was at the
 Las Vegas CES show in the TI area.

The new computers are at a different
 level than the 99/4. They are the 99/2
 and the CC 40.

The 99/2 retails under \$100, has solid
 state software, built-in modulator, 4.2K
 built-in memory, plug-in 16K and 32K
 memory and, it will use the new
 peripherals developed for the CC 40
 computer.

PS: It has a full sized 48 key keyboard,
 with real keys (unlike the TIMEX).

The CC-40 is explained in the next
 message, not enough room left here!

Subject: TI NEWS PART II
 From: TI0511
 Posted: 9 JAN 11:30 pm

<N>ext, <PD>st, or Return for text-
 new CC-40 is a new Compact Computer
 that looks GREAT! It was the following
 plus much more:

- 1) 31 character built-in display
- 2) Battery power capability
- 3) Solid State Software
- 4) 99/4 compatible Basic
- 5) Full keyboard with 10 key pad
- 6) Peripherals:
 - a) 4 color printer/plotter
 - b) RS232 interface
 - c) A Wafertape Drive system
 (a small tape cartridge system
 that stores up to 48K on a
 small wafer thin tape cartridge)
- 7) Weight is 22 ounces, size 9.25 x 5
 5.75 x 1.00 inches
- 8) Suggested retail: \$250

SEE PART III FOR 99/4 INFO

Subject: TI NEWS PART III
 From: TI0511
 Posted: 14 JAN 1:23 am

<N>ext, <PD>st, or Return for text-
 rry for the wait. Someone must have
 deleted my PART III, it was posted the
 same night.

New for the 99/4 is minimal. There is a
 'EX-BUS adapter that will enable you to
 connect the new CC-40 peripherals and a
 GREAT
 new game adapter from Milton
 Bradley. The game adapter features great
 graphics and, are you ready, VOICE
 COMMAND. There was no new big brother to
 the 99/4 released as was hoped and
 rumored by many. We will have to wait
 for the Summer CES in Chicago. Drop a
 note to TI0511 if you have any further
 questions.

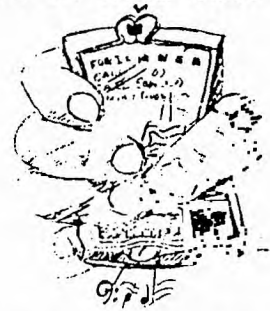
PS: Do not expect to be able to get any
 of the new goodies until Summer! You all
 Know TI.

Sub Octave sub routine

```

100 REM      THIS PROGRAM WILL PLAY AND PRINT THE FREQUENCIES FOR TWO ADDITIONAL
OCTAVES OF BASS NOTES ON THE TI 99/4A. USE THEM AS SHOWN IN LINE 160. JIM PETER
SON
110 DEF R(X)=INT(X+.5)
120 F=1652
130 FOR J=1 TO 25
140 READ N$: "=":R(F)
150 PRINT N$;"=":R(F)
160 CALL SOUND(500,22000,30,22000,30,F,30,-4,0)
170 F=F/1.059463094
180 IF J<>12 THEN 200
190 RESTORE
200 NEXT J
210 DATA A,B flat,B,C,C#,D,E flat,E,F,F#,G,A flat,A

```



```

100 REM      THIS PROGRAM PLAYS TREMOLO NOTES. CHANGE VALUE IN LINE 150 TO 1.01 OR
1.03 FOR MORE OR LESS TREMOLO. ST. JAMES INFIRMARY BLUES - JIM PETERSON
110 FOR J=1 TO 60 STEP 2
120 READ A,B
130 FOR L=1 TO A
140 CALL SOUND(-99,B,0)
150 CALL SOUND(-99,B*1.02,0)
160 NEXT L
170 NEXT J
180 DATA 2,330,2,294,4,330,4,294,4,330,4,294,4,262,8,220
190 DATA 2,330,2,294,6,330,2,294,4,330,4,262,12,247
200 DATA 2,294,2,262,4,294,4,262,4,294,2,330,2,294,4,262,8,220
210 DATA 4,262,4,262,4,220,4,262,4,247,16,220

```

```

100 REM      WORLD'S SHORTEST TIC-TAC-TOE PROGRAM, BY RUSS WALTER IN THE SECRET GUID
E TO COMPUTERS VOL. C2

```

```

110 PRINT "LET'S PLAY TICK-TACK-TOE":
"THE BOARD IS NUMBERED:"
120 PRINT "1 2 3": "8 9 4": "7 6 5": "I
MOVE TO 9": "WHERE DO YOU MOVE TO?"
130 INPUT S
140 DEF FNM(X)=X-4+4*SGN(8.5-X)
150 C=FNM(S+1)
160 GOSUB 230
170 C=FNM(S+6)
180 IF S/2=INT(S/2) THEN 280
190 GOSUB 230
200 PRINT "I MOVE TO":FNM(S+4)
210 PRINT "THE GAME IS A DRAW"
220 STOP
230 PRINT "I MOVE TO":C
240 PRINT "WHERE DO YOU MOVE TO?"
250 INPUT H
260 IF H<>FNM(C+4) THEN 280
270 RETURN
280 PRINT "I MOVE TO":FNM(C+4); "AND WIN"
290 END

```



```

100 REM A GLIMPSE OF REALITY
110 REM FOR COMPUTER ADDICTS
120 REM
130 REM BY PHIL WEST. TIUP.
140 REM
150 CALL CLEAR
160 CALL CHAR(96,"10181B3C3C
7E3C18")
170 CALL CHAR(112,"FFFFFFFF
FFFFFFFF")
180 CALL CHAR(120,"FFFFFFFF
FFFFFFFF")
190 CALL CHAR(121,"55555555
55555555")
200 CALL CHAR(122,"5D5D5D5D
5D5D5D5D")
210 CALL CHAR(128,"000011925
43BFF5D")
220 H=22
230 CALL COLOR(9,16,1)
240 CALL COLOR(11,2,2)
250 CALL COLOR(12,13,1)
260 CALL COLOR(13,14,1)
270 CALL VCHAR(4,16,112,3)
280 CALL HCHAR(4,17,112,3)
290 CALL VCHAR(4,20,112,18)
300 CALL HCHAR(22,1,120,96)
310 CALL HCHAR(3,18,112)
320 CALL HCHAR(2,17,112,3)
330 G=0
340 H=H-1
350 FOR Z=7 TO H-1
360 CALL VCHAR(Z,16,96)
370 CALL VCHAR(Z,16,32)
380 NEXT Z
390 G=G+1
400 CALL SOUND(15,(H*50),2)
410 CALL HCHAR(H,6,121)
420 IF G=32 THEN 330
430 IF H=7 THEN 440 ELSE 350
440 FOR F=3 TO 30 STEP 3
450 CALL HCHAR(7,F,128)
460 CALL VCHAR(8,F,122,14)
470 CALL SOUND(15,(F*50),2)
480 NEXT F
490 PRINT "NOW DO SOMETHING
ABOUT IT!!!"
500 GOTO 500

```

```

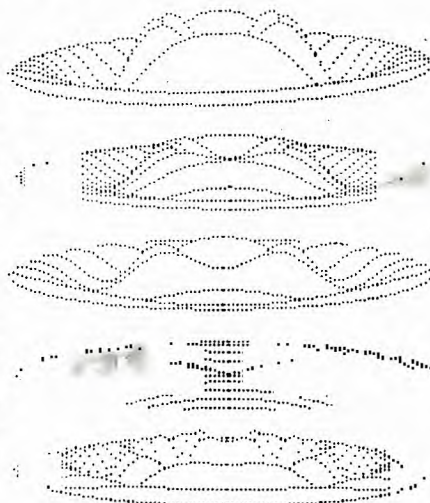
50 REM ***** WALKING MAN BY ROGER WILLS
100 CALL CLEAR
110 CALL SCREEN(16)
120 CALL CHAR(104,"18187E1818242424")
130 CALL COLOR(10,15,16)
140 XOLD=15
150 YOLD=13
160 CALL JOYST(1,DX,DY)
170 XNEW=XOLD+DX/4
180 YNEW=YOLD+DY/4
185 IF (DX=0)*(DY=0) THEN 210
190 XNEW=INT(32*((XNEW-1)/32-INT((YNEW-1)
)/32))+1
200 YNEW=INT(24*((YNEW-1)/24-INT((YNEW-1)
)/24))+1
205 CALL HCHAR(YOLD,XOLD,32)
210 CALL HCHAR(YNEW,XNEW,104)
220 XOLD=XNEW
230 YOLD=YNEW
240 GOTO 160
) REM 592 BYTES USED***13952
BYTES LEFT***(ED)

```

3D-PLOT FROM
'TIDINGS'

Just before Christmas we received a new "TIDINGS" from the U.K. users group TI-HOME. Seventy-five pages of interesting TI-99/4(A) ideas and information.

One program that caught our eye, was a TI-BASIC program that draws THREE-DIMENSIONAL PLOTS. Being in BASIC it is rather slow but a couple of REAL computuners were seen sneaking in and out of the computer room on Christmas day, trying out different parameters to produce the following screen dumps :-



SOFTWARE

Before I talk about the CLUB SOFTWARE for this month, I should mention that as of this month, we are unable to accept BLANK TAPES in exchange for your club software tape. The reason being that, some of the tapes handed in to us for exchange, have been of such low quality, that we have been unable to re-use them. Instead, there will be a slight charge as follows... \$3.00 to cover the cost of tapes we have purchased, and to help us pay off a new dual-tape fast speed recorder. FOR THOSE WHO ARE UNABLE TO ATTEND THE MONTHLY MEETINGS, AND REQUIRE THIS MONTHS TAPE BY POST, PLEASE ADD ANOTHER \$1.00 TO COVER POSTAGE/PACKING. TAPES ARE AVAILABLE MONTH OF ISSUE ONLY, however, if you send us a program that you have written, we will give you any 3 programmes of your choice, from our extensive range. A list of these programmes is being made up and will be available shortly.

AND NOW FOR THIS MONTHS PROGRAMMES...

LOTTO.....(TI BASIC)By Manual C. This program can be use with LOTTO, and POOLS.It features good graphics and is well presented on the screen.

MINI ORGAN(TI BASIC)By IGOR KRIMOTAT-Younger Set member.A very good music and Graphics display that we know you'll enjoy.

CRICKET...(EX BASIC)Runner-up in the AUSSIE SOFTWARE AWARDS,this program by Rob Williams,is good sporting entertainment with full graphics.

ADVANCE AUSTRALIA (EX BASIC)and written also by one of our own members, RUSSEL NELHAM has done a good job with both graphics and music for our NATIONAL ANTHEN.

ETI.....Yes it's E.T.,in good graphics,by BERNIE ELSNER of the PERTH(WA) GROUP.You can use the TE#2 & SYNTHESIZER,if you want ET to talk, This program will also run in TI BASIC, and for those who have PRINTERS,you can do SCREEN DUMPS with either the MINI MEMORY,or EXTENDED BASIC.(however, if you require the utilities to do your screen-dump,please contact SHANE at the publications address: PO BOX KX101,KINGS CROSS,NSW 2011 for a copy on diskette).

E.T. PHONE HOME.

NEXT MONTH...

will include such programmes as, TUCKERBOX(TIBASIC MUSIC), FIREBALL (EX BASIC EDUCATIONAL), INVASION (EX BASIC GAME), GAME STACK(EX BASIC STACK OF 7 GAMES)

FOR ALL MAIL ORDERS,please send to club po address at Pennant Hills.



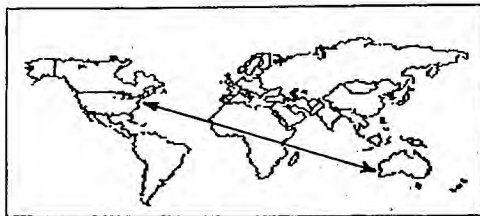
PLATO COURSEWARE BOOM OR BUST?

The PLATO* courseware series of programs will soon be available to 99/4 and 99/4A owners who have disk systems. Developed by Control Data Corporation for use in schools primarily via terminals from remote main frame computers, PLATO has been years in the making at a cost of millions of dollars.

The 108 PLATO courseware packages cover reading, mathematics and grammar in the Basic Skills for grades 3 - 8 and mathematics, writing, science, social studies and reading in the High School Skills for grades 9 - 12 should be a wel-

come addition to anyone's software line. PLATO packages however may not be as successful as both TI and CDC think they will be.

There are several reasons why we think that the overall PLATO program will be a BUST! One is the initial cost of the equipment to get started with PLATO. The users system will need to include a disk system (about \$650) to RUN the very first program. Second is the cost of the PLATO packages themselves. \$49.95 per package is no real bargain and that did not include the cost of the module you must purchase to operate any of these programs. Third, please tell me any dealer or distributor who is going to take on 108 individual new unproven packages of anyone's software? That is if TI can get them out on time, which to this point, as we all know is a real joke. Finally the overall quality of what we have seen so far is well below even the early Scott Foresman Modules that sell below the cost of any of the PLATO products.



Wives don't count in computer game

Daily News Special Service

LONDON: It started, as love affairs tend to, very innocently: Nicholas Smith, (34) began reading a magazine article on how to build your own micro-computer.



SCREEN GETS SEX BLAME

LONDON (AAP): Computer screens can play havoc with your sex life, according to a report by the Equal Opportunities Commission.

The commission says the stress of operating visual display units leaves many workers with little appetite for sex.

Ursula Huws, author of the survey, said: "One of the effects of stress on people is to cause impotence in men and lack of interest in sex in women."

"The stress is caused by the problems of trying to keep pace."

"People feel shattered after a day in front of one of those screens 45 centimetres away from their eyes."

The survey also showed that workers operating the screens were more prone to headaches and eye trouble.

In a few minutes were sown the seeds of what was to become an all-consuming passion. Four years later, after a day at the office he rushes not to the arms of another woman but back to the dining room of his tidy unit in South Ruslip.

He plays for hours with micro chips and wires in a computer world all his own. His devotion to the new love of his life has driven his attractive wife Shirley to the point of despair.

Like most affairs it was just a bit of fun for Nick, a project analyst with British Gas.

But it was no fun at all for Shirley competing for her husband's attentions with a handful of microchips.

"At times I could scream," she says. "Ever since he got interested in

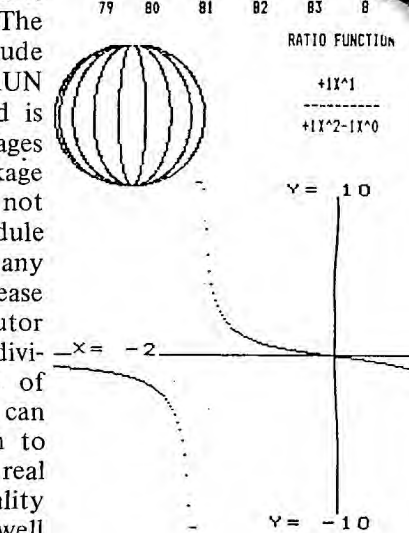
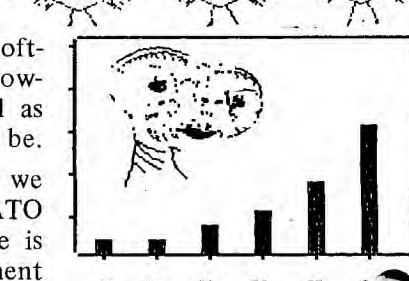
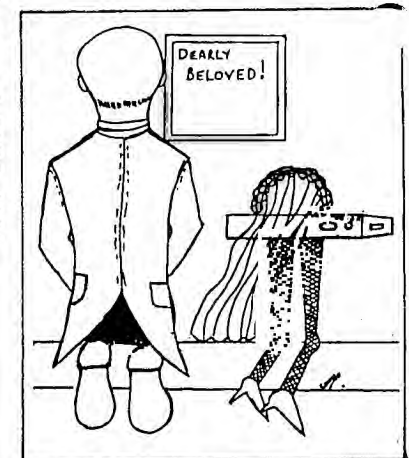
micro-computers, I've hardly seen him. Sometimes he doesn't get to bed until the early hours of the morning."

Shirley Smith is not untypical. In America—already full of golf widows—the computer widow is an increasingly familiar figure in the offices of marriage counsellors, where home computers are said to be the newest cause of broken marriages.

Peter Rodwell, editor of Personal Computer World, says Britain won't be far behind. "We are buying and building home computers faster than anywhere else in the world, including America," he said.

"We own more home computers—750,000—at the latest count—per head of the population than any other country."

"Of course, they are bought almost exclusively by men."



This is a MINI-COMPETITION for new members. All you have to do is work out what the following program does...

First prize is a copy of 5 new TI-BASIC or EXT.BASIC programs (different to the other competition). If there are two entrants we may even have a second prize.

Conditions of entry are the same as the "WHAT'D HE SAY" competition, elsewhere in this issue. Send your entries to "PROGRAM" P.O. Box 246 Mt.Lawley 6050. Why not enter both competitions? They close after our next meeting (19th. Feb.) This is the only way to see the programs until our software library is fully set up.

ED.ASS.

```
100 CALL VCHAR(1,1,31,76B)
110 DATA .01,4.1,.03,3.2,.42
.4,7
120 DATA 4,37,4,39,8,44,4,33
.4,37,8,44,4,33,4,37,8,44,4,
59,4,49,6,44,2,37,2,33,2
.29,4,2,33,2,37
130 DATA 8,44,4,33,4,37,8,44
.4,74,1,148,1,132,2,117
.5,117.5,2,117.5,2,117
.5,2,99,2,88,2,99
140 DATA 1,117.5,1,132,2,148
.2,157,2,148,2,132,2,4000,2,
37,2,39,1,117.5,1,132,2,
148,2,157,2,148,8,117.5
150 DIM A(2,50)
160 FOR B=1 TO 50
170 READ C,D
180 A(1,B)=C*100
190 A(2,B)=D*10
200 NEXT B
210 FOR B=1 TO 3
220 FOR C=A(1,B) TO A(2,B)
230 CALL SOUND(A(1,C*3),A(2,
C*3),0)
240 NEXT C
250 NEXT B
260 GOTO 210
```



In the days when MOTOR VEHICLES were the big thing in my life, I never felt at "ease" with a particular car until I had, at least once, dismantled and reassembled the motor or gearbox.

That feeling was transferred to my interest in computers. With a little help from a Cobber, (see TITBITS MAN OF THE YEAR elsewhere in this issue) I have delved into the inner workings of my TI-99/4 and performed a little "TRANSPLANT" operation.

Anyone who has the old computer and purchases a MINIMEM module soon finds out that you cannot run the demonstration program LINES on the TI-99/4. Frustration immediately sets in. The reason it will not run is because it is designed for the 4A computer which has an improved VDP chip with an extra graphics mode.

All Australian TI-99/4 computers, use the TMS9918 VDP chip and if you can get hold of the improved TMS9918A VDP chip, it is a relatively simple job to swap them.

The change allows you to run "LINES" on the CANBERRA/ CONVERTED PAL-D/NTSC monitor which gives a very sharp and steady screen full of LINES. One would also be able to produce ASSEMBLY LANGUAGE programs with the MINIMEM to make use of the new "GRAPHICS II" mode.

One DISAPPOINTMENT with the change is that the TI-99/4M (for Modified), will NOT repeat NOT run the new games module PARSEC. There must be a few other changes in the 4A that will stop us from running new software.

At one stage I had hoped to add a modified KEYBOARD to the 4M but investigation of both computers has convinced me that it is not a job for "mere mortals".

As a further trial we have changed chips on Ken Hopkins and Rob Williams' computers without any problems. There is a possibility that some EARLY computers may not have the VDP chip SOCKETED, if that is true it would cause a few problems. One other thing required for the swap is a tube of HEAT CONDUCTIVE PASTE which is needed to re-establish thermal contact between a couple of chips and the heat sinks on the shielding that surrounds the main computer board.

```
1 TS="IA1EIK1K1K1K1E1A1A1E6K
IK1PIUIUIUIUI1.1.1U6P1.1XIU
IUUIUIPIK1K1K1E1E1E1E1P
IK1I1E1A1A1K1P1UIPIE1I5K"
2 FOR I=1 TO 98 STEP 2
3 CALL SOUND(VAL(SEG*(T$,I,1))
)*200,(ASC(SEG*(T$,I+1,1))-
36)*10,0)
4 NEXT I (PHIL WEST)
```

If there is sufficient interest from members, we can take steps to approach TI in SYDNEY (in conjunction with other state user groups) for a "DNCE ONLY" purchase of some TMS9918A VDP chips. Realising how valuable the USER GROUPS are to them, TI would undoubtedly give us a "COST PRICE" deal!

With sufficient chips to hand we could organise a WORKSHOP meeting to carry out the transplants. The last two modifications took 30 minutes from start to finish. Rob's frowns of concentration turned to gleeful WHOOPS of joy as the Ed. Ass. breathed life back in to his pride and joy and a blaze of brilliant coloured lines burst onto the screen. (What great courage it takes to allow a "QUACK" to meddle with the insides of your 2nd most precious family member.)

One last point, it is not unreasonable to expect a company with the stature of TEXAS INSTRUMENTS, at some time in the future, (when the supply situation eases) to make some sort of "TRADE-IN" offer on a new 4A computer, so a conversion may be a waste of time. For my part, I have an affection for my TI-99/4 far in excess of its residual value and I don't think I will ever part with it. The NTSC/ CONVERTED TV set may come in very handy in the future to run another NTSC computer.

There you have it, if anyone is interested in converting their computer, let me know before or at, the next meeting (Feb. 19th.) and given sufficient numbers, we will organise a MASS CHIP EXCHANGE. (All care taken but no responsibility for any damage that may occur!)

ED.ASS.



```
100 REM FROM TISHUG SYDNEY.
110 REM
120 DIM S(28)
130 F=262
140 FOR N=0 TO 27
150 S(N)=INT(F*1.059463094^N)
160 NEXT N
170 S(28)=32000
180 M$="cKcKcMeJaKcMcDcDcPeD
aMcKcMcKcDgK"
190 FOR J=1 TO LEN(M$)STEP 2
200 CALL SOUND((ASC(SEG*(M$,
J,1))-95)*120,S(ASC(SEG*(M$,
J+1,1))-64),5)
210 NEXT J
```

I realised that I didn't have a clue about COMPUTERS in the USSR. Do they have personal computers ??? Perhaps there is a.....



SIBERIAN INSTRUMINSKI

Ivan Computernutskov enters his local COMPUTSKI store to see if any accessories have arrived for his SIBERIAN INSTRUMINSKI, SI-55/40, 10 bit computer. Over the secret microphone you hear,

"Greetings comrade Mikelyev Fordski. Have my MUNCHSKI or SI-AFGHANI modules arrived?"

"Nyet"

"What about my JOYSTIKSKIS?"

"Nyet"

"The new REVOLUTIONARY BASIC module?"

"Nyet"

"Well then, what about the RED BALLET module?"

"Nyet"

"Excuse me comrade, what DO you have in stock?"

"We have plenty of TEACH-YOUR-SELF SI basic, and some programovich teaching aidski No.1 cassettes."

"Look comrade, my cousin Olga in Murmansk is thinking of getting a SI-55/40 soon, do you have any computski in stock?"

"Nyet"

"Fair go comrade, why in heavens name not?"

"Well comrade it's a sad story. They have plenty of computski in Moscow but they don't have any UHFMODULSKIS to go with them. They are coming by AEROFLOT from Cuba in the next couple of weeks."

"Gee comrade. I don't know why I ever bothered to get involved with computskis. I should have spent my ROUBLES on vodka and caviar instead."

"Now listen here, comrade Computernutskov, rather than grumble and complain all the time, you should be more appreciative of the HIGH-TECHNOLOGISKI that is available to you. Siberian Instruminski have just announced three new computskis and a whole host of new accessories in their next FIVE-YEAR plan. What more could you wish for?"

"How about an EXPANSKIROX"

"Sorry. We're out of stock at the moment but they'll be here next Tuesday. Next please!"

A little while later, Ivan is seen trudging through the snow carrying a bottle of Vodka and muttering to himself,

"Computski 20#/*!\$%*!!..... Sheeeeeeshski...SI @*!!#x..."

GUP ED. ASS.

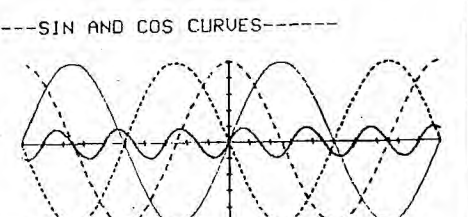
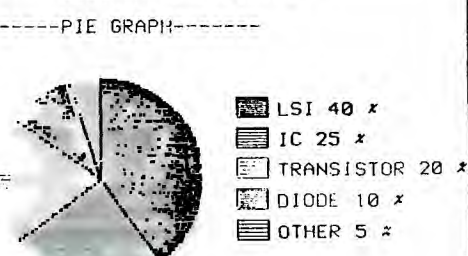
ANOTHER RS232 SUCCESS STORY

Latest device that we have succeeded in getting to work via the RS232 interface is a "RADIO SHACK" (TANDY) CGP-115 COLOR GRAPHIC PRINTER. The ED.ASS. (using experience gained on CPUg's printer!) fitted a 3 pin DIN plug into a 4 pin DIN socket and soon had it printing in its four colors. Alex Clemen then spent some time converting the TRS80 basic to EXT.BASIC.

Finally, the PREECE/ELSNER team debugged the PIE/CHART demo program and you can see the result (minus colors). We hope to have the printer on show at our next meeting.

SEE PAGE 11 FOR PROGRAM TO USE WITH YOUR CONVERTED TANDY PRINTER.NEXT MONTH WE'LL SHOW YOU HOW TO MAKE THE CONVERSION

COLORGRAPHICPRINTER



LISTING TO DISK + MINIMEM TOO!

It is funny how long one can be using this equipment and not realise some important facility is available.

A chance remark by Ken Hopkins a couple of weeks ago made me aware that it is possible to LIST a program to DISK. Just key in LIST "DSK1.FILENAME" and your program listing is written to DISK as a DISPLAY-VARIABLE-BO file.

The next question is, what can one do with the LISTING.

Well for starters it is now possible to write a very short program that will print the LISTFILE to any printer in whatever number of columns is required.

```
100 REM PRINT DISK LISTINGS
110 REM TO RS232/2 INTERFACE
120 REM
130 CALL CLEAR :: DISPLAY AT
(12,1):"HOW MANY COLUMNS ? 2
B " :: ACCEPT AT(12,20)S
IZE(-3)VALIDATE(DIGIT)BEEP:N
140 DISPLAY AT(14,1):"FILENA
ME IS DSK1. <"::
```

```
" :: ACCEPT AT(14,18)BEEP SI
ZE(-10):F$ :: F$="DSK1."&F$
150 OPEN #1:F$ :: OPEN #2:"R
S232/2.BA=9600.DA=8",VARIABL
E N
160 LINPUT #1:M$ :: PRINT #2
:M$
170 IF EOF(1)THEN 180 ELSE 1
60
180 CLOSE #1 :: CLOSE #2
190 DISPLAY AT(17,1):"ANOTHE
R LISTING? Y/N Y" :: ACCEPT
AT(17,22)SIZE(-1)VALIDAT
E("YN")BEEP:YN$ :: IF YN$="Y
" THEN 130 ELSE STOP
```

For a long time I have wanted to print program listings in TITBITS in 28 column form so that they look like the listing on the screen does when you type it in. I think that would make checking and de-bugging of programs much easier.

Listings in this issue will be of that form. My little conversion program has one bug left at present. If the line of BASIC listing is longer than 80 chars, it doesn't suppress the carriage return and the rest of the program line is written on the next listing line.

There may be a simple way around this problem but I can't see it at present.

If it was possible to produce an ASSEMBLY LANGUAGE program that allowed the LISTING to be read back into BASIC one could use the EDITOR ASSEMBLER MODULE to EDIT BASIC LISTINGS, since the E.A. can load the LISTING files. It would certainly be a handy feature to be able to use the powerful editing facilities of the E.A. on long and involved BASIC programs.

ED.ASS.

TI-BASIC PRINT AND ACCEPT AT?

In the days before EXTENDED BASIC became available, I spent a lot of time trying to develop some FAST TI-BASIC routines that would eliminate the scrolling of the PRINT statement which I found irritating to use.

Recently I had need to revise these routines for some programs I was working on using the TE 2 module's "TEXT-TO-SPEECH" capability.

Further to the above, It is also possible to LIST programs to "MINIMEM" and to "EXPMEM2". A simple program to read DISPLAY-VAR BO files will read them back to the screen. There is something odd about the first record read back. This may be due to the first LISTING record being a null string. See the last SPECIFICATION on page 14 of the MINIMEM manual.

One other feature of the MINIMEM I have only just woken up to is that you can use it to store 4K of data, say 140 lines of 28 chars text file. Then, using EASY-BUG you can save it as a MEMORY IMAGE file to cassette in ONE MINUTE!!!

That could be a great idea for NEWSLETTER articles. It would be a lot faster than our existing TEXTWRITER cassette files.

ED.ASS.

Early "MACHINE-GUN PRINTING" used the SEG\$ method shown by TI in the Character Definition program on page III-26 & III-27 in the "USER'S REFERENCE GUIDE". (See also TITBITS Vol.1 No2 page 19.) This method worked fine but was very SLOW. We soon realised that converting the TEXT to ASCII codes produced a much faster result. It meant more work writing the program but the PRINTING was twice as fast.

A further improvement could be made by reading the next message from data statements whilst the first message was being read on screen by the user of the program.

New members, or those who don't have EXTENDED BASIC might like to try out the following two programs.

The first program is purely a demonstration to show up the relative speeds of the two methods.

The "FAST" message is stored as ASCII codes in the DATA statement of line 140, which is read into the X(32) array. R and C set the row and column at which the printing is to commence. No provision has been made for printing beyond one screen line.

The second program attempts to do a little more. It accepts text at a given location using CALL KEY and then stores it in an ARRAY M(768) for later printout using the fast ASCII method.

There are many limitations in this method. No provision for editing text in case of error, accept at speed is very slow and can miss text and it uses a lot of memory.

Conditionals could be used to reduce the size of the program however they appear to be slower and in this instance SPEED is the main requirement.

If there are faster methods available I would certainly like to see them.

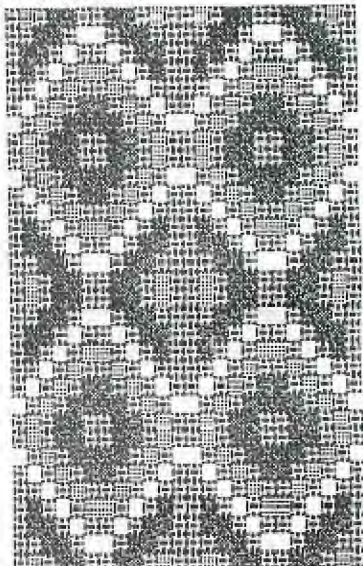
ED.ASS.

100 REM FASTER TI-BASIC PRINTAT DEMO.

```
110 REM
120 CALL CLEAR
130 DIM X(32)
140 DATA 70,65,83,84,32,84,7
3,45,66,65,83,73,67,32,80,82
,73,78,84,33
150 FOR I=1 TO 20
160 READ X(I)
170 NEXT I
180 M$="SLOW TI-BASIC PRINT!"
"
190 C=7
200 FOR R=7 TO 10
210 GOSUB 300
220 NEXT R
230 FOR R=15 TO 18
240 GOSUB 340
250 NEXT R
260 FOR DELAY=1 TO 600
270 NEXT DELAY
280 CALL CLEAR
290 GOTO 200
300 FOR I=1 TO LEN(M$)
310 CALL HCHAR(R,C+I-1,ASC(S
EG$(M$,I,1)))
320 NEXT I
330 RETURN
340 FOR I=1 TO 20
350 CALL HCHAR(R,I+6,X(I))
360 NEXT I
370 RETURN
```

100 REM FAST TI-BASIC ACCEPTAT AND PRINTAT

```
110 REM
120 DIM M(768)
130 CALL CHAR(143,"FEB282828
28282FE")
140 CALL COLOR(14,16,1)
150 CALL CLEAR
160 I=1
170 REM ACCEPTAT R(OW) C(OL)
180 R=1
190 C=1
200 CALL SOUND(60,1320,0)
210 CALL HCHAR(R,C,143,1)
220 CALL KEY(O,K,S)
230 IF S<=0 THEN 220
240 IF K=13 THEN 310
250 IF I>768 THEN 310
260 M(I)=K
270 I=I+1
280 CALL HCHAR(R,C,K,1)
290 GOSUB 450
300 GOTO 210
310 M(O)=I-1
320 CALL CLEAR
330 REM
340 REM PRINTAT R(OW) C(OL)
350 R=1
360 C=1
370 FOR I=1 TO M(O)
380 CALL HCHAR(R,C,M(I),1)
390 GOSUB 450
400 NEXT I
410 CALL KEY(O,K,S)
420 IF K<>32 THEN 410 ELSE 1
50
430 REM
440 REM WRAP SUBROUTINE
450 C=C+1
460 IF C<33 THEN 490
470 C=1
480 R=R+1
490 IF R<25 THEN 510
500 R=1
510 RETURN
```



UNTANGLED



LINES



By GEOFF NUNN.

FROM THE FIRST MOMENT THAT I SAW ALL THOSE LINES RACING ACROSS THE SCREEN, I WANTED TO FIND OUT HOW THE THING WORKED. AT FIRST, I THOUGHT IT WOULD BE IMPOSSIBLE - I HAD NO SOURCE LISTING AND NO KNOWLEDGE OF 9900 ASSEMBLER. THEN I DISCOVERED ONE OF THE BENEFITS OF BELONGING TO A USERS GROUP...OTHER PEOPLE DO HALF THE WORK FOR YOU! KEN HOPKINS WROTE AN EXCELLENT DISASSEMBLER AND BERNIE ELSNER'S PRINTER RAN HOT PRODUCING WHAT SEEMED TO BE AT LEAST A METRE OF PRINTED-OUT LISTING. SO, AFTER MUCH PORING OVER THE ED-ASSEMBLER MANUAL AND BURNING OF MID-NIGHT OIL, THE FOLLOWING WAS MADE POSSIBLE.

.....
THERE ARE NO LABELS IN THE ORIGINAL PROGRAMME - IN FACT IT STARTS IN THE MIDDLE OF WHERE THE SYMBOL TABLE WOULD NORMALLY BE. TO MAKE THE LISTING CLEARER, I HAVE PUT IN LABELS OF MY OWN AND ALSO GIVEN THE SUBROUTINES NAMES.

AS MOST OF OUR MEMBERS DO NOT HAVE ACCESS TO AN EDITOR ASSEMBLER MANUAL, HERE IS A LIST OF THE TI SUB-ROUTINES WHICH ARE USED.

VWTR
THE VALUE IN THE LEAST SIG. BYTE OF R0 IS WRITTEN TO THE VDP REGISTER CONTAINED IN THE MOST SIG. BYTE OF R0.
eg. IF R0=>0011, THEN >11 IS WRITTEN TO VDP REGISTER 0.

VSBW
THE VALUE IN THE MOST SIG. BYTE OF R1 IS WRITTEN TO THE VDP RAM ADDRESS CONTAINED IN R0.

VSBR
READS A BYTE FROM THE VDP RAM ADDRESS IN R0 AND PLACES IT IN THE MOST SIG. BYTE OF R1.

VDPWD
THIS IS THE VDP WRITE DATA REGISTER. IT IS USED IN A WAY NOT DOCUMENTED IN THE MANUAL. THE ADDRESS TO WRITE TO IS PLACED IN IT BY FIRST CALLING VSBW AND WRITING ONE VALUE. THE WRITE ADDRESS IS THEN AUTO-INCREMENTED & THE MOST SIG. BYTE IN R1 IS THEN WRITTEN TO THE NEW ADDRESS.

ABBREVIATIONS USED

S/R	SUB-ROUTINE
MS	MOST SIGNIFICANT
LS	LEAST SIGNIFICANT
ADDR	ADDRESS
VDP	VDP REGISTER
PDT	PATTERN DESCRIPTOR
TABLE	
START X	X CO-ORD AT START OF LINE
END X	X CO-ORD AT COMPLETION OF LINE
XDIF	DIFFERENCE BETWEEN START X & END X

SUBROUTINES START AT LINE >7CD4

THE MAIN PROGRAMME STARTS AT LINE >7D9E

DATA STATEMENTS START AT LINE >7F74

NOTES

1. SECTION >7DAA TO >7DB2 WRITES >D0 TO ADDRESS >1B00 AND I DON'T KNOW WHY. IF THE 3 LINES ARE OMITTED IT SEEMS TO MAKE NO DIFFERENCE. ANY CLUES PLEASE?

2. THE SCREEN IMAGE TABLE HAS TO BE LOADED WITH >00-FF 3 TIMES. R2 IS THE OUTER COUNTER, R1 BOTH THE VALUE TO BE WRITTEN & THE INNER COUNTER.

3. PDT INITIALISED TO ALL ZEROS. R0 CONTAINS THE START ADDRESS, R1 THE VALUE TO BE WRITTEN, R2 IS THE COUNTER. VSBW WRITES TO 1st ADDRESS & PLACES IT IN VDPWD WHICH IS AUTO-INCREMENTAL & NOW LOOPS WRITING TO REMAINDER OF THE TABLE.

4. IN BIT MAP MODE THERE ARE 32 BLOCKS ACROSS & 24 DOWN. EACH BLOCK IS 8 PIXELS WIDE BY 8 DEEP, REQUIRING 8 BYTES DESCRIPTION. THE 1st BYTE DESCRIBES THE 1st 8 PIXELS ON THE TOP ROW, LEFT HAND CORNER. THE NEXT BYTE DESCRIBES THE 8 PIXELS BENEATH THEM & SO ON UNTIL THE 1st 8x8 BLOCK HAS BEEN ENTERED. THE 9th BYTE STARTS ON THE TOP ROW AGAIN, DESCRIBING THE 2nd GROUP OF 8 PIXELS. THE 10th BYTE COVERS THE 8 PIXELS UNDERNEATH THEM & SO ON. THUS THE TOP ROW OF 32 BLOCKS OF 8x8 PIXELS TAKES 256 (>100) BYTES. AS THE 1st BYTE IS 0, THE LAST BYTE IN THE ROW IS >FF & THE 1st BYTE IN THE NEXT ROW DOWN IS >100.

TO CALCULATE THE BYTE OFFSET FOR THE Y CO-ORD, WE MUST ALLOW >100 BYTES FOR EACH COMPLETED ROW OF 32 BLOCKS & THEN ADD 1 FOR EACH ROW LEFT OVER EXCEPT THE 1st.

THE X OFFSET IS A BIT EASIER - EACH COMPLETE 8 PIXELS ACROSS USES 8 BYTES & THE REMAINDER IS THE BIT WHICH HAS TO BE TURNED ON. SO, TO THE VALUE OBTAINED FROM THE Y CALCULATION, WE MUST ADD THE X CO-ORD THEN DEDUCT THE VALUE REMAINING SINCE X LAST PASSED AN 8 BOUNDARY LESS 1. THAT ALL LOOKS CONFUSING. SO LET'S TAKE AN EXAMPLE.

X=10 AND Y=9

SINCE THE FIRST ROW IS NO 0, THE 1st 32 BLOCKS ARE COMPLETED AT ROW 7, WITH 2 OVER. SO THE Y OFFSET IS 256+2-1=257 (>101). NOW ADD THE X CO-ORD & WE HAVE 267. IT CROSSED AN 8 BOUNDARY AT 7 WITH 3 OVER FROM WHICH WE DEDUCT 1 LEAVING 2. DEDUCT THIS FROM 267 & WE HAVE THE BYTE OFFSET OF 265 (>109) & THE BIT TO TURN ON IN THAT BYTE IS BIT 2.

5. S/R CALCULATE IS CALLED BY A BLWP INSTRUCTION WHICH HAS THE FOLLOWING EFFECT:

a. THE W/S POINTER IS LOADED WITH THE VALUE IN THE OPER- AND (>B300), MEANING THAT A NEW SET OF W/S REGISTERS IS NOW IN USE. THE VALUES IN THE OLD W/S REGISTERS ARE SAVED READY FOR USE WHEN WE RETURN FROM THE S/R.

b. THE NEXT VALUE (>7D40) IS PLACED IN THE PC.

c. THE OLD W/S POINTER IS PLACED IN R13(NEW).

d. THE OLD PC IS PLACED IN R14(NEW).

e. THE OLD STATUS REG. IS PLACED IN R15(NEW).

IT IS THUS POSSIBLE TO PASS INFO FROM THE OLD TO THE NEW REGISTERS AS HAPPENS IN LINE >7D4A WHERE THE INSTRUCTION IS TO COPY THE CONTENTS OF ADDRESS >10 OFFSET BY THE CONTENTS OF R13 - THE 16th & 17th BYTES FROM THE START OF THE OLD W/S. THIS IS THE OLD R8 AND ITS CONTENTS ARE COPIED INTO NEW R7.

R12 IS USED AS A FLAG TO INDICATE WHETHER X OR Y IS TO BE INC/DECREMENTED. IT IS SET TO 0 IN LINE >7D40. THE NEXT 2 LINES SET R5-6 TO 1. THEY ARE USED TO INC/DEC THE PLOT POINTS. LINE >7D52 FINDS XDIF - IF THE LINE IS TO BE DRAWN FROM RIGHT TO LEFT, IT WILL BE NEGATIVE & R5 IS NEGATED. R7 NOW CONTAINS XDIF & IF IT IS 0, R12 IS SET TO -1.

YDIF GETS SIMILAR TREATMENT & THEN X & Y ARE COPIED INTO R0 & R1, & THE COLOR BYTE IS COPIED FROM OLD R5 TO NEW R2. CONTROL THEN PASSES TO S/R PIXEL.

6. CHECK S/R. THE 1st FOUR LINES CHECK WHETHER X & Y ARE NOW EQUAL TO END X & END Y. IF THEY ARE, CONTROL RETURNS TO THE MAIN PROGRAMME (AT KEYS CAN). AS THE INSTRUCTION IS RTWP, THE "OLD" W/S REGISTERS COME BACK INTO USE.

IF THE LINE IS NOT FINISHED, THEN EITHER X OR Y IS INC/DECREMENTED. IF R12 IS POSITIVE, THEN X IS CHANGED; IF IT IS NEGATIVE Y IS.

THE REASON FOR THIS IS THAT THE TWO CO-ORDS WILL USUALLY CHANGE AT DIFFERENT RATES DEPENDING UPON THE ANGLE AT WHICH THE LINE IS DRAWN. FOR INSTANCE, A LINE DRAWN FROM 0,10 TO 10,30 FALLS VERTICALLY TWICE AS FAR AS ITS HORIZONTAL MOVEMENT, SO THAT Y WILL NEED INCREMENTING TWICE AS OFTEN AS X. THE PROGRAMME ACHIEVES THIS AS FOLLOWS:

R8 CONTAINS YDIF & R7 XDIF. WHEN X IS CHANGED, R8 IS SUBTRACTED FROM R12. IF Y IS CHANGED, THEN R7 IS ADDED TO R12. IN THE ABOVE EXAMPLE, YDIF IS TWICE AS GREAT AS XDIF AND SO R12 WILL BE NEGATIVE TWICE AS OFTEN AS IT IS POSITIVE WITH THE RESULT THAT Y WILL BE CHANGED TWICE FOR EACH TIME THAT X IS.

THIS IS MADE MORE CLEAR BY THE FOLLOWING TABLE:



SOURCE LISTING IS ON PAGE 8



LISTING	REMARKS	LISTING	REMARKS
SUB-ROUTINES			

INITIALISE (VDP REGISTERS)	INITIALISE	>7D66 MOV @>0E(13),R10	>7D66 COPY START Y INTO R10
>7CD6 LP1 MOV *R2+,R0	>7CD6 COPY CONTENTS OF ADDR IN R2 INTO R0 & INC R2 BY 2	>7D6A S R10,RB	>7D6A START GREATER THAN END?
>7CD8 JLT >7CE0	>7CD8 IF NEGATIVE, JUMP TO END OF SUB-ROUTINE	>7D6C JLT C04	>7D6C YES-JUMP TO C04
>7CDA BLWP @VWTR	>7CDA WRITE 1 BYTE TO VDP REG.	>7D6E JMP C05	>7D6E NO - C05
>7CDE JMP LP1	>7CDE JUMP BACK TO LP1	>7D70 C04 NEG R6	>7D70 NEGATE Y INC/DEC COUNTER
>7CE0 B *R11	>7CE0 FINISHED. BACK TO CALLING PROGRAMME	>7D72 NEG R8	>7D72 ABS VAL (END-START)
		>7D74 C05 MOV R9,R0	>7D74 COPY X INTO R0
		>7D76 MOV R10,R1	>7D76 . . . Y . . . R1
		>7D78 MOV @>0A(13),R2	>7D78 COPY COLOR REG FROM R5 MAIN PROG TO R2
		>7D7C BL @PIXEL	>7D7C BRANCH TO PIXEL
		CHECK	CHECK
WRITE (TO VDP RAM)	WRITE (NOTE 3)	>7D80 C R9,@>10(13)	>7D80 IS X=END X
>7CE2 BLWP @VSBW	>7CE2 WRITE 1 BYTE TO VDP RAM	>7D84 JNE CH1	>7D84 NO-JUMP TO CH1
>7CE6 JMP >7CEC	>7CE6 JUMP TO >7CEC	>7D86 C R10,@>12(13)	>7D86 IS Y=END Y
>7CEB LP2 MOV B R1,@VDFWD	>7CEB WRITE BYTE IN R1 TO ADDR IN VDFWD	>7D88 JNE CH1	>7D88 NO-JUMP TO CH1
>7CEC DEC R2	>7CEC DECREMENT COUNTER	>7D8C RTWP	>7D8C LINE DONE-GO TO KEYSKAN
>7CEE JNE LP2	>7CEE ZERO? NO-BACK TO LP2	>7D8E CH1 MOV R12,R12	>7D8E IS X/Y FLAG NEGATIVE?
>7CF0 B *R11	>7CF0 YES-BACK TO CALLING PROG	>7D90 JLT CH2	>7D90 YES-JUMP TO CH2
		>7D92 A R5,R9	>7D92 NO-INC/DEC X
		>7D94 S RB,R12	>7D94 SUBT YDIF FROM X/Y FLAG
		>7D96 JMP C05	>7D96 CALCULATE NEXT PIXEL
		>7D98 CH2 A R6,R10	>7D98 INC/DEC Y
		>7D9A A R7,R12	>7D9A ADD XDIF TO X/Y FLAG
		>7D9C JMP C05	>7D9C CALCULATE NEXT PIXEL

		MAIN PROGRAMME	

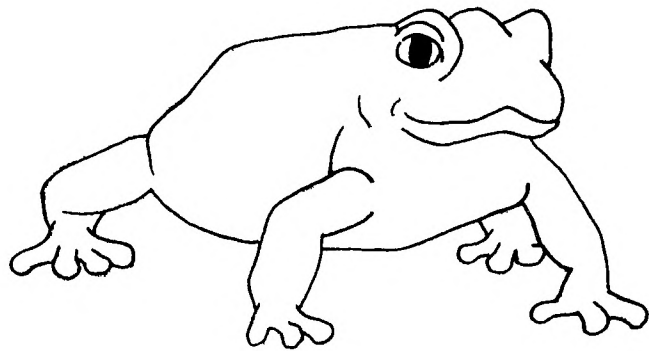
		>7D9E LWPI >B320	>7D9E INITIALISE WORKSPACE
		>7DA2 LI R2,>7F74	>7DA2 LOAD 1st DATA STATEMENT
		>7DA6 BL @INITIALISE	>7DA6 BRANCH TO S/R INITIALISE
			SEE NOTE 1
		>7DAA LI R0,>1E00	>7DAA PLACE ADDRESS IN R2
		>7DAE LI R1,>D000	>7DAE VALUE TO WRITE
		>7DB2 BLWP @VSBW	>7DB2 WRITE 1 BYTE TO VDP RAM
			INIT SCREEN IMAGE TABLE
		>7DB6 LI R0,>1800	>7DB6 1st ADDRESS IN R0
		>7DBA CLR R2	>7DBA SET OUTER COUNTER TO 0
		>7DBC LP4 CLR R1	>7DBC 1st VALUE TO WRITE
		>7DBE LP5 SWPB R1	>7DBE MOVE IT TO MS BYTE
		>7DC0 BLWP @VSBW	>7DC0 WRITE IT TO ADDR IN R0
		>7DC4 SWPB R1	>7DC4 SWAP BYTES BACK
		>7DC6 INC R1	>7DC6 INCREMENT VALUE TO WRITE
		>7DC8 INC R0	>7DC8 NEXT ADDRESS
		>7DCA CI R1,>0100	>7DCA PAST >FF(256)?
		>7DCE JLT LP5	>7DCE NO-DO IT AGAIN
		>7DD0 INC R2	>7DD0 YES-INC OUTER COUNTER
		>7DD2 CI R2,>0003	>7DD2 THREE TIMES AROUND?
		>7DD6 JLT LP4	>7DD6 NO-START AGAIN (N2)
			INIT PATTERN DESC TABLE
		>7DDB CLR R0	>7DDB STARTING ADDRESS=>0000
		>7DDA CLR R1	>7DDA VALUE TO WRITE=>0000
		>7DDC LI R2,>1800	>7DDC INITIALISE COUNTER
		>7DE0 BL @WRITE	>7DE0 BRANCH TO S/R WRITE
			INIT COLOR TABLE
		>7DE4 LI R0,>2000	>7DE4 STARTING ADDRESS=>2000
		>7DEB LI R1,>0000	>7DEB VALUE TO WRITE
		>7DEC LI R2,>1800	>7DEC INITIALISE COUNTER
		>7DF0 BL @WRITE	>7DF0 BRANCH TO S/R WRITE
		>7DF4 LI R0,>0711	>7DF4 WRITE >11 TO VDP R7-BLAC
		>7DF8 BLWP @VWTR	>7DF8 FOREGROUND & BACKGROUND
			INITIALISE PARAMETERS
		>7DFC CLR @>7FB0	>7DFC CLEAR COLOR FLAG
		>7E00 CLR R3	>7E00 CLEAR LINE COUNTER
		>7E02 LI R6,>00B0	>7E02 VALUE FOR START X CO-OR
		>7E06 LI R7,>0060	>7E06 Y . .
		>7E0A LI RB,>00D3	>7E0A END X . .
		>7E0E LI R9,>00A3	>7E0E Y . .
			SET-UP INC/DEC POINTERS
		>7E12 CLR R0	>7E12 CLEAR R0
		>7E14 INCT R0	>7E14 INCREMENT
		>7E16 MOV R0,@>7FA4	>7E16 START X INC/DEC=1
		>7E1A INCT R0	>7E1A INC R0
		>7E1C MOV R0,@>7FAB	>7E1C START Y INC/DEC=2
		>7E20 INCT R0	>7E20 INC R0
		>7E22 MOV R0,@>7FA6	>7E22 END X INC/DEC=3
		>7E26 INCT R0	>7E26 INC R0
		>7E28 MOV R0,@>7FAA	>7E28 END Y INC/DEC=4
			END OF INITIALISATION



CONTINUED FROM PAGE 65		REMARKS	LISTING	REMARKS
LISTING				
7E2C	MLP MOV @>7F80,R0	START OF MAIN PROGRAMME LOOP	>7F00 BL @RANDOM	>7F00->7F12 PLACE NEW VALUE
7E30	JNE MA1	>7E2C COPY COLOR FLAG INTO R0	>7F04 MOV R1,R1	FOR END X INC/DEC IN
7E32	BL @RANDOM	>7E30 IF NOT 0 MISS CLR CHANGE	>7F06 JLT PL3	>7FA6
7E36	ANDI R1,>000F	>7E32 OBTAIN RANDOM NUMBER	>7F08 ANDI R1,>0007	
7E3A	MOV R1,R5	>7E36 KEEP LS NIBBLE	>7F0C JMP PL4	
7E3C	CI R5,>0002	>7E3A COPY INTO COLOR REGISTER	>7F0E PL3 ORI R1,>FFF8	
7E40	JHE @MA1	>7E3C ENSURE NOT LESS THAN 2	>7F12 PL4 MOV R1,@>7EA6	
7E42	ORI R5,>0002	>7E40 OK - JUMP TO MA1		
		>7E42 LOWER-OR WITH 2(SO IT IS NOW EITHER 2 OR 3)	>7F16 BL @RANDOM	>7F16->7F28 PLACE NEW VALUE
7E46	MA1 A @>7FA4,R6	>7E46 INC/DEC START X CO-ORD	>7F1A MOV R1,R1	FOR START Y INC/DEC IN
7E4A	A @>7FAB,R7	>7E4A Y	>7F1C JLT PL5	>7FAB
7E4E	A @>7FA6,R8	>7E4E END X	>7F1E ANDI R1,>0007	
7E52	A @>7FAA,R9	>7E52 Y	>7F22 JMP PL6	
		PLOT POINTS ON SCREEN?	>7F24 PL5 ORI R1,>FFF8	
7E56	MOV R6,R6	>7E56 COMPARE START X TO ZERO	>7F28 PL6 MOV R1,@>7FAB	
7E58	JLT MA2	>7E58 IF NEGATIVE, JUMP TO MA2		
7E5A	CI R6,>0100	>7E5A GREATER THAN >FF?	>7F2C BL @RANDOM	>7F2C->7F3E PLACE NEW VALUE
7E5E	JLT MA3	>7E5E NO-JUMP TO MA3	>7F30 MOV R1,R1	FOR END Y INC/DEC IN
7E60	MA2 NEG @>7FA4	>7E60 YES-NEGATE INC/DEC VALUE	>7F32 JLT PL7	>7FAA
7E64	A @>7FA4,R6	>7E64 AND BRING BACK ON SCREEN	>7F34 ANDI R1,>0007	
7E68	MA3 MOV R8,R8	>7E68->7E76	>7F38 JMP PL8	
7E6A	JLT MA4	CHECKS END X CO-ORD	>7F3A PL7 ORI R1,>FFF8	
7E6C	CI R8,>0100		>7F3E PL8 MOV R1,@>7FAA	
7E70	JLT MA5			
7E72	MA4 NEG @>7FA6		CLEAR SCREEN	CLEAR PATTERN DESCRIPTOR AND COLOR TABLES
7E76	A @>7FA6,RB		>7F42 CLR R0	>7F42 ADDR OF PATT DESC TABLE
7E7A	MA5 MOV R7,R7	>7E7A->7EB8	>7F44 CLR R1	>7F44 VALUE TO WRITE=0
7E7C	JLT MA6	CHECKS START Y CO-ORD	>7F46 CLR R3	>7F46 CLEAR LINE COUNTER
7E7E	CI R7,>00C0		>7F48 LI R2,>1800	>7F48 INITIALISE COUNTER
7E82	JLT MA7		>7F4C BL @WRITE	>7F4C BRANCH TO S/R WRITE
7E84	MA6 NEG @>7FAB		>7F50 LI R0,>2000	>7F50 ADDR OF COLOR TABLE
7EB8	A @>7FAB,R7		>7F54 LI R1,>0000	>7F54 VALUE TO WRITE=0
7EBC	MA7 MOV R9,R9	>7EBC->7E9A	>7F58 LI R2,>1800	>7F58 INITIALISE COUNTER
7EBE	JLT MA8	CHECKS END Y CO-ORD	>7F5C BL @WRITE	>7F5C BRANCH TO S/R WRITE
7E90	CI R9,>00C0		>7F60 B @MLP	>7F60 BACK TO MAIN LOOP AND START NEW SEQUENCE
7E94	JLT MA9		QUIT	QUIT ROUTINE
7E96	MA8 NEG @>7FAA		>7F64 LI R2,>7FB4	>7F64 LOAD FIRST DATA ADDRESS
7E9A	A @>7FAA,R9		>7F68 BL @INITIALISE	>7F68 BRANCH TO S/R INITIALIS
7E9E	MA9 BLWP @>COORDINATE	>7E9E BRANCH WITH NEW WORK-SPACE TO S/R COORDINATE	>7F6C LIM I @0002	>7F6C ENABLE INTERRUPTS
			>7F70 BLWP @>0000	>7F70 BRANCH TO OPENING SCREE
EYSCAN		KEYSCAN	DATA STATEMENTS	
7EA2	KE1 CLR R0	>7EA2 CLEAR R0		
7EA4	MOV B R0,@>8374	>7EA4 SCAN COMPLETE KEYBOARD		INIT BIT MAP MODE. VALUE IN
7EAB	BLWP @KSCAN	>7EAB BRANCH TO KSCAN		LS BYTE IS WRITTEN TO VDPR
7EAC	MOV B @>8375,R0	>7EAC ASCII CODE KEY PRESSED INTO R0 (NO KEY=>FF)		IN MS BYTE.
7EB0	MOV B @>837C,R1	>7EB0 STATUS INTO R1 (NO KEY=0)	>7F74 DATA >0002	>7F74 R0 SET TO BIT MAP MODE
7EB4	JEQ KE2	>7EB4 IF NO KEY, JUMP TO KE3	>7F76 DATA >01E0	>7F76 R1 UNCHANGED
7EB6	CI R0,>0500	>7EB6 IS KEY PRESSED "QUIT"?	>7F78 DATA >0206	>7F78 R2 SCREEN IMAGE STARTS AT >1800
7EBA	JNE KE2	>7EBA NO-JUMP TO KE2		
7EBC	B @QUIT	>7EBC YES-JUMP TO QUIT ROUTINE	>7F7A DATA >03FF	>7F7A R3 COLOR TABLE STARTS AT >2000
7EC0	KE2 CI R0,>4300	>7EC0 WAS "C" KEY PRESSED?		
7EC4	JNE KE1	>7EC4 NO, START AGAIN	>7F7C DATA >0403	>7F7C R4 PDT STARTS AT ADDRESS >0000
7EC6	INV @>7FB0	>7EC6 YES, REVERSE COLOR FLAG		
7ECA	KE3 CI R0,>FF00	>7ECA WAS NO KEY PRESSED?	>7F7E DATA >0536	>7F7E R5 UNCHANGED
7ECE	JNE KE1	>7ECE THERE WAS-START AGAIN	>7F80 DATA >0717	>7F80 R7 LEAVES AT USUAL VALUE FOR GRAPHICS MODE
7ED0	INC R3	>7ED0 NO-INC LINE COUNTER		
7ED2	CI R3,>0050	>7ED2 >50 (B0) LINES DRAWN YET?	>7F82 DATA >FFFF	>7F82 FLAG FOR END OF DATA
7ED6	JNE MLP	>7ED6 NO-DRAW NEXT LINE	>7F84 DATA >0000	>7F84 NOT USED
7ED8	CLR R0	>7ED8 YES, CLEAR LINE COUNTER		
			>7F86 DATA >01F0	>7F86->7F90 RESET REGISTERS WHEN "QUIT" IS PRESSED
			>7F88 DATA >0200	
			>7F8A DATA >03FF	
			>7F8C DATA >0401	
			>7F8E DATA >0560	
			>7F90 DATA >FFFF	
			>7F92 DATA >0000	>7F92->7FA2 UNUSED.
			>7...	STORAGE FOR VARIABLE FLAGS INC/DEC VALUES BETWEEN LINES
			>7FA4 DATA >0002	>7FA4 START X
			>7FA6 DATA >FFFA	>7FA6 END X
			>7FAB DATA >FFFC	>7FAB START Y
			>7FAA DATA >000B	>7FAA END Y
			>7FAC DATA >0000	>7FAC UNUSED
			>7FAE DATA >547C	>7FAE VALUE LAST RANDOM NUMBER
			>7FB0 DATA >0000	>7FB0 COLOR FLAG. >FFFF (-1)= SINGLE COLOR;0=RANDOM COLOR
				END OF LISTING.



toad



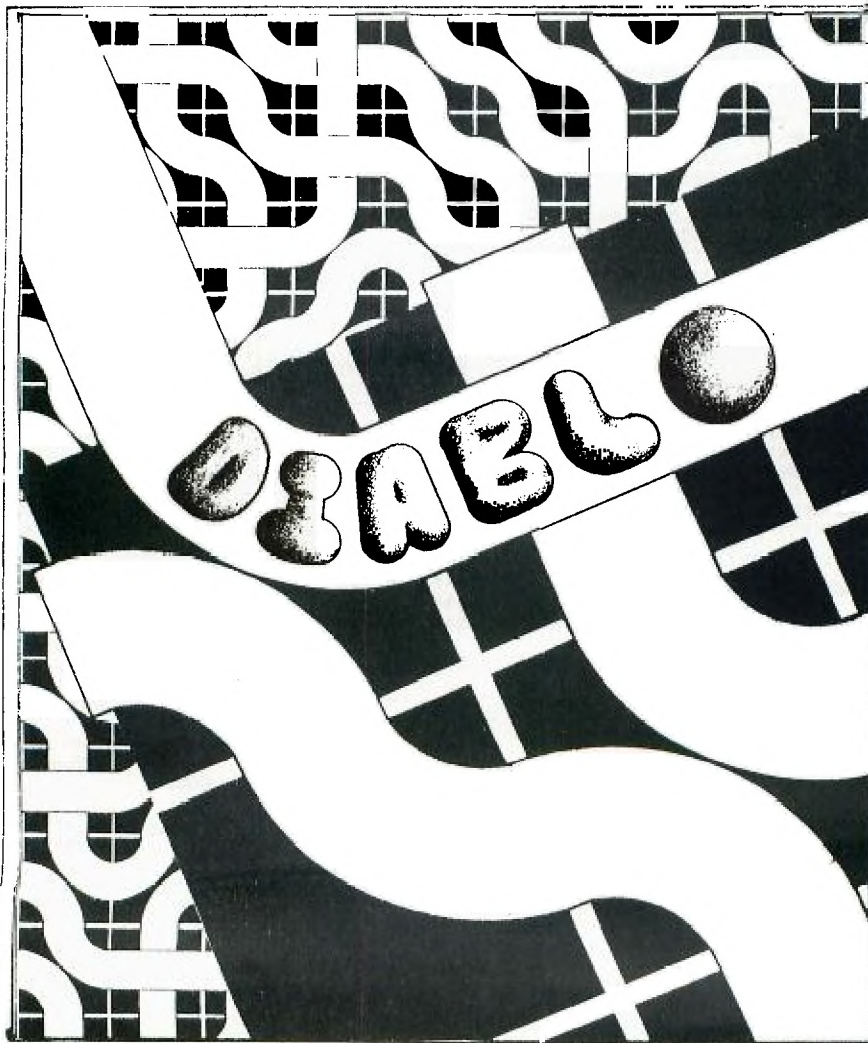
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New HARDWARE

"We are very excited about this new technology", said James O'Connell, Vice President of R&D for Milton Bradley. "For the first time in our company's 123 year history we can truly offer the ultimate interactive game", he went on to tell Charles La Fara, I.U.G.'s President at the winter Consumer Electronic Show. Additionally several of the new software packages in this non-exclusive arrangement, will offer some educational value.

"We are very excited about this New Technology"

From what we have seen so far, this new M.B. chip technology will open a whole new world for the personal computer industry. Imagine, if you can, telling a screen character such as an outfielder to catch a fly ball and then throw it to the second baseman to complete a video double-play, without ever touching the keyboard or a joystick. It's almost frightening isn't it? Some of the new M.B. software will work only with the "expander unit" and some will work utilizing only the 99/4A.



New Milton Bradley triple-axis joystick

Additionally M.B. showed a new triple-axis joystick for the TI Family of computers which should become available later this year. The version we were able to play with at the C.E.S. had a great feel and performed better than any other remote control device we have seen to date. M.B. officials have assured us at the I.U.G. that we will be able to test all of their new products in the near future and we will be keeping members informed of the progress of what we feel is the "Consumer Product of the Decade".

LOW COST PERIPHERALS

TI has announced that it will offer 99/4A owners several new low cost peripherals which can be used connected to the 99/4A console via a Hex-bus attachment PHP1300.

The new Hex-bus attachment is about the size of a Speech synthesizer and will allow the use of an RS232 interface, Wafertape tape drive unit and Printer/plotter. (See photo of CC-40).

Additional low cost peripherals are in the planning stages and may include modems, printers, and a wand input device.

The Hex-bus attachment is expected to be available sometime during the second quarter of 1983 at a retail cost of \$59.95. The RS232 will retail for \$100 and the Wafertape drive unit will be introduced at \$140.00.

The new Wafertape tape drive unit will allow, for the first time on a TI Family Computer System, the storage of a program to tape by filename. Instead of the user entering a program using the SAVE CS1 the user will enter a command like SAVE HEXBUS1. PROGRAMNAME. Once the program is saved to the Wafertape it can then be called back using a command like OLD HEXBUS. PROGRAMNAME without having to know the tape counter number as on a standard cassette. This eliminates the need for cataloging tape counter numbers on tapes where multiple programs are stored.



- 1 WAFERTAPE.
- 2 CC40 COMPUTER.
- 3 TI-99/2.
- 4 COLOUR PRINTER/PLOTTER.
- 5 MINI RS232.



Check this game out! I bought it at COMPUTERWAVE !!!



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- 100 CALL CLEAR
- 110 PI=3.14159
- 120 PRINT "THIS PROGRAM PRINTS THE"
- 130 PRINT "CIRCUMFERENCE OF A CIRCLE."
- 140 PRINT
- 150 PRINT "WHAT IS THE DIAMETER,;"
- 160 INPUT DIAM
- 170 CIRCUM=PI*DIAM
- 180 PRINT "THE CIRCUMFERENCE IS";CIRCUM
- 190 GOTO 140

As we told you at the last meeting TI have announced several new computers. Very latest of which is an IBM clone called "THE PEGASUS".
Rather than slowing down, the pace is still heating up. Where will it end?? Read on.

STOP THE PRESSES



Category:TI-99/4
Subject:HOTTEST RUMOUR AROUND
From:TI2056
Posted:14 JAN 10:51 pm
Okay, here goes: TI is supposed to release (actually have in the stores!) an IBM-PC clone on Jan. 31st. Code name is Pegasus, and will have an available hi-res colour board, and voice response. It will not use a TI CPU, instead it will have the chip used in the IBM.

I see in the Wall Street Journal where TI will introduce an IBM PC look alike based on the 8088! It'll be software compatible with the IBM PC. Within the company it's called the Pegasus. It's expected to sell for about 10% less than the IBM and feature high res graphics and VOICE RECOGNITION.

Other info in the article says "At one time, Texas Instruments was widely expected to walk away with the microcomputer market once it decided to enter it, repeating its success in calculators. But the company was far ahead of its customers, and only last year did sales of its computer for the home market begin to soar. Although Texas Instruments was making the home computer, the 99/4A, on four production lines running three shifts, seven days a week, its production was sold out before Christmas, and the company is still selling all it can make.

It seems we're not the only people to get excited over the new TI IBM clone, the Pegasus. TI's stock has risen 21 points, to 155 a share since the Pegasus was announced on Friday. Meanwhile, with rumors that IBM plans to introduce a low-cost personal computer, the shares of Tandy and Commodore have fallen. Wall Street is evidently gambling that TI is in fine shape to handle whatever new competition may come its way.

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13 PROGRAMMING THE TI/TANDY COLOUR PRINTER

```

100 REM DEMO PROG FOR TANDY          COLOR PRINTER PLOTTER
110 REM
120 OPEN #1:"RS232.BA=600"
130 PRINT #1:CHR$(19)
140 PRINT #1:CHR$(18);"S4" :: PRINT #1:"CO"
150 PRINT #1:"LO" :: PRINT #1:"MO,-50"
160 PRINT #1:"TI-99" :: PRINT #1:"S1"
170 PRINT #1:"MO,-20" :: PRINT #1:"S1"
180 PRINT #1:CHR$(17)
190 PRINT #1:CHR$(29);"          COLOR";CHR$(29);"GRAPHIC";CHR$(29);"PRINTER";CHR$(
200 A$=CHR$(10):: PRINT #1:A$;A$
210 PRINT #1:"-----PIE GRAPH-----"
220 PRINT #1:A$
230 PRINT #1:CHR$(18);"MO,-120,120,-120"
240 PRINT #1:"I"
250 GOSUB 690
260 PRINT #1:"M130,0,130,"; (N-1)*15
270 FOR I=1 TO N
280 PRINT #1:"I"
290 PRINT #1:"C";COLOR(I)
300 PRINT #1:"J0,20,30,0,0,-20,-30,"
310 J=0
320 PRINT #1:"MO,";J :: PRINT #1:"J30,0"
330 J=J+PITCH(I):: IF J<20 THEN 320
340 PRINT #1:"M40,0" :: PRINT #1:"P";NA$(I)
350 FOR K=1 TO 11-LEN(NA$(I))
360 PRINT #1:"P" :: NEXT K
370 PRINT #1:"P";U(I);UNIT$
380 PRINT #1:"MO,0,0,-30"
390 NEXT I
400 PRINT #1:"MO,-100" :: PRINT #1:"A"
410 PRINT #1:"-----SIN AND COS CURVES-----"
420 PRINT #1:CHR$(18);"RO,-150,240,0"
430 PRINT #1:"I"
440 PRINT #1:"X1,-20,10"
450 PRINT #1:"HX1,20,10"
460 PRINT #1:"HX0,16,5"
470 PRINT #1:"HX0,-16,5"
480 PRINT #1:"CO" :: PRINT #1:"LO"
490 B=30 :: H=15 :: C=0 :: GOSUB 600
500 PRINT #1:"C1" :: PRINT #1:"L3"
510 B=-100 :: H=80 :: C=0 :: GOSUB 600
520 PRINT #1:"C2" :: PRINT #1:"L5"
530 B=100 :: H=80 :: C=1 :: GOSUB 600
540 PRINT #1:"C3" :: PRINT #1:"LO"
550 B=100 :: H=80 :: C=0 :: GOSUB 600
560 PRINT #1:"MO,-150" :: PRINT #1:"CO"
570 PRINT #1:"A" :: PRINT #1:"-----THE END-----"
580 PRINT #1:
590 END
600 REM **DRAW SIN OR COS CURVE**
610 A$="M"
620 FOR I=-200 TO 200 STEP 4
630 S=I/B*PI
640 IF C=0 THEN Y=INT(SIN(S)*H)
650 IF C=1 THEN Y=INT(COS(S)*H)
660 PRINT #1:A$;I;",";Y :: A$="D"
670 NEXT I
680 RETURN
690 REM
700 READ R,N,M,UNIT$
710 FOR I=1 TO N
720 READ NA$(I),U(I),COLOR(I),PITCH(I)
730 NEXT I
740 P2=2*PI
750 A$="M"
760 FOR I=0 TO 100 STEP 2
770 S=1/100*P2
780 X=INT(SIN(S)*R):: Y=INT(COS(S)*R)
790 PRINT #1:A$;X;",";Y :: A$="D"
800 NEXT I
810 S=0
820 FOR I=1 TO N
830 S=S+U(I)*P2/M
840 X=INT(SIN(S)*R):: Y=INT(COS(S)*R)
850 PRINT #1:"HD";X;",";Y
860 NEXT I
870 F=0
) FOR I=1 TO N
) PRINT #1:"C";COLOR(I)
900 Q=F :: F=F+U(I)
910 QS=Q*P2/M :: PS=F*P2/M
920 QX=INT(SIN(QS)*R):: QY=INT(COS(QS)*R)
930 PX=INT(SIN(PS)*R):: PY=INT(COS(PS)*R)
940 ST=R :: EN=-R
950 IF QY>=0 AND PY>=0 THEN EN=0
960 IF QY<=0 AND PY<=0 THEN ST=0
970 FOR Y=ST TO EN STEP -PITCH(I)
980 J=0
990 RA=SGN(R*X-Y*Y)
1000 IF Y=0 THEN RS=PI/2 :: GOTO 1030
1010 RS=ATN(RA/Y)
1020 IF RS<0 THEN RS=RS+PI
1030 IF QS<RS AND RS<PS THEN D(J)=INT(RA):: J=J+1
1040 RS=P2-RS
1050 IF QY=0 THEN GOTO 1110
1060 X=QY/QY*Y
1070 IF (X)<>SGN(QX) THEN GOTO 1110
1080 IF (Y)<>0 AND SGN(QY)<>SGN(Y) THEN GOTO 1110
1090 RT= (X*X+Y*Y)
1100 IF RT<=R THEN D(J)=INT(X):: J=J+1
1110 IF PY=0 THEN GOTO 1170
1120 X=PY*Y/PY
1130 IF (X)<>SGN(PX) THEN GOTO 1170
1140 IF (Y)<>0 AND SGN(PY)<>SGN(Y) THEN GOTO 1170
1150 RT= (X*X+Y*Y)
1160 IF RT<=R THEN D(J)=INT(X):: J=J+1
1170 IF QS<RS AND RS<PS THEN D(J)=INT(-RA):: J=J+1
1180 IF Y=0 AND J<>2 THEN D(J)=0 :: J=J+1
1190 IF J<=2 THEN 1270
1200 FOR K=0 TO J-1
1210 @MIN=D(K):: MN=L
1220 FOR L=K+1 TO J-1
1230 IF D(L)<@MIN THEN @MIN=D(L):: MN=L
1240 NEXT L
1250 D(MN)=D(K):: D(K)=@MIN

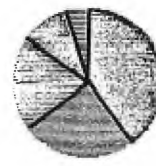
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```

1260 NEXT K
1270 K=0
1280 IF J<2 THEN 1310
1290 PRINT #1:"M";D(K);",";Y :: PRINT
#1:"D";D(K+1);",";Y

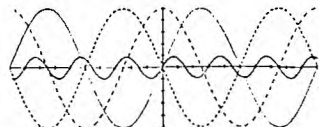
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COLORGRAPHICPRINTER

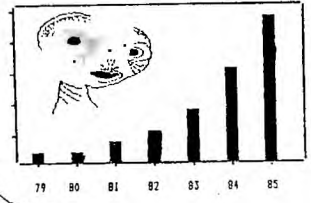
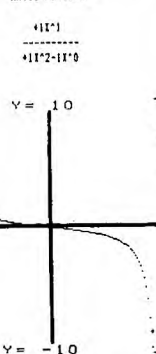
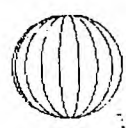


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Game Timer: by Rick Mirus

I was recently writing a game program when my wife decided it would be nice to have a clock displayed on the screen which could accurately limit the time allowed for a player to move. While a player is deciding on a move, the computer has to jump back and forth through various sections in the program to scan the joystick, scan the keyboard, check for valid moves and reposition a pointer on the screen. So how can you keep an accurate account of elapsed time while doing all of that? Well the problem can be solved easily.

As you know, once a sprite is set in motion it continues to move across the screen in a smooth and regular fashion no matter what the rest of the program is doing. This feature, plus the CALL POSITION command supplies you with everything you need for a timer.

You need only one program line to set the clock and sprite in motion. You then place another line for updating the clock in all the various loops and sub-routines during which you want the clock updated.

Here is a short program to demonstrate:

```

100 Y=2 :: X=13
110 DISPLAY AT(22,1)BEEP ERASE ALL:"TYPE A KEY OR MOVE JOYSTICK" :: DISPLAY
    AT(14,13):"TIME"
120 CALL SPRITE(#1,32,1,10,228,0,-1)
130 CALL SPRITE(#2,42,2,90,124,#3,88,16,90,124)
140 CALL JOYST(1,A,B) :: CALL JOYST(2,E,F)
150 CALL KEY(O,K,H)
160 CALL POSITION(#1,C,D) :: TIME=INT(D/3.75) :: DISPLAY AT(15,13):TIME :: IF
    (D>250)+(TIME=0) THEN 220
170 CALL MOTION(#2,-B,A,#3,-F,E)
180 IF H=0 THEN 140
190 X=X+1 :: IF X>20 THEN X=13 :: Y=Y+1 :: IF Y>9 THEN Y=2
200 CALL SOUND(-1000,K*4,0) :: CALL HCHAR(Y,X,K)
210 GOTO 140
220 CALL SOUND(500,2200,0) :: END

```

(FROM CIN-DAY USERGROUP)

Line 120 starts the sprite in motion. Line 160 displays the time on the screen. In your program just put a line similiar to line 170 in as many places as you like, so the time can be updated. If you don't do this often enough, your time may jump more than one at a time, but don't worry, it will still be keeping accurate time.

In line 20 the sprite is located in row 10 and column 228. Color 1(transparent) is used so that the sprite will not be seen. Column 228 at a speed of -1 provides us with 60 seconds before the sprite reaches the edge of the screen. This could be changed to another number. For example,if you cut it almost exactly in half to 116, you would get a 30 second timer. In line 160 the column position of the sprite is divided by 3.75 to change position into seconds.

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