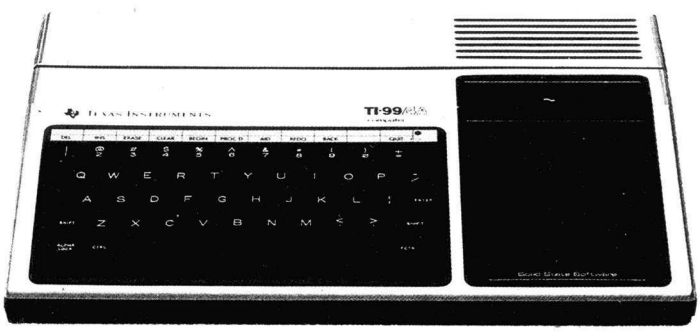
VOLUME 1
ISSUE 4

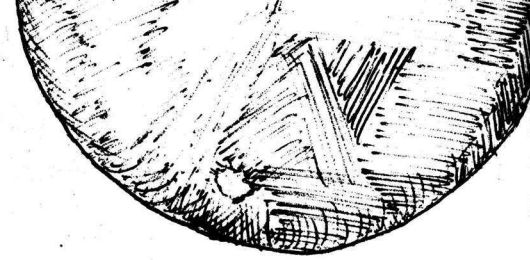
99/4A

INDEPENDENT BI-MONTHLY MAGAZINE FOR THE USERS
OF THE T.I. 99/4A HOME COMPUTER

PARCO Electrics



"STILL HERE"



All was quiet aboard the Starship Crapo Electrica. Frankly Poorish, the commander of the ship, for once sat back and allowed his thoughts to drift. Soon he was dreaming of how it all began.....

Deep in the heart of Devonia, in the year AD 1983, Frankly Poorish sat cooking his accounts. Frankly was no normal mortal. His father piloted aeroplanes and jumped out of them (not necessarily in that order), and helped Frankly to obtain a degree in the art of Double Glazing Selling. To say that he sold it is an understatement of some magnitude. Eskimos queued for miles to buy from him, and still he had the last laugh - the 'Acts of Polar Bear' clause was not worth the slab of sheet-ice it was etched on.

Frankly leaned forward and chewed on his pencil. He swore as it snapped, driving a splinter painfully into his gum. "Eureka!" he shouted to his wife Annually. "You don't smell so good yourself" was the abrupt reply. "No, you simply do not understand do you? I've been chosen!" Annually dropped the dust-cover she was knitting and ran in from the workshop. Ever since Frankly had received the Mark of the 99 the previous month, he sensed in his gut that for him it held a quite profound significance. "One day," he often mused "I'll be called to spread the gospel of 99 to many nations. The time will come when people everywhere will thank me for introducing them to the Order of Parsec!"

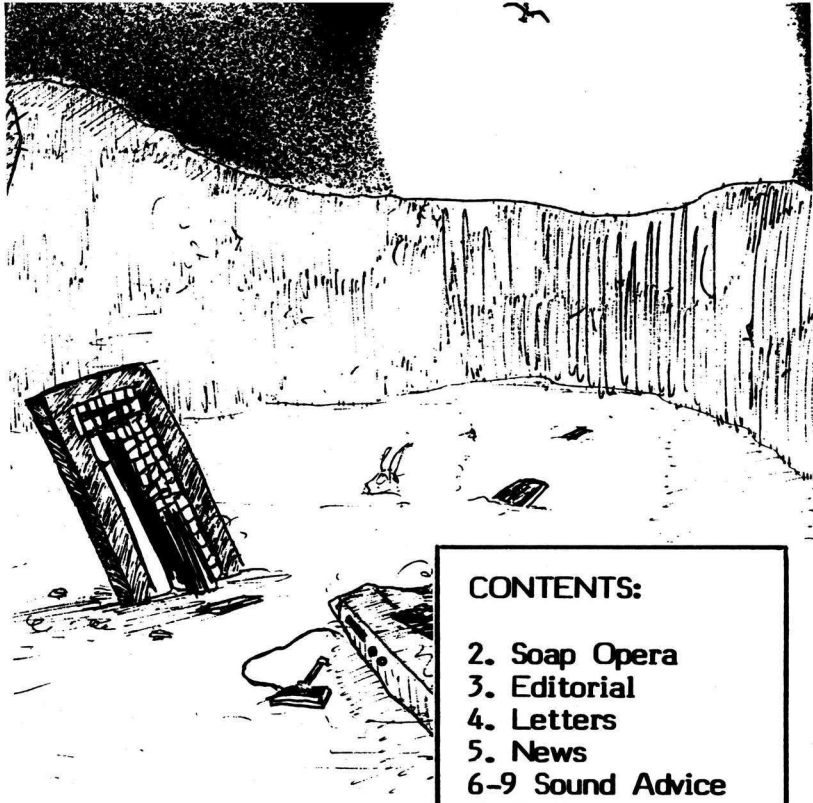
"Your tea's gone cold, love..." whispered Annually, little realizing that she was addressing the man whom destiny had appointed to proclaim the message that mankind had waited to hear. The room hushed as Frankly gave Annually a serious look, motioning with his finger. "On your knees, my dear..." "Yes sir...but why..." "Because I've just dropped a fiver here somewhere." muttered Frankly with a hint of blind panic.

From that day everything cascaded violently into place. Frankly knew that he would have to find a base from which to operate, and that he would need to develop strong contacts in high places. He turned to face Bedford and bowed three times, shouting "By the Powers of Lubbock!" thus invoking the attentions of the Masters of 99. That was it. With the Masters on his side there was no stopping him. A ship was found and had soon been stocked with a small but very precious cargo. The starship Crapo Electrica was ready to sail. Little did Frankly realize what lay ahead. If he only knew the direction, distance, or dangers that lay ahead then he would surely have hesitated. But such was the clarity of his calling, and the faith shown by Annually his wife, Big Ed his father, and Nat Waste his benefactor, that this was clearly an unstoppable mission.

As the plan took shape, Frankly realized that it would be foolish to attempt it alone. Mercifully his good friend Petty Gripe was at hand, and was only too pleased to relinquish his multi-million pound bacon sandwich empire in order to pack modules of hope for desperate devotees of the Mark of 99. "The Hornby Dublo will have to go" warned Frankly, "and even the stamp collection is at risk." "I will do anything for the cause, sir," said Petty, as he stuffed vases, clocks, pictures, ornaments, jewellery, knives, forks, false teeth, children, carpets, underwear, wedding albums, whips, cans of food and such like into black plastic bags ready to be hidden in the loft. He knew that nothing was safe any more, but he shared Frankly's vision and dedication. "Are you sure we are doing the right thing?" he said.

to be continued.....

STILL HERE



Most of us probably thought that the decision of Texas Instruments to cease production of the 99/4a was a clear signal that the Beginning of the End was nigh.

Well now, here we are - a year and a half on - still going strong, and as far as this publication is concerned, on the increase. Perhaps it was just the End of the Beginning!

What is clear is that YOU have fallen hopelessly in love with your computer. Just what it is about the TI that grabs you so completely is hard to say. Obviously it has its good points; dare I say it also has it's weak areas. What IS interesting is that the real pulling power of the 99/4a probably can't be defined in terms of tangible features. Whatever the attraction, one fact is sure - it is strong enough to have persuaded many thousands of users that it still deserves pride of place in the home. Strong enough to have thwarted the attempts of a myriad of other 'current' machines to usurp it's rightful place.

Just in case you need reminding, not only does this wonderful computer regard itself as a relatively permanent fixture, we also are STILL HERE! Even though other comrades have yielded to the misconception that the days are over, we would need a lot of convincing that they are anything more than slightly numbered. The future has more to do with mentalities rather than practicalities, and we should know better than anyone right now.

For the sake of those who tend toward pessimism, we have saved some bad news. The price per issue has had to be increased to £2.25 (due to rising costs), but having said that, we do encourage you to take the popular option of ordering a subscription, which is now at a special rate of £12 per annum.

Well, finally we want to thank all of you for supporting this magazine to date. We hope you enjoy it, and that you will remember to provide plenty of feedback in the days to come.

FUNCTION and QUIT

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LETTERS LETTERS LETTERS LETTERS LETTERS

Dear All at Parco,

I have just received your newest 99/4a magazine. I think it's brilliant, you can guarantee that I will be getting every future issue....

Andrew Close

Dear Parco,

Thankyou for another super issue of 99/4a magazine. Data-Filer excellent and runs smoothly in Extended Basic....

F.Willis, Stalybridge

Dear 99/4a,

Thankyou for the great magazine....
....99/4a could be made even better by having more Hardware and Software reviews,

Master G. Mackenzie, Edinburgh

Dear Sirs,

....Congratulations on producing such an excellent interesting magazine. I welcome all articles explaining program listings and the art of programming.

Mr D.J.Armer, Brewood

Dear Sirs,

The 2nd issue of 99/4a was <u>just</u> the magazine I've been looking for - a marvellous, exciting and <u>totally</u> relevant publication. I happily remit for a full years sub.

Scott Rosser, Beddington

Dear Sirs,

....I look forward to the next editions of the new magazines, and hope that they find a great deal of success around the TI owners of Britain, advice and hints are very useful indeed to the green newcomers like myself and friends.

Michael Flanagan, B'ham

Dear Sir,

....I was pleased with the quality of programs in issue 2 and intend to order it every issue. Have you any back issues No 1 available, if so what is the cost of back issues?....
....Congrats on your 'Sound Advice' column. How about some game writing advice or graphics advice. Keep up the good work.

R.A.Haberfield, Tylorstown

Dear Sir,

....I enjoy your magazine and look forward to future issues, especially the promise of programs to utilize the Minimemory facility. How about offering a 'Software on tape' subscription to save those of us who are not dedicated Keyboard Krunchers hours of tedious migraine inducing typing?

H.R.Smith, Binbrook

Dear Sirs,

I must congratulate you for an excellent magazine well worth its price. The magazine is most helpful for us TI99/4a users....

Dear Sirs

.... I take the opportunity of thanking you also for the second excellent issue of the magazine, though due to other commitments I have had little time to try any of the programs except 'Beagle Hike' which is very good. However I am a little puzzled how so many lines are too long for the 99/4a to accept, necessitating having to leave automatic line numbering. Since you must presumably check all programs, does it depend on the printer being used?

G.D.Denton, Cardigan

NEWS NEWS NEWS NEWS

NEWS NEWS NEWS NEWS

NEWS

G R A P H X

The ULTIMATE Grpahics Software

So you thought Super Sketch was good, eh? Well for anyone with an expanded TI, this package certainly lives up to its extravagant claims.

This is the Graphics Software that has been stunning users in Australia, (from where it originates), America, and now Europe. The result of two years' work, this package has more features than any other of its type, and has been referred to by many as 'the most exciting software ever seen on the TI'.

We will review it thoroughly next time, but for now cast your eye over the main features:-

Drawing and Erasing
Zoom for close-up work
Repainting new colours
Filling shapes
Printer options
Moving/Copying parts of picture
Disk saving
Lines/Circles options
Use of pics in assembly progs
Clipboard facility
Animation
etc etc

To run GRAPHX you will need the 32k Memory Expansion, Disk Drive, and Joystick. RS232 interface and EPSON MX80 compatible printer are required for printing. Three versions of GRAPHX are available - EXTENDED BASIC, EDITOR/ ASSEMBLER or MINIMEMORY.

Beware of imitations, GRAPHX is the package you want.

SPOT THE IDIOTS

O.K., we confess - many of you will have tried to grapple with our competition in the last issue, only to find a flaw. Most entrants to date did work out what was wrong, but we appreciate that it must have been misleading and annoying for all of you.

The error? Well the wordlist was short of one software title: HUSTLE. Now you have the info perhaps you'll forgive us and have another bash - for this reason we will extend the duration of the competition, THE CLOSING DATE IS MAY 31st 1985.

Thankyou for your entries so far, we only hope that our mistake didn't cause you too much HUSTLE.

CHIPS TO BEDFORD

You've heard of 'Coals to Newcastle', well the PARCO ROADSHOW recently hit Bedford, which of course is the UK HQ of Texas Instruments.

As we have come to expect with this sort of affair, the problem never was getting people to come, but coping with the numbers that did!

Once again there was plenty to see, plenty to buy, and plenty to be pleased about. We get the feeling that you want the TI to be around a while, and you may be sure that we are sold on that cause too.

As mentioned before, it is our plan to get around during the year, so let us know if you want us 'down your way' - we can't get everywhere, but we will try to cover the areas where the support warrants a visit.

NEW BULLETIN BOARD

We enclose here an extract from a letter recently received.

- I am starting up a Bulletin Board system here in Plymouth. One of the special interest areas planned is for the TI99/4a Micro. I will be providing a file area for upload and download of software and in addition a news and message area. The facility will be free to users.

The online times will be from 2100hrs to 1700hrs Sunday to Saturday. The board will be offline on Saturdays 1700hrs until Sunday 2100hrs to facilitate file maintenance etc. The board will operate at 300 baud, 8 data bits, No parity, 1 stop bit for normal users. The system runs on FidoNet software -

For further info contact:-

J.D.Richardson
17 Rodney St
St.Budeaux
Plymouth
PL5 1BD

(0752) 364059

ANDY from Southampton requests that in addition to our section "Little Bits" that we run a section for the more mature TI user entitled "Big Bits"....

(- funny, I never thought of Andy as being mature - Ed.)

HELP US AND HELP YOURSELF!!

Perhaps you can help us help you.

Anyone who has been to the Land of Parco will know that we are a small concern doing a big job.

If you have not already ordered an annual subscription to 99/4a, then we are asking you to consider it. In so doing, for £12 you will not only help reduce our administration problems, but with the single-issue price now at £2.25 you can save yourself some loot at the same time. The more Subs we get, the wider a vision we get of ongoing support both for the computer and magazine as well.

Thankyou in advance.

13 - A GREAT NUMBER!

Look out for the June issue of Computer and Video Games. It contains a 'Texas Reviews Special' which comprises no less than THIRTEEN rave reviews of TI software. Each item is marked out of ten on four counts: Graphics, Sound, Value and Playability. Nice to see that there is nothing less than seven to be found here, and one module even gets the Torvill and Dean treatment!

I was informed by a member of C/VG staff that they are considering a change of name to 'Computer and Parco Games', since they cannot remember one supplier ever commanding an entire section of reviews before.

LATE LATE LATECOMERS

Well, they are still arriving at the TI Users Conventions (Yes, Brighton went very well, in answer to all those who have been asking), and here are a couple of the latecomers:-

Mr D.Bug, who has brought his Pal - N. Coder...

Mrs Toothry-tu and her daughter - Iris...

Dot Maytricks with Daisy Weal...

Oh no, it's Colin Startapax...

SOUND ADVICE

Hopefully you will by now have realized that we want your input to this magazine, and it is with great pleasure that we can introduce here the first of what we hope will be many such contributions.

The following article is the work of MALCOLM BIRKETT and consists of a music 'control' program, plus a clear description of what it does. Malcolm has written the program in two forms; primarily in Extended Basic, but also in TI Basic.

Dear Parco,

Enclosed is a program which may be of some interest for the 'Sound Advice' section of your magazine.

It is essentially a 'control' program which allows sensible data statements to be used. Also it allows you to choose both the speed(tempo) and number of verses each time it's run.

What do I mean by 'sensible' data? You may well ask! I'll try to explain. Obviously some knowledge of music would help.

Instead of note pitches being expressed in Hz they are numbers from 1 to 50 at half tone intervals - see below:

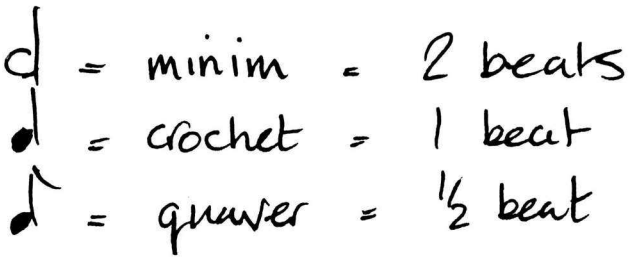
Also a 'rest' is catered for in the program. Unfortunately the TI doesn't allow a frequency of '0' in Call Sound statements (which would seem sensible for a rest), so I set my

F(0) = 20,000 Hz

which you can't hear anyway! Therefore data 0 = rest.

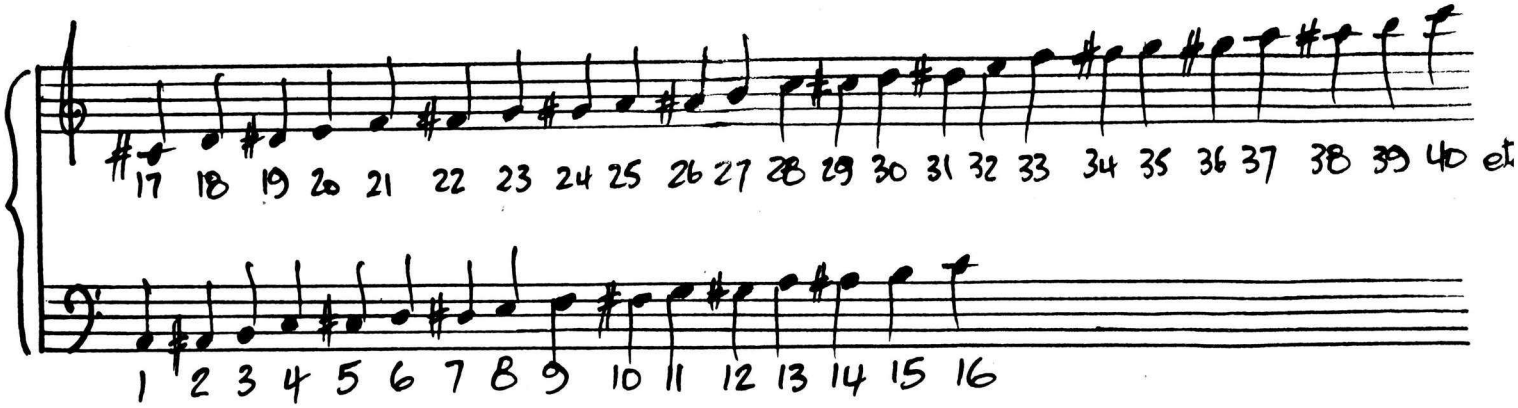
Now to note lengths.

Seconds x 10-3 are not an easily identifiable musical length, therefore I set note lengths to 'beat' values - as follows:-



The actual speed(tempo) that the tune is played can then be adjusted on each run.

I've put 3 tunes on this program as examples, the control program can handle any number (providing you've enough 'memory') each one up to 140 notes long with 3 parts in each tune. Obviously the 'menu' screen etc. would need amending for different tunes. The last tune on the program also shows that single part tunes can be catered for by just entering '0's in the other parts.



MUSIC CONTROL PROGRAM:

extended basic.

```
100 !  ** THIS PROGRAM USES
SINGLE DIM. ARRAYS TO STORE
INFORMATION ON NOTE FREQ. &
LENGTH ETC
110 ! FORMULEA USED FOR 'F'
GIVES 50 NOTE REGISTER FROM
LOW A UP AT HALF TONE INTER-
VALS.THUS LOW A=1 A#=2 B=3
C=4 C#=5 etc
120 ! AT END OF MELODY(SOP)
PART DATA IT IS NECESSARY TO
TYPE '-1' AS THIS STOPS READ
-ING LOOP & SETS TUNELENGTH
130 ! TI DOES NOT ALLOW 'F'
VALUE OF '0' FOR RESTS SO I
SET F(0)=20000Hz - THIS IS
OUTSIDE AUDIBLE RANGE & DOES
THE JOB OK
140 !ALSO SUGGEST YOU ALWAYS
 HAVE REST (DATA='0') AT END
OF EACH PART TO CURTAIL LAST
NOTE
150 !NOTE LENGTHS ARE EXPRES
-SED IN DATA STATEMENTS AS
BEAT VALUES -CROCHET=1 MINIM
=2 QUAVER=0.5 ETC
160 !THEY ARE THEN CONVERTED
TO REQD LENGTHS (SECSx10-3)
BY INPUT OF TEMPO VARIABLE &
SIMPLE MATHS
170 !THIS PROGRAM DOES NOT
SHOW OFF THE VARIOUS SOUNDS
POSSIBLE WITH THE TI BUT IT
ENABLES YOU TO EASILY(?) AND
FAIRLY QUICKLY PROGRAM TUNES
180 !THE PROGRAM CAN HANDLE
TUNES WITH UPTO 140 NOTES IN
EACH OF 3 PARTS ( 420 NOTES
IN ALL)
190 !VOLUMES ARE SET AS FOLL
OWS:- MELODY=0,BASS=3,MID=4.
IF YOU WANT A DIFFERENT BALA
NCE RESET AS REQD.
200 !TYPE IN PROGRAM EXACTLY
AS SHOWN - IT'S A BIT TIGHT
IN 16k
210 !
220 !**********************
230 !*MUSIC CONTROL PROGRAM*
240 !*  FOR TI99+EX BASIC  *
250 !*      DEC.1984       *
260 !**********************
270 !***** M D BIRKETT *****
280 !**********************
290 !
300 DIM F(51)
310 DIM SOP(140)
320 DIM BASS(140)
330 DIM MID(140)
340 DIM LENGTH(140)
350 DIM L(140)
360 A=2^(1/12)
370 FOR I=1 TO 50 :: F(I)=11
0*A^(I-1):: NEXT I :: F(0)=2
0000
380 CALL CLEAR
390 PRINT "***AN EMDEEBEE PR
ODUCTION***" :: PRINT "" ::
PRINT ""
400 PRINT "  YOUR TI.99/4A W
ILL PLAY  " :: PRINT ""
410 PRINT "       A SELECTIO
N OF      "
420 PRINT :: PRINT "     'ME
LODIES FOR YOU'     " :: PRIN
T "" :: PRINT ""
430 PRINT "      ***********
*****      " :: PRINT "" ::
PRINT "" :: PRINT ""
440 PRINT :: PRINT " 1). TEX
AS ROSE * hit1,2or3"
450 PRINT "                 *
          "
460 PRINT " 2). OLD SMOKEY *
 and press" :: PRINT "
          *          "
470 PRINT " 3). THE QUEEN  *
 ENTER key"
480 PRINT "" :: PRINT "" ::
PRINT ""
490 INPUT "  YOUR CHOICE ":C
H
500 ON CH GOSUB 1290,1300,13
10
510 CALL CLEAR :: PRINT "HOW
 MANY VERSES DO YOU WANT" ::
 INPUT V
520 PRINT :: PRINT :: PRINT
530 PRINT "TEMPO REQD.(1 slo
w-10 fast)" :: PRINT "" :: P
RINT "           (i suggest
";T;" )" :: INPUT TEM
540 DISPLAY AT(2,8)BEEP:"**L
OADING DATA**"
550 IF CH=3 THEN TEMPO=650-(
TEM*20)ELSE TEMPO=350-(TEM*2
0)
560 TUNELEN=0
570 FOR NOTE=1 TO 140 :: TUN
ELEN=TUNELEN+1 :: READ SOP(N
OTE)
580 IF SOP(NOTE)<>-1 THEN 59
0 ELSE 600
590 NEXT NOTE
600 TUNELEN=TUNELEN-1
610 FOR NOTE=1 TO TUNELEN ::
 READ BASS(NOTE):: NEXT NOTE
620 FOR NOTE=1 TO TUNELEN ::
 READ MID(NOTE):: NEXT NOTE
630 FOR NOTE=1 TO TUNELEN ::
 READ LENGTH(NOTE):: NEXT NO
TE
640 !650 CONVERTS NOTE LENGT
HS FROM BEAT VALUES TO 1/100
0 ths. OF A SECOND
650 FOR NOTE=1 TO TUNELEN ::
 L(NOTE)=LENGTH(NOTE)*TEMPO
:: NEXT NOTE
660 CALL CLEAR :: DISPLAY AT
(12,7)BEEP:"**HERE IT COMES*
*" :: FOR D=1 TO 200 :: NEXT
 D
670 FOR VERSE=1 TO V
680 FOR TUNE=1 TO TUNELEN ::
 CALL SOUND(L(TUNE),F(SOP(TU
NE)),0,F(BASS(TUNE)),3,F(MID
(TUNE)),4):: NEXT TUNE
690 NEXT VERSE
700 GOTO 300
710 ! *YELLOW ROSE OF TEXAS*
720 ! SOP PART
730 DATA 25,23,22,25,25,25,2
7,25,25,23,22,25,30,30,30,32
,34,34,34
740 DATA 25,25,34,34,34,34,3
2,32,30,29,30,32,32,32,34,32
,32,32
750 DATA 25,23,22,25,25,25,2
7,25,25,23,22,25,30,30,30,32
,34,34,34
760 DATA 25,25,35,35,35,35,3
4,37,35,34,32,30,25,24,25,34
,32,30,0,-1
770 !BASS PART
780 DATA 0,0,6,18,1,18,6,18,
1,17,6,18,1,1,18,18,6,18,18
790 DATA 0,13,18,1,18,13,17,
1,18,13,12,13,13,15,15,13,11
,10
800 DATA 8,8,6,18,1,18,6,18,
1,17,6,1,3,3,5,5,6,1,6
810 DATA 0,1,0,13,0,6,0,11,1
1,0,0,13,13,0,0,0,1,1,6,0
820 !MID PART
830 DATA 0,0,18,22,22,22,23,
22,22,20,18,22,22,22,22,23,2
5,25,25
840 DATA 22,22,25,25,25,25,2
3,23,22,20,22,23,23,23,25,23
,23,23
850 DATA 22,20,18,22,22,22,2
3,22,22,20,18,22,22,22,22,23
,25,25,25
860 DATA 22,22,25,25,29,30,3
0,27,27,27,27,25,22,22,22,25
,23,22,0
870 ! NOTE LENGTHS
880 DATA .5,.5,1,1,1,1,1,1,1
,1,1,1,.5,.5,.5,.5,1,1,1
890 DATA 1,1,1,1,1,1,1,1,1,1
,1,.5,.5,.5,.5,1,1,1
900 DATA .5,.5,1,1,1,1,1,1,1
,1,1,1,.5,.5,.5,.5,1,1,1
910 DATA 1,1,1,1,1,1,1,.5,.5
,.5,.5,.5,.5,.5,.5,1.5,.5,2,
1
920 !*ON TOP OF OLD SMOKEY*
930 ! SOP PART
940 DATA 18,18,22,25,30,30,3
0,27,27,27,27,27,23,23,25,27
,25
950 DATA 25,25,25,25,25,25,2
5,18,18,22,25,25,25,25,20,20
,20
960 DATA 20,20,22,23,22,20,2
2,22,22,22,22,22,22,22,18,18
,22
970 DATA 25,30,30,30,27,27,2
7,27,27,23,23,25,27,25,25,25
,25
980 DATA 25,25,25,25,18,18,2
2,25,25,25,25,20,20,20,20,20
,22
990 DATA 23,22,20,18,18,18,1
8,18,18,18,0,-1
1000 ! BASS PART
1010 DATA 0,0,0,0,0,11,23,23,1
1,18,18,11,18,0,0,0,0,6,18,1
8,1,18,18,6,18
1020 DATA 0,0,0,0,1,17,17,1,
13,13,1,13,1,1,3,5,6,13,13,1
,13,13,6,13
1030 DATA 0,0,0,0,0,11,23,23,1
1,18,18,11,18,0,11,10,8,6,18
,18,1,18,18,6,18
1040 DATA 0,6,5,3,1,17,17,1,
13,13,1,13,1,1,3,5,6,10,10,1
1,11,11,10,0
1050 !MID PART
1060 DATA 0,0,0,0,0,27,27,0,
23,23,0,23,0,0,0,0,0,22,22,0
,22,22,0,22
1070 DATA 0,0,0,0,0,20,20,0,
17,17,0,17,0,0,0,0,0,18,18,0
,18,18,0,18,30,30,29,28
1080 DATA 27,27,27,0,23,23,0
,23,0,0,0,0,0,22,22,0,22,22,
0,22,0,0,0,0,0,20,20,0,17,17
,0,17
1090 DATA 17,17,18,20,18,13,
13,15,15,14,13,0
1100 ! NOTE LENGTHS
1110 DATA 1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1,1
1120 DATA 1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1
1130 DATA 1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1
1140 DATA 1,1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1
1150 ! *** QUEEN ***
1160 ! SOP PART
1170 DATA 25,25,27,24,25,27,
29,29,30,29,27,25,27,25,24,2
5,25,25,25,27,29,29,30,30
```

```
1180 DATA 32,32,32,32,30,29,
30,30,30,30,29,27
1190 DATA 29,30,29,27,25,29,
29,29,30,32,34,30,29,27,27,2
5,0,-1
1200 ! BASS PART
1210 DATA 0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,13,8,8,13,8,8,6,
5,3
1220 DATA 1,5,8,13,8,1,8,12,
15,8,3,8,13,15,13,12,10,8,6,
5,3,1,6,3,8,8,8,1,0
1230 ! MID PART
1240 DATA 0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,17,17,17,17,24,2
5,25,25,25
1250 DATA 29,29,29,29,27,25,
24,27,24,24,25,24,20,20,20,2
4,25,25,25,25,24,23,25,22,25
,24,18,17,0
1260 ! NOTE LENGTHS
1270 DATA 1,1,1,1.5,.5,1,1,1
,1,1.5,.5,1,1,1,1,.5,.25,.25
,.5,.5,.25,.25,.25,.25
1280 DATA 1,1,1,1.5,.5,1,1,1
,1,1.5,.5,1,1,.5,.5,.5,.5,.5
,.5,.5,.5,1,.5,.5,1,.5,.5,2,
1
1290 RESTORE 720 :: T=6 :: R
ETURN
1300 RESTORE 920 :: T=5 :: R
ETURN
1310 RESTORE 1150 :: T=4 ::
RETURN
```

MUSIC CONTROL PROGRAM:

T.I. basic.

```
100 REM THIS IS A STRAIGHT C
ONVERSION OF EX. BASIC PROG-
SO SAME 'REMS' AT HEAD OF TH
AT PROG APPLY
110 REM ALSO IT TENDS TO INT
ERPRET A LITTLE SLOWER THAN
EX. BASIC WHICH GIVES A SLIG
HTLY 'STILTED' RESULT
120 REM
130 REM ********************
***
140 REM *MUSIC CONTROL PROGR
AM*
150 REM *  FOR TI99
  *
160 REM *      DEC.1984
  *
170 REM ********************
***
180 REM ***** M D BIRKETT **
***
190 REM ********************
***
200 REM
210 DIM F(51)
220 DIM SOP(140)
230 DIM BASS(140)
240 DIM MID(140)
250 DIM LENGTH(140)
260 DIM L(140)
270 A=2^(1/12)
280 FOR I=1 TO 50
290 F(I)=110*A^(I-1)
300 NEXT I
310 F(0)=20000
320 CALL CLEAR
330 PRINT "***AN EMDEEBEE PR
ODUCTION***":"":""
340 PRINT "  YOUR TI.99/4A W
ILL PLAY  ":""
350 PRINT "       A SELECTIO
N OF      "
360 PRINT "":"     'MELODIES
 FOR YOU'    ":"":""
370 PRINT "      ***********
*****      ":"":"":""
380 PRINT "":" 1). TEXAS ROS
E * hit1,2or3"
390 PRINT "                 *
          "
400 PRINT " 2). OLD SMOKEY *
 and press":"
 *          "
410 PRINT " 3). THE QUEEN  *
 ENTER key"
420 PRINT "":"":""
430 INPUT "  YOUR CHOICE ":C
H
440 ON CH GOSUB 1430,1460,14
90
450 CALL CLEAR
460 PRINT "HOW MANY VERSES D
O YOU WANT"
470 INPUT V
480 PRINT "":""
490 PRINT "TEMPO REQD.(1 slo
w-10 fast)":"":"          (
i suggest ";T;" )"
500 INPUT TEM
510 PRINT "":"":"":"":"":"":
"":"":"":"   *** LOADING  DA
TA ***"
520 CALL SOUND(-75,880,1)
530 IF CH=3 THEN 540 ELSE 56
0
540 TEMPO=650-(TEM*20)
550 GOTO 570
560 TEMPO=325-(TEM*20)
570 TUNELEN=0
580 FOR NOTE=1 TO 140
590 TUNELEN=TUNELEN+1
600 READ SOP(NOTE)
610 IF SOP(NOTE)<>-1 THEN 62
0 ELSE 630
620 NEXT NOTE
630 TUNELEN=TUNELEN-1
640 FOR NOTE=1 TO TUNELEN
650 READ BASS(NOTE)
660 NEXT NOTE
670 FOR NOTE=1 TO TUNELEN
680 READ MID(NOTE)
690 NEXT NOTE
700 FOR NOTE=1 TO TUNELEN
710 READ LENGTH(NOTE)
720 NEXT NOTE
730 REM LOOP FROM 650 CONVER
TS NOTE LENGTHS FROM BEAT VA
LUES TO 1/1000 ths. OF A SEC
OND
740 FOR NOTE=1 TO TUNELEN
750 L(NOTE)=LENGTH(NOTE)*TEM
PO
760 NEXT NOTE
770 CALL CLEAR
780 PRINT "     **HERE IT CO
MES**":"":"":"":"":"":"":
"":"":""
790 FOR VERSE=1 TO V
800 FOR TUNE=1 TO TUNELEN
810 CALL SOUND(L(TUNE),F(SOP
(TUNE)),0,F(BASS(TUNE)),3,F(
MID(TUNE)),4)
820 NEXT TUNE
830 NEXT VERSE
840 GOTO 210
850 REM *YELLOW ROSE OF TEXA
S*
860 REM SOP PART
870 DATA 25,23,22,25,25,25,2
7,25,25,23,22,25,30,30,30,32
,34,34,34
880 DATA 25,25,34,34,34,34,3
2,32,30,29,30,32,32,32,34,32
,32,32
890 DATA 25,23,22,25,25,25,2
7,25,25,23,22,25,30,30,30,32
,34,34,34
900 DATA 25,25,35,35,35,35,3
4,37,35,34,32,30,25,24,25,34
,32,30,0,-1
910 REM BASS PART
920 DATA 0,0,6,18,1,18,6,18,
1,17,6,18,1,1,18,18,6,18,18
930 DATA 0,13,18,1,18,13,17,
1,18,13,12,13,13,15,15,13,11
,10
940 DATA 8,8,6,18,1,18,6,18,
1,17,6,1,3,3,5,5,6,1,6
950 DATA 0,1,0,13,0,6,0,11,1
1,0,0,13,13,0,0,1,1,6,0
960 REM MID PART
970 DATA 0,0,18,22,22,22,23,
22,22,20,18,22,22,22,22,23,2
5,25,25
980 DATA 22,22,25,25,25,25,2
3,23,22,20,22,23,23,23,25,23
,23,23
990 DATA 22,20,18,22,22,22,2
3,22,22,20,18,22,22,22,22,23
,25,25,25
1000 DATA 22,22,25,25,29,30,
30,27,27,27,27,25,22,22,22,2
5,23,22,0
1010 REM NOTE LENGTHS
1020 DATA .5,.5,1,1,1,1,1,1,
1,1,1,1,.5,.5,.5,.5,1,1,1
1030 DATA 1,1,1,1,1,1,1,1,1,
1,1,.5,.5,.5,.5,1,1,1
1040 DATA .5,.5,1,1,1,1,1,1,
1,1,1,1,.5,.5,.5,.5,1,1,1
1050 DATA 1,1,1,1,1,1,1,.5,.
5,.5,.5,.5,.5,.5,.5,1.5,.5,2
,1
1060 REM *ON TOP OF OLD SMOK
EY*
1070 REM SOP PART
1080 DATA 18,18,22,25,30,30,
30,27,27,27,27,27,23,23,25,2
7,25
1090 DATA 25,25,25,25,25,25,
25,18,18,22,25,25,25,25,20,2
0,20
1100 DATA 20,20,22,23,22,20,
22,22,22,22,22,22,22,22,18,1
8,22
1110 DATA 25,30,30,30,27,27,
27,27,27,23,23,25,27,25,25,2
5,25
1120 DATA 25,25,25,25,18,18,
22,25,25,25,25,20,20,20,20,2
0,22
1130 DATA 23,22,20,18,18,18,
18,18,18,18,0,-1
1140 REM BASS PART
1150 DATA 0,0,0,0,11,23,23,1
1,18,18,11,18,0,0,0,0,6,18,1
8,1,18,18,6,18
1160 DATA 0,0,0,0,1,17,17,1,
13,13,1,13,1,1,3,5,6,13,13,1
,13,13,6,13
1170 DATA 0,0,0,0,11,23,23,1
1,18,18,11,18,0,11,10,8,6,18
,18,1,18,18,6,18
1180 DATA 0,6,5,3,1,17,17,1,
13,13,1,13,1,1,3,5,6,10,10,1
1,11,11,10,0
1190 REM MID PART
1200 DATA 0,0,0,0,0,27,27,0,
23,23,0,23,0,0,0,0,0,22,22,0
,22,22,0,22
1210 DATA 0,0,0,0,0,20,20,0,
17,17,0,17,0,0,0,0,0,18,18,0
,18,18,0,18,30,30,29,28
1220 DATA 27,27,27,0,23,23,0
,23,0,0,0,0,0,22,22,0,22,22,
0,22,0,0,0,0,0,20,20,0,17,17
,0,17
1230 DATA 17,17,18,20,18,13,
13,15,15,14,13,0
1240 REM NOTE LENGTHS
```

```
1250 DATA 1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1,1
1260 DATA 1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1
1270 DATA 1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1
1280 DATA 1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,
1
1290 REM *** QUEEN ***
1300 REM SOP PART
1310 DATA 25,25,27,24,25,27,
29,29,30,29,27,25,27,25,24,2
5,25,25,25,27,29,29,30,30
1320 DATA 32,32,32,32,30,29,
30,30,30,30,29,27
1330 DATA 29,30,29,27,25,29,
29,29,30,32,34,30,29,27,27,2
5,0,-1
1340 REM BASS PART
1350 DATA 0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,13,8,8,13,8,8,6,
5,3
1360 DATA 1,5,8,13,8,1,8,12,
15,8,3,8,13,15,13,12,10,8,6,
5,3,1,6,3,8,8,8,1,0
1370 REM MID PART
1380 DATA 0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,17,17,17,17,24,2
5,25,25,25
1390 DATA 29,29,29,29,27,25,
24,27,24,24,25,24,20,20,20,2
4,25,25,25,25,24,23,25,22,25
,24,18,17,0
1400 REM NOTE LENGTHS
1410 DATA 1,1,1,1.5,.5,1,1,1
,1,1.5,.5,1,1,1,1,.5,.25,.25
,.5,.5,.25,.25,.25,.25
1420 DATA 1,1,1,1.5,.5,1,1,1
,1,1.5,.5,1,1,.5,.5,.5,.5,.5
,.5,.5,.5,1,.5,.5,1,.5,.5,2,
1
1430 RESTORE 860
1440 T=6
1450 RETURN
1460 RESTORE 1060
1470 T=5
1480 RETURN
1490 RESTORE 1290
1500 T=6
1510 RETURN
```

Yours Faithfully,

Malcolm D. Birkett

Well, there we are, we hope that you have found Malcolm's program useful and entertaining. Keep tuned in for the next issue, and don't forget to send in any interesting tips or routines that you discover.

Have you recently had your joystick movement blighted?

Have you been afflicted in such a way as to have upward motion prevented?

Well, we believe that this may be the culprit. Yes, this harmless looking character - Alfer Lock - has the power to ruin the prospects of any unsuspecting reader, if he is not kept under control.

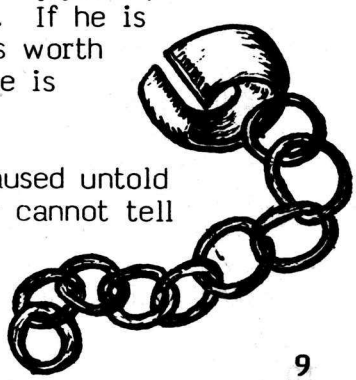
For your information, we will describe here the events that usually occur when he is threatening, so that you may see the tell-tale signs, and so avoid falling foul of him.

Firstly, he is moody. He will get depressed. In fact, this is usually the case, and under normal circumstances one would worry if he were not down. Since his last release he has been in a more or less permanent state of depression, and has had little or no effect on events around him. But get your joystick out and he really puts the mockers on things! He simply does not want people using them while he is down.

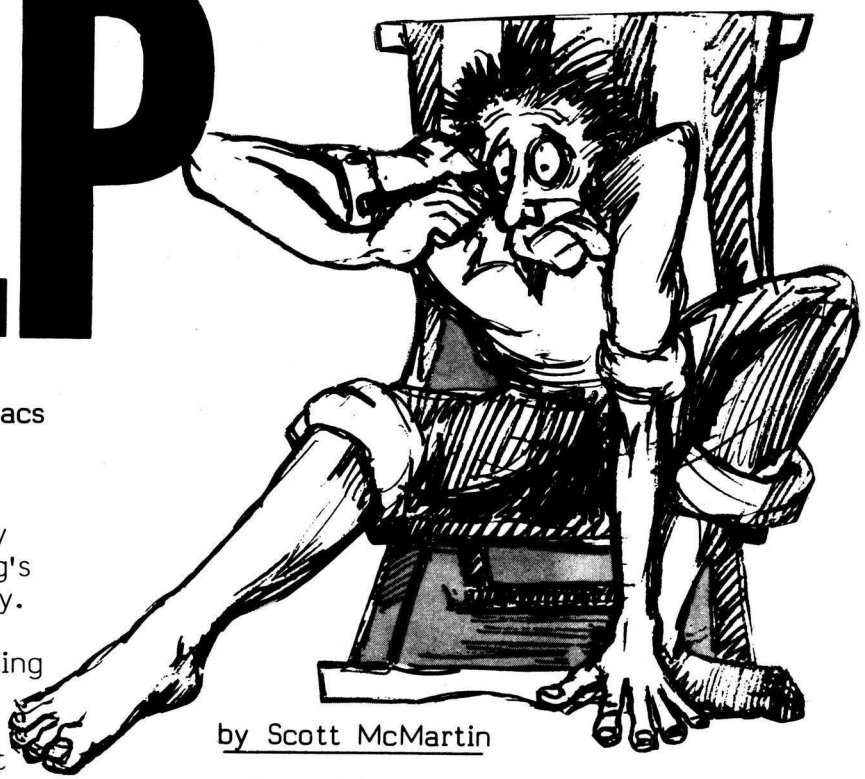
There seems to be no compromise folks. If you desire to use your joystick, you have no choice but to ensure that he is not depressed at the time. If he is 'up' he will allow you all the freedom of movement you desire, but it's worth remembering that when you are not using it you are better off when he is depressed.

Don't be fooled citizens. He may appear harmless, but he has caused untold misery and frustration in many homes across the nation, and we simply cannot tell where or when he will strike next.

You have been warned.....



HELP



A regular column for adventure maniacs

by Scott McMartin

First off, I owe an apology for missing last month's deadline. I may even have caused a delay in the mag's release date. To all concerned, sorry. So this month's column, (and next's) will be larger to encompass the missing articles' points.

One thing I have found difficult to pin-point is "What makes a good adventure?". In my mind, it's a number of things - a masterful plot from a devious/warped author, a wry sense of humour, and 'usually' a lot of computer memory for the essential narrative. The reason I bring this point is that next month I'll be reviewing some of the 'console-only' adventures around for the 99/4a owner who has not the 'folding stuff' to expand his system. These are all TI Basic programs by UK software houses like Apex, Virgin etc. I have heard of a few people having severe problems with Virgins 'Starship Supernova' from their FUN-PAC 2. I'll be looking at it in the next article.

I am, I'll admit, a little skeptical as to what they have achieved in the very limited confines of the 13k available to the console-only user, but I am prepared to be proved wrong! God knows I've been wrong before. (CRIKEY - Ed.) If you have any views on these adventures, I'd like to hear them, maybe I'm alone in my belief?

I don't recall reading a review of the 'Return to Pirates Isle' module in the last edition, as I was informed there would be? Did our esteemed editors forget, or are they waiting till they solve it! Well, with the help of the telephone and H.E.L.P reader Ian Goodall from Norwich I eventually solved it a couple of weeks ago. See, even I need help, quite often in fact. (DOUBLE CRIKEY - Ed.)

Steve from Leeds recommends stocking up on bandages for your typing fingers before attempting 'Return to Pirates Isle', I agree. He was one of the readers having problems with 'Adventureland'. The fish are being awkward and dying on him. Try casting one of your treasures to the sea, and fish will die with out water don't forget! As for your other problem, a very common one that stumped me for a bit: the bear with the sweet tooth, well he's a very nervous bear so don't go raising your voice, will you?

The other adventure causing some problems just now is one of my favourites: 'Ghost Town'. Not only does this adventure require you to find 13 treasures, but also has a bonus system out of 50. You dont need to have 50 points plus 13 treasures to win the game, just the 13 treasures, but I have never scored over 30pts. Have any of you ever managed to score 50pts and get all the treasure? Maybe its impossible and Scott put it in to dement us all with? I wouldn't put it past him.

Mr Rushbrook of Norwich has already 'cracked' some of the harder bits of 'Ghost Town' like the mirror and the safe, but is stuck with the snake and the jail. I think your problem with the snake has been a case of 'ignoring the easy way', I think it calls for a showdown. The jail is bolted from the inside, a friend's footwear may prove to be magnetic.

I got a call from Mr Copeland from Brandon who was at his wits end with ' Pyramid of Doom'. It demonstrates a clever piece of psychology on Mr Adam's part. As you get close to finishing 'Pyramid' you find that you are lacking a couple of treasures to make up your required total. As it takes some time to get the treasures you've got, you're usually loathe to part with them. In 'Pyramid' you must sacrifice a valuable treasure to get the last items. This wouldn't normally occur to many adventurers, so they usually come to a screeching halt. Clever innit? Oh, and as for those wanting advice about the purple worm, simple answer: leave it well alone. It is of no significance, and letting it out will only kill you. But you know adventurers, we all think EVERYTHING has a purpose, well the purple worm hasn't. Take my word for it.

Where does the 'future' of adventures lie? Is it larger and larger textual adventures like those by Level 9 (over 700 locations), or in the growing trend of graphic adventures, or in the development of semi-intelligent computer-created friends/adversaries with whom you can communicate (first seen in the now legendary Hobbit)? Well, in my mind the newest and most thrilling advancement in computing, and suprisingly in adventures, is telecommunications. They say that connecting your micro to the 'outside world' via telephone will be the next boom in this growth market. What has this got to do adventures you ask? MUD. If you've been reading computer magazines over the last 4 months you won't have failed to read something about this game.

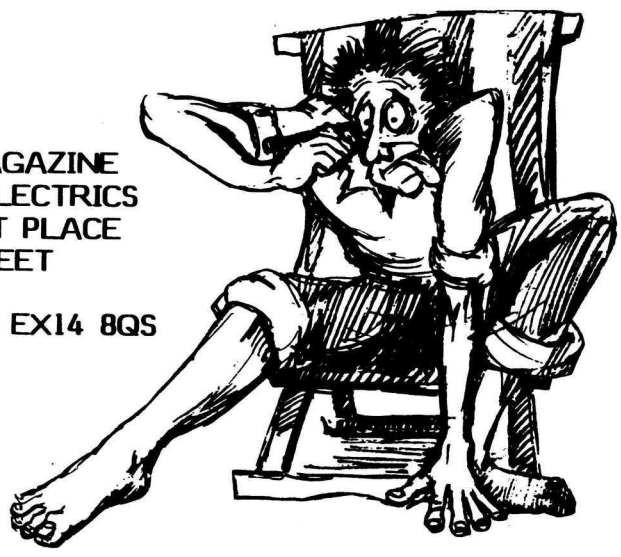
I won't go into too much detail here, as it is probably outside the reach of many readers, but if there is sufficient interest I shall come back to this in another article. It is possible with a 99/4A + RS232 (either stand alone or in the Expansion box) + 300bd modem + some terminal software (either the Terminal Emulator 2 module or disk based software). You then, via your phone line, connect with Essex University DecSystem 10 mainframe to play their Free adventure, MUD. What is unusual about this adventure is that there are other people in the adventure as well as you, at the same time as you. These are not computer generated personas, but other people sitting in front of their tvs/monitors playing too. You can communicate with them, kill them (or try), steal from them, kiss them, follow them and many many other things in this 500 location adventure. So you are pitting your wits not only against the writer, but REAL adversaries. Hard to explain, definitely one to experience. If your wallet can withstand it, let alone your mind, it's well worth trying. As I said, I will let you know more if required, as usual drop me a line.

Have any of you written your own adventures? I would be interested in looking at the way you are achieving certain routines. Most TI basic adventures (or ExBas for that matter) have used the same skeleton program and have modified it with their own text. If you have written any adventures you think are challenging, bug-proof and interesting then why not drop them to me at the below address and we will print the better ones. Originality is important, and will be a prime consideration in the final decision. I look forward to checking out your adventures, don't forget to include a step-by-step solution to the adventure as well, just in case!

Till next month.

Scott.

HELP
99/4A MAGAZINE
PARCO ELECTRICS
4 DORSET PLACE
NEW STREET
HONITON
DEVON EX14 8QS



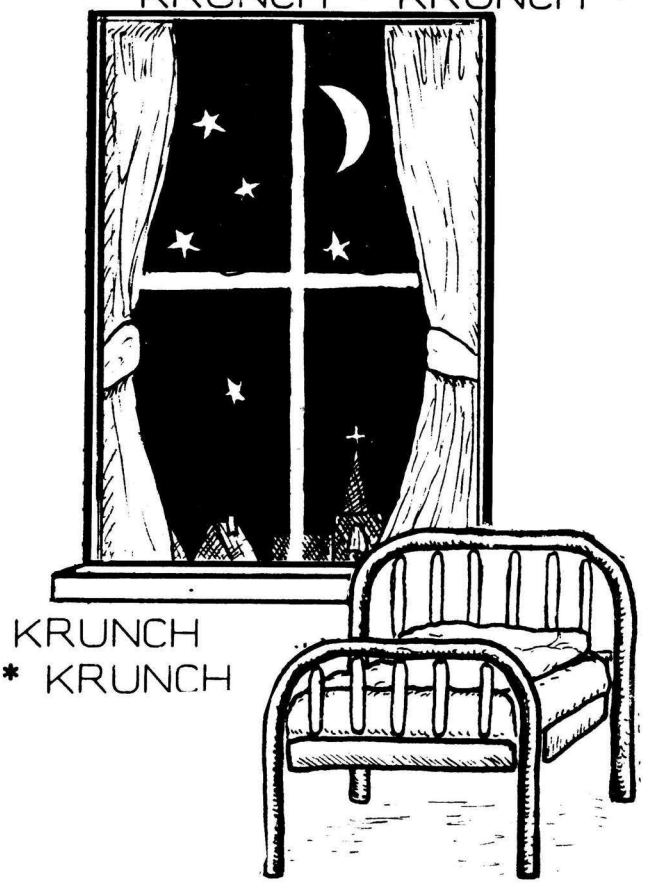
KEYBOARD KRUNCHERS

We like to think that the listings you find in this magazine are of a high standard - certainly your comments to date have been favourable - and the efforts in this issue are no exception.

As usual we have chosen a variety of programs, so that differing needs and tastes may be met. As would be expected there are games: SONAR and TREASURES of XEROX; and utilities: STATISTICAL GRAPHICS and TELEPHONE TIMER.

Also included below are some detailed instructions for Spontaneous Reaction, which should have accompanied the listing in the last issue. Sorry.

'KEYBOARD KRUNCHERS'
99/4a Magazine
Parco Electrics
4 Dorset Place
New Street
Honiton
Devon
EX14 8QS



****
* SPONTANEOUS REACTION Malcolm Adams *
****
***** (listing in last issue) *********
****

TI BASIC
or EXTENDED BASIC
Speech Synth option
Joystick option

An addictive and exciting modern strategy game. A battle of logical concentration between you and your opponent, with the final aim being to take complete possession of the playing area. You may think that you have complete control of the board, but the game can be completely reversed on the last move of the game!

Written in console Basic, the game will also run in Extended Basic (faster response). Keyboard or Joysticks can be selected and a colour or b/w TV can be used. The game is for one or two players, and an option to use speech (with Speech Editor or Extended Basic) is incorporated.

RULES

The game is played on a 7 x 7 rectangular board. Half of the outer edges occupied by one player, the other half being occupied by the opponent. The board must be completely covered by one players' pieces before the game is won. A changing colour bar will randomly choose who moves first.

Each of the squares of the board has a reaction number associated with it. This number is derived from the number of adjacent squares touching it. For example, the corner squares have a reaction value of 2, the sides a value of 3, and all the inner squares a value of 4. The player to go moves by moving his colour-coded cursor around the board, when in position another piece is added to the board. A new piece can be added only to an empty square or to a square already occupied by the moving player. The number of pieces on each square is indicated by the number shown. When a square has reached its reactive value, all of its pieces are shifted onto its adjacent squares and therefore adding the value of the adjacent squares and also capturing them if they belong to the opponent.

The square that has 'reacted' now has a value of '0' but retains the players' possession. The adjacent squares may now be at 'reaction' point, so these will react and a spontaneous chain reaction may be set up.

MOVING THE CURSOR

Joysticks - Player 1 uses joystick 1. Player 2 uses joystick 2. Eight directions are active, and when in position press the fire button.

Keyboard (split) - Player 1 uses the usual eight direction keys on the left side of board (E X S D W R Z C) and presses 'Q' when in position. Player 2 uses equivalent keys on right hand side (I M J K U O N ,) and presses Y when in position.

****

Some of you probably worked that lot out for yourselves; if you did not then please accept our apologies. Now you have the details you will be able to enjoy the game to the full, and appreciate just why it won our recent competition.

****
** STATISTICAL GRAPHICS ** Sam Nash ***
****

TI BASIC

People who see this program find it hard to believe that it is written in TI BASIC. It answers the need so often expressed for a Graphing program, and does so in some style. There are four types of graph to choose from, and your results may be stored in cassette file form. Full marks to Sam Nash for one of the most eye-catching efforts to pass through our door. Look out for some games from the same author soon.

On the menu are 5 choices:-

A Block diagram (max 4 items)
B Horizontal bar diagram (max 7 items)
C Histogram (max 12 items)
D 3-D bar diagram (here the values are presented to within 2.5% accuracy - max 6 items)
E Input from previously saved diagram.

After pressing A,B,C or D you will be asked to input number of items, then the 'title', (enter 0 and you will go back to the menu.) For each item you will be asked for a label or name and its value, (enter 0 for label and you go back to the menu) then the colour you require this item to be represented by.

For choices B and C a scale will be required, this scale governs the size of the bars, and the divisions on the vertical axis in the histogram; if the scale entered is too low the computer will ask for a higher value: Due to the restrictive 32 x 24 screen, values with more than 6 figures e.g. 1800000 are best abbreviated and on the title a note given (e.g. on the title "Oil Production in Millions of Barrels" entering 1.5 for 1500000, 21.8 for 21800000 etc.) If abbreviations are required the computer will ask for them. After the diagram has been displayed, pressing any key will take you to the request whether you want to save this diagram on cassette file. Follow the instructions if you do, but remember to use a previously unused portion of tape, and keep careful note of where the tape counter is for this particular diagram.

Option E on the menu enables the operator to input previously saved diagrams. (see above) Full instructions will appear on the screen.
N.B. Be sure to wind cassette to correct starting position for the particular diagram.

* note - use upper-case letters, Alpha-Lock down

** note - some punctuation characters can not be used; full-stop, comma and most others are o.k.

****
** TELEPHONE TIMER *** Clive Tucker ***
****

EXTENDED BASIC
32k RAM option

1. General Information

The object of this program is to enable the user to monitor the cost of telephone calls as they are made. The calls are timed by a simple incremental

counter that checks to see if the count has reached a particular value before the cost of a unit is added to the running total. The unit duration depends on the selected check value which itself depends on both the charge rate and the charge code of the call.

The charge rate is selected, as are all user options, from a menu displayed on-screen. The choice is made depending on the time at which the call is to be made:

Cheap rate	6pm-8pm weekdays, all day Saturday and Sunday
Standard rate	8am-9am, 1pm-6pm
Peak rate	9am-1pm

(these rates may differ during public holiday periods - consult B.T)

The charge code of the call is shown in the 'Dialling Codes booklet in terms of a letter:

L	Local
a	Under 35 miles (56 kilometres)
b	Over 35 miles/Channel Isles from mainland
b1	Over 35 miles(directed along low-cost routes

The program includes a letter for calls to the Republic of Ireland. Irish destinations are shown in the booklet with '(Ireland)' after the destination name.

Once the required codes have been selected, the program presents the user with the main display screen. This screen shows the selected charge code and charge rate, the unit duration and the cost of the call. The timer is started by pressing any key, where-upon an audible tone sounds and the cost of the call is updated. Each subsequent tone marks the beginning of a new cost unit, while the cost display is updated accordingly. The timer is halted again by pressing any key, where-upon a lower tone sounds. The user is then presented with a set of options:

1. Change charge rate
2. Change charge code
3. Reset cost to zero
4. Exit the program
5. See instructions

Selecting any of the above options (except 4) will return the user to the appropriate menu, and then back to the set of options shown above. Pressing any other key resets the timer, at which point the program is ready to time another call. Should B.T. ever decide to raise their unit cost (or even, in the light of their recent privatisation LOWER it??), lines 340 and 380 should be amended accordingly. (at present the cost of a unit is 5.405p inc. VAT)

2. List of variables

The main variables used in the program are:

CDE	code subscript
RTE	rate subscript
CDE$	code label
RTE$	rate label
PRD(RTE,CDE)	subscripted check value
PRD$(RTE,CDE)	subscripted check value label
TME	check value used in timing
CST	call cost
C	counter
CHC	menu choice
MEN	value used to check if charge code charge rate menus have been used for the first time
EX	speed conversion factor used to modify check values for use without memory expansion

3. How it works

The program can be segmented as follows:

100-140	Minimise pre-scan
150-220	Set up title screen
230-260	Initialise arrays, variables and characters
270-300	Prompt for instructions, charge rate and charge code
310-390	Timing sequence
420-570	Rate, code, unit duration and cost display
590-600	Cost display update
620-710	Charge rate menu
730-860	Charge code menu
880-1010	On-screen instructions
1030-1160	Main menu

****

****

** SONAR ********** Alan Jones **
****

Extended Basic
Joystick

On-screen instructions guide you to choose and activate a remote controller. When the game starts we see a submarine cross the screen, a call to Action-Stations and the submarine dives beneath the waves. It continues to move about underwater in an escape pattern designed to avoid capture. A sonar sight-mark appears on the screen which can be moved by operating the remote controller. The submarine's range is indicated in metres. The player must find the sub by searching for it with the sonar sight-marker and observing changes indicated in the range. An audible range signal is given, the frequency of which is dependant on range. The sub is captured when the fire-button is pressed whilst within a range of 5 metres. The program gives a measure of the time taken and stores the name of the running champion. Several players can compete for the fastest time or one player can strive to break his own record.

****

****
* TREASURES OF XEROX Christopher Rock *
****

TI BASIC

Recently, an invasion party from the planet Lyrax stole the Ten Golden Crowns from the king's temple. The Xeroid have chosen you to return the crowns to their rightful owner. The Lyrax are a wierd people, coming in different shapes and colours. They are clever but by no means can match you. As you begin on screen one and proceed to screen ten the number of ladders will decrease and the Lyrax mutate. Armed with five lives, your task on each screen is to reach the golden crown at the top. If you complete all ten screens you will hear the national anthem of Xerox and be asked if you want to play again. The latter will also happen if you lose all your lives. On each screen play will not commence until three short buzzes are heard. As you are not familiar with the planet problems arise. Throughout the game you will be coloured either red or green. If you are red you cannot go up ladders. To turn green you must go over one of the thin brown pills; one on each level. If a Lyrax of any kind runs over a pill, when you get to that level you will turn green and can therefore proceed upwards. On the first few screens of the game ladders lead from the bottom straight to the top. These ladders are situated in the middle of the screen. You can go from bottom to top without collecting any pills! Remember though, you must be green to get up the first ladder. The cleverest and fastest of all Lyrax are the Crunch Munch. These sit at the sides waiting to be activated by another Lyrax. Crunch Munch can only be activated when you and one particular Lyrax are on the same level. Keep an eye on the activating Lyrax. When a Crunch Munch has been activated (note there are two on each level and the one that is activated is decided at random) you can still move. If a Crunch Munch eats another Lyrax you cannot go over where the Lyrax was - it is still there but invisible until the Crunch Munch has stopped. The Crunch Munch stop at the central ladder and return to the sides of the screen. If you get to the top of the screen and land on the crown, stay there. When a Crunch Munch is moving on the top level you cannot get the crown until it is gone. If you are about to land on the crown and a Crunch Munch comes - get away quick! Points are awarded for climbing, surviving Crunch Munch attacks, and there is a bonus at the end of each screen. A few points are taken off for going downwards.

The game uses keys, and you can choose your own by entering the ASCII codes when prompted. The cursor keys E S X and D are coded 69 83 88 and 68 respectively, for instance.

****

We think you will be impressed with the programs that we have listed here, but remain open as always to comments, criticisms, and queries.

```
100 CALL SCREEN(2)
110 GOSUB 3840
120 PRINT " ****************
********": :"   STATISTICAL
GRAPHICS": :" **************
**********": : : : : : :
130 PRINT TAB(8);"BY SAM NAS
H.JAN 85": : : : : : :
140 GOSUB 3890
150 FOR DL=1 TO 500
160 NEXT DL
170 OPTION BASE 1
180 DIM V(12),VV(12),D$(12),
CC(12)
190 SS=0
200 CL=0
210 C=0
220 FOR N=1 TO 12
230 V(N)=0
240 VV(N)=0
250 NEXT N
260 GOSUB 3840
270 PRINT "    STATISTICAL G
RAPHICS": : : :"PRESS": :"A.
.BLOCK DIAGRAM": :"B..HORIZO
NTAL BAR DIAGRAM": :
280 PRINT "C..HISTOGRAM": :"
D..3D BAR REPRESENTATION...
   [AUTOMATIC Z GENERATOR]":
 : :"E..INPUT FROM CASSETTE
FILE": : : :"F..TO FINISH":
: :
290 GOSUB 3890
300 CALL KEY(3,K,S)
310 IF (K<65)+(K>70)THEN 300
320 IF K=70 THEN 4580
330 CALL CLEAR
340 A$="FFFFFFFFFFFFFFFF"
350 M$="00000000000000000FFF
FFFFFFFFFFF"
360 MM$="00080C0E0F0F8FCFE"
370 FOR N=96 TO 136 STEP 8
380 CALL CHAR(N,A$)
390 NEXT N
400 CALL CHAR(40,"0000000000
0000FF")
410 CALL CHAR(39,"C0C0C0C0C0
C0C0FF")
420 CALL CHAR(109,"0000FFFFF
FFFFFFF")
430 CALL CHAR(110,"FFFFFFFFF
FFF")
440 CALL CHAR(41,"0101010101
010101")
450 L=0
460 IF K=69 THEN 1320
470 K=K-64
480 GOSUB 3840
490 PRINT "ENTER NUMBER OF I
TEMS": :"MAXIMUM OF";4*K+(K=
2)+10*(K=4): :"ENTER 0 FOR M
ENU"
500 GOSUB 3890
510 INPUT B
520 IF B<0 THEN 490
530 IF B=0 THEN 260
540 IF B<(4*K+(K=2)+10*(K=4)
+1)THEN 560
550 GOTO 490
560 GOSUB 3840
570 PRINT "PLEASE ENTER GRAP
H TITLE ": :
580 GOSUB 3890
590 LM=32
600 ML=30
610 MT=90*(K=2)*(B<4)-120*(K
=1)+60*(K=2)*(B>3)+90*(K=3)*
(B>6)+90*(K=3)*(B<5)-60*(K=3
)*(B>4)*(B<7)-90*(K=4)
620 X=11-(MT/30)
630 GOSUB 4360
640 IF ZK=6 THEN 560
650 G$=Z$
660 FOR N=1 TO B
670 GOSUB 3840
680 PRINT "ENTER SHORT LABEL
 TO ITEM";N
690 PRINT :"ENTER 0 FOR MENU
": :
700 GOSUB 3890
710 ML=29*(K=3)*(B<7)+9*(K=3
)*(B>6)-11*(K=1)-10*(K=4)-17
*(K=2)
720 LM=-31*(ML=29)-11*(ML=9)
-13*(K=1)-19*(K=2)-12*(K=4)
730 X=-6*((ML=29)+(ML=9)+(K=
2))-5*(ML=10)-4*(ML=11)+4
740 MT=-29*(ML=29)-9*(ML=9)-
20*(K=4)-33*(K=1)-17*(K=2)
750 GOSUB 4360
760 IF Z$="0" THEN 260
770 IF ZK=6 THEN 670
780 D$(N)=Z$
790 IF D$(N)="0" THEN 270
800 GOSUB 3840
810 PRINT "ENTER VALUE FOR":
 :D$(N): :
820 GOSUB 3890
830 INPUT V(N)
840 IF (V(N)<1000000)*(K=3)+
(K<>3)THEN 940
850 GOSUB 3840
860 PRINT "THIS GRAPH FEATUR
ES A SCALE ON THE LH SIDE OF
 THE SCREENTHE SCALES MAXIMU
M LENGTH"
870 PRINT "IS 6 CHARACTERS.S
O 1000000  WILL  CAUSE AN ER
ROR.": :"CAN YOU GO BACK TO
THE START"
880 PRINT "AND RE-ENTER THE
DATA WITH  WORKABLE VALUES":
 : :"EG..    ENTER 1 FOR 100
0000 2.3 FOR 2300000  ETC.."
890 PRINT "ON THE TITLE OF T
HE GRAPH   STATE ""IN MILLIO
NS"" OR   ""  10S OF MILLION
S ETC"""
900 PRINT : :"PRESS ANY KEY
TO CARRY ON"
910 GOSUB 3890
920 CALL KEY(3,K,S)
930 IF S=0 THEN 920 ELSE 190
940 VV(N)=V(N)
950 IF V(N)<L THEN 980
960 L=V(N)
970 CALL CLEAR
980 IF (B>6)+(K=2)THEN 1100
990 GOSUB 3840
1000 PRINT "ENTER COLOR CHOI
CE FOR": :D$(N): :
1010 GOSUB 3810
1020 GOSUB 3890
1030 INPUT C
1040 CALL CLEAR
1050 IF (C>2)*(C<16)THEN 108
0
1060 PRINT C;" IS A WRONG CO
DE": :
1070 GOTO 1000
1080 CC(N)=C
1090 CALL COLOR(8+N,CC(N),1)
1100 NEXT N
1110 IF (B<7)*(K=3)THEN 1250
1120 IF (K=4)+(K=1)THEN 1470
1130 GOSUB 3850
1140 PRINT "PLEASE ENTER THE
 COLOR FOR  ALL THE ITEMS IN
": :G$: :
1150 GOSUB 3810
1160 GOSUB 3890
1170 INPUT CL
1180 CALL CLEAR
1190 IF (CL>2)*(CL<16)THEN 1
220
1200 PRINT CL;"IS A WRONG CO
DE": :
1210 GOTO 1140
1220 FOR N=9 TO 16
1230 CALL COLOR(N,CL,1)
1240 NEXT N
1250 GOSUB 3850
1260 PRINT "PLEASE ENTER A S
CALE": :
1270 GOSUB 3890
1280 INPUT S
1290 IF ((L/S)<=(12-4*(B<7))
)*(K=3)+(K=2)*((L/S)<31)THEN
 1470
1300 PRINT "SCALE TOO LOW":
:
1310 GOTO 1260
1320 PRINT "**AT THE INSTRUC
TION,REWIND   THE CASSETTE T
APE TO THE    DATA REQUIRED
FOR INPUT.    THEN-ENTER"
1330 OPEN #2:"CS1",INTERNAL,
INPUT ,FIXED 192
1340 INPUT #2:G$,L,B,C,CL,K,
S
1350 FOR N=1 TO B
1360 INPUT #2:V(N),VV(N),CC(
N),D$(N)
1370 NEXT N
1380 CLOSE #2
1390 IF CL THEN 1440
1400 FOR N=1 TO B
1410 CALL COLOR(8+N,CC(N),1)
1420 NEXT N
1430 GOTO 1470
1440 FOR N=9 TO 16
1450 CALL COLOR(N,CL,1)
1460 NEXT N
1470 ON K GOTO 2530,2120,148
0,3100
1480 IF B>6 THEN 1550
1490 VP=9-B+(B<4)
1500 SC=5-(B<4)
1510 SR=18+(6-B)+(B<4)
1520 SP=4-(B<4)
1530 HZ=3-(B<4)
1540 GOTO 1600
1550 VP=4
1560 SC=6-(B<10)
1570 SR=15
1580 SP=2-(B<9)
1590 HZ=1-(B<9)
1600 CALL CLEAR
1610 CALL VCHAR(VP,7,39,12-4
*(B<7))
1620 N=0
1630 FOR X=SR TO VP STEP -2
1640 CALL HCHAR(X,8,40,24)
1650 GOSUB 4210
1660 NEXT X
1670 CALL HCHAR(VP-1,7,40,25
)
1680 C$=G$
1690 Y=2
1700 X=1
1710 GOSUB 3930
1720 X=SR+1-(B<4)
1730 FOR N=1 TO B
1740 IV=INT(V(N)/S)
1750 RM=V(N)/S-IV
1760 P=INT(RM*8)+1
1770 P=P*2
1780 FR=SR-IV+1
1790 C$=D$(N)
1800 IF B>6 THEN 1860
1810 Y=3
1820 CALL HCHAR(X,2,88+8*N)
1830 GOSUB 3930
1840 X=X+1
1850 GOTO 1890
1860 X=16
1870 Y=SC+SP*N
1880 GOSUB 4300
1890 FOR BL=SR TO FR STEP -1
1900 IF B>6 THEN 1930
1910 CALL HCHAR(BL,SC+SP*N,8
8+8*N,HZ)
1920 GOTO 1940
1930 CALL HCHAR(BL,SC+SP*N,9
6,HZ)
1940 NEXT BL
1950 IF V(N)/S=INT(V(N)/S)TH
EN 2040
1960 A$=SEG$(M$,P,16)
1970 IF A$="0000000000000000
" THEN 2040
1980 IF B>6 THEN 2020
1990 CALL CHAR(88+8*N+1,A$)
2000 CALL HCHAR(BL,SC+SP*N,8
8+8*N+1,HZ)
```

```
2010 GOTO 2040
2020 CALL CHAR(96+N,A$)
2030 CALL HCHAR(BL,SC+SP*N,9
6+N,HZ)
2040 NEXT N
2050 CALL KEY(3,KK,SU)
2060 IF SU=0 THEN 2050
2070 GOSUB 3840
2080 PRINT "IF THIS IS A NEW
 GRAPH WOULDYOU LIKE TO SAVE
 IT ON":"CASSETTE FILE?": :"
Y..YES": :"ANY OTHER KEY NO"
: :
2090 GOSUB 3890
2100 INPUT Y$
2110 IF Y$="Y" THEN 3680 ELS
E 190
2120 SR=1-2*(B<4)
2130 SP=3-(B<4)
2140 VZ=1-(B<4)
2150 X=1
2160 Y=2
2170 CALL CLEAR
2180 CALL VCHAR(4-3*(B<4),1,
41,B*3-3*(B<4))
2190 C$=G$
2200 GOSUB 3930
2210 FOR N=1 TO B
2220 X=SR+N*SP
2230 IV=INT(V(N)/S)
2240 RM=V(N)/S-IV
2250 P=2*(INT(RM*8)+1)
2260 CALL HCHAR(X,2,109,IV)
2270 FOR ZV=1 TO VZ
2280 CALL HCHAR(X+ZV,2,96,IV
)
2290 NEXT ZV
2300 CALL HCHAR(X+ZV,2,110,I
V)
2310 A$=SEG$(MM$,P,2)
2320 AA$=A$&A$&A$&A$&A$&A$&A
$&A$
2330 CALL CHAR(96+N,AA$)
2340 FOR ZV=1 TO VZ
2350 CALL VCHAR(X+ZV,IV+2,96
+N)
2360 NEXT ZV
2370 AT$="0000"&A$&A$&A$&A$&
A$&A$
2380 CALL CHAR(143+N,AT$)
2390 CALL VCHAR(X,IV+2,143+N
)
2400 AB$=A$&A$&A$&A$&A$&A$
2410 CALL CHAR(151+N,AB$)
2420 CALL HCHAR(X+VZ+1,IV+2,
151+N)
2430 C$=D$(N)&"="&STR$(V(N))
2440 IF LEN(C$)<30 THEN 2490
2450 CALL CLEAR
2460 PRINT "SORRY,-THE COMBI
NATION OF A LONG LABEL,AND L
ARGE VALUE  WILL BE TOO LONG
 TO PRINT ONTHE SCREEN."
2470 PRINT "CAN YOU GO BACK
TO THE STARTAND ABREVIATE TH
E LABELS    AND/OR THE VALUE
S?"
2480 GOTO 880
2490 X=X+1
2500 GOSUB 4020
2510 NEXT N
2520 GOTO 2050
2530 CALL CLEAR
2540 FOR NN=1 TO B-1
2550 FOR N=1 TO B-1
2560 IF VV(N)>=VV(N+1)THEN 2
710
2570 TT=VV(N)
2580 T=V(N)
2590 T$=D$(N)
2600 TC=CC(N)
2610 VV(N)=VV(N+1)
2620 V(N)=V(N+1)
2630 D$(N)=D$(N+1)
2640 CC(N)=CC(N+1)
2650 CC(N+1)=TC
2660 CALL COLOR(8+N,CC(N),1)
2670 CALL COLOR(9+N,CC(N+1),
1)
2680 VV(N+1)=TT
2690 V(N+1)=T
2700 D$(N+1)=T$
2710 NEXT N
2720 NEXT NN
2730 C$=G$
2740 Y=2
2750 X=21
2760 GOSUB 3930
2770 FOR N=1 TO B
2780 X=5*N-4
2790 CALL HCHAR(X,20,88+8*N)
2800 C$=D$(N)
2810 YY=21
2820 Y=21
2830 GOSUB 4090
2840 C$="="&STR$(V(N))
2850 X=X+1
2860 Y=21
2870 GOSUB 4090
2880 NEXT N
2890 IF L<=196 THEN 2950
2900 FOR N=1 TO B
2910 VV(N)=VV(N)/1.4
2920 NEXT N
2930 L=L/1.4
2940 GOTO 2890
2950 IF L>=121 THEN 3010
2960 FOR N=1 TO B
2970 VV(N)=VV(N)*1.4
2980 NEXT N
2990 L=L*1.4
3000 GOTO 2890
3010 SR=SQR(L)
3020 SC=SQR(L)+1
3030 FOR N=1 TO B
3040 LS=SQR(VV(N))
3050 FOR RW=SR+N TO (SR+N-LS
+1)STEP -1
3060 CALL HCHAR(RW,SC-LS+N,8
8+8*N,LS)
3070 NEXT RW
3080 NEXT N
3090 GOTO 2050
3100 CALL CLEAR
3110 TV=V(1)+V(2)+V(3)+V(4)+
V(5)+V(6)
3120 FOR N=96 TO 136 STEP 8
3130 FOR NN=0 TO 7
3140 READ A$
3150 CALL CHAR(N+NN,A$)
3160 NEXT NN
3170 RESTORE 3190
3180 NEXT N
3190 DATA 0103070F1F3F7F8,FF
FFFFFFFFFFFF,FEFDFBF7EFDFBF7
F,FFFFFFFFFFFFFFFF,FEFEFEFEF
EFEFEFE
3200 DATA FFFFFFFFFFFFFFFF,F
EFEFEFEFEFEFEFE,FFFEFCF8F0E0
C08
3210 C$=G$
3220 X=1
3230 Y=2
3240 GOSUB 3930
3250 C$="*ROUNDED TO NEAREST
 %"
3260 X=X+1
3270 Y=2
3280 GOSUB 3930
3290 IF L<=20 THEN 3350
3300 FOR N=1 TO B
3310 VV(N)=INT(VV(N)/1.4)
3320 NEXT N
3330 L=L/1.4
3340 GOTO 3290
3350 IF L>=15 THEN 3410
3360 FOR N=1 TO B
3370 VV(N)=INT(VV(N)*1.3)
3380 NEXT N
3390 L=L*1.3
3400 GOTO 3290
3410 FOR N=1 TO B
3420 CALL HCHAR(3+3*N,21,89+
8*N)
3430 X=3+3*N
3440 Y=22
3450 C$=D$(N)
3460 YY=22
3470 GOSUB 4090
3480 HT=25-VV(N)
3490 CO=3*N-6*(B<4)
3500 IF V(N)=0 THEN 3660
3510 IF VV(N)=0 THEN 3550
3520 CALL VCHAR(HT,CO,92+8*N
,VV(N))
3530 CALL VCHAR(HT,CO+1,91+8
*N,VV(N))
3540 CALL VCHAR(HT,CO-1,91+8
*N,VV(N))
3550 CALL HCHAR(HT-1,CO,89+8
*N)
3560 CALL HCHAR(HT-1,CO+1,90
+8*N)
3570 CALL HCHAR(HT-1,CO-1,88
+8*N)
3580 IF VV(N)=0 THEN 3620
3590 CALL HCHAR(24,CO,94+8*N
)
3600 CALL HCHAR(24,CO+1,95+8
*N)
3610 CALL HCHAR(24,CO-1,93+8
*N)
3620 C$=STR$(INT((V(N)/TV)*1
00+.5))&"%"
3630 Y=CO
3640 X=HT+2+(HT>17)*6
3650 GOSUB 4300
3660 NEXT N
3670 GOTO 2050
3680 CALL CLEAR
3690 PRINT "**AT THE INSTRUC
TION.         FIND THE NEXT
UNUSED PART   OF THE TAPE TH
EN-ENTER"
3700 OPEN #2:"CS1",INTERNAL,
OUTPUT,FIXED 192
3710 PRINT #2:G$,L,B,C,CL,K,
S
3720 FOR N=1 TO B
3730 PRINT #2:V(N),VV(N),CC(
N),D$(N)
3740 NEXT N
3750 CLOSE #2
3760 CALL CLEAR
3770 PRINT : : : :"DATA TRAN
FERED"
3780 FOR N=1 TO 100
3790 NEXT N
3800 GOTO 190
3810 PRINT "3__MID.GREEN  4_
_L.GREEN": :"5__D.BLUE     6
__L.BLUE": :"7__D.RED      8
__CYAN": :
3820 PRINT "9__MID.RED    10
_L.RED": :"11_D.YELLOW   12_
L.YELLOW": :"13_D.GREEN    1
4_PURPLE": :"15_GREY": : :
3830 RETURN
3840 CALL CLEAR
3850 FOR F=1 TO 8
3860 CALL COLOR(F,1,1)
3870 NEXT F
3880 RETURN
3890 FOR F=1 TO 8
3900 CALL COLOR(F,16,1)
3910 NEXT F
3920 RETURN
3930 FOR Z=1 TO LEN(C$)
3940 IF Y<32 THEN 3970
3950 Y=2
3960 X=X+1
3970 CX=ASC(SEG$(C$,Z,1))
3980 CALL HCHAR(X,Y,CX)
3990 Y=Y+1
4000 NEXT Z
4010 RETURN
4020 Y=4
4030 FOR Z=1 TO LEN(C$)
4040 CX=ASC(SEG$(C$,Z,1))
4050 CALL HCHAR(X,Y,CX)
```

```
4060 Y=Y+1
4070 NEXT Z
4080 RETURN
4090 FOR Z=1 TO LEN(C$)
4100 IF Y>=YY THEN 4130
4110 Y=YY
4120 X=X+1
4130 IF Y<32 THEN 4160
4140 Y=YY
4150 X=X+1
4160 CX=ASC(SEG$(C$,Z,CX))
4170 CALL HCHAR(X,Y,CX)
4180 Y=Y+1
4190 NEXT Z
4200 RETURN
4210 SS=SS+2*S
4220 C$=STR$(SS)
4230 Y=7-LEN(C$)
4240 FOR Z=1 TO LEN(C$)
4250 CX=ASC(SEG$(C$,Z,1))
4260 CALL HCHAR(X-1,Y,CX)
4270 Y=Y+1
4280 NEXT Z
4290 RETURN
4300 FOR Z=1 TO LEN(C$)
4310 CX=ASC(SEG$(C$,Z,1))
4320 CALL VCHAR(X,Y,CX)
4330 X=X+1
4340 NEXT Z
4350 RETURN
4360 PRINT :"PRESS <FCTN+8>
TO REDO TEXT"
4370 ZK=0
4380 CALL HCHAR(11,2,45,ML)
4390 Z$=""
4400 Y=2
4410 CALL HCHAR(X,Y,95)
4420 CALL KEY(3,ZK,S)
4430 CALL HCHAR(X,Y,32)
4440 IF S=0 THEN 4410
4450 IF (ZK=13)+(ZK=6)THEN 4
570
4460 CALL HCHAR(X,Y,ZK)
4470 Z$=Z$&CHR$(ZK)
4480 IF LEN(Z$)<MT THEN 4530
4490 CALL SOUND(250,110,0,-4
,12)
4500 PRINT :"*MAXIMUM LEN6TH
,PRESS <REDO>TO START TEXT A
GAIN": :"*OR <ENTER> IF TEXT
 IS OK"
4510 CALL KEY(0,ZK,S)
4520 IF (ZK<>6)*(ZK<>13)THEN
 4510 ELSE 4570
4530 Y=Y+1
4540 IF Y<LM THEN 4410
4550 X=X+1
4560 GOTO 4400
4570 RETURN
4580 END
```

```
100 !**********************
110 !*  TELEPHONE TIMER   *
120 !*(C)CLIVE TUCKER 1985*
130 !**********************
140 REM
150 REM
160 OPTION BASE 1
170 DATA 9780,8:00,2440,2:00
,1825,1:30,2440,2:00,910,0:4
5,600,0:30,1215,1:00,475,0:2
4,360,0:18
180 GOTO 210 :: EX,I,CDE,CDE
$,RTE,RTE$,CST,TME,C,CHC,K,S
,MEN :: DIM PRD(3,5),PRD$(3,
5)
190 CALL CLEAR :: CALL SCREE
N :: CALL COLOR :: CALL CHAR
 :: CALL MAGNIFY :: CALL KEY
 :: CALL SOUND :: CALL HCHAR
 :: CALL VCHAR :: CALL SPRIT
E :: CALL PATTERN :: CALL DE
LSPRITE
200 !@P-
210 CALL CLEAR :: CALL SCREE
N(7):: FOR I=1 TO 8 :: CALL
COLOR(I,16,1):: NEXT I
220 CALL CHAR(97,RPT$("55AA"
,4),35,RPT$("55AA",4),33,"3C
4299A1A199423C")
230 DISPLAY AT(1,1):" #####
#### #    ####":"   #   #
 #    #":"   #   ### #    #
##  ##":"   #   #    #    #"
:"   #   #### #### ####": :
240 DISPLAY AT(8,1):"  ####
#  # #### #   # ####":"  #
# #  # #  # ##  # #":"  ####
 #### #  # # # # ###":"  #
  #  # #  # #  ## #"
250 DISPLAY AT(12,1):"  #
 #  # #### #   # ####": : :
:
260 DISPLAY AT(15,1):" #####
 # #   # #### ####":"   #
# ## ## #    #  #":"   #   #
 # # # ###  ####":"   #   #
#   # #    # #":"   #   # #
  # #### #  #": :
270 DISPLAY AT(21,1):"
   ! CLIVE TUCKER 1985": : :
280 DISPLAY AT(24,1):"INITIA
LISING...PLEASE WAIT"
290 DATA 970,0:48,400,0:20,3
00,0:15,300,0:15,155,0:08,15
5,0:08
300 FOR CDE=1 TO 5 :: FOR RT
E=1 TO 3 :: READ PRD(RTE,CDE
),PRD$(RTE,CDE):: NEXT RTE :
: NEXT CDE :: MEN=0 :: CST=1
0000
310 CALL CHAR(36,"0018247020
70207C",96,RPT$("0",12)&"181
8"):: CALL MAGNIFY(2):: CALL
 COLOR(9,10,1)
320 CALL CHAR(98,"0000001F1F
181818",99,"000000FFFF",100,
"000000F8F8181818",101,RPT$(
"18",8),102,"181818F8F8",103
,"1818181F1F"):: CALL SOUND(
200,1400,0)
330 DISPLAY AT(24,1):"EXPANS
ION MEMORY?(Y/N)" :: CALL KE
Y(0,K,S):: IF K<>89 AND K<>7
8 THEN 330 ELSE CALL SOUND(2
00,1400,0):: IF K=78 THEN EX
=1.0588 ELSE EX=1
340 DISPLAY AT(24,1):"WANT I
NSTRUCTIONS?(Y/N)" :: CALL K
EY(0,K,S):: IF K<>89 AND K<>
78 THEN 340 :: IF K=89 THEN
GOSUB 940
350 GOSUB 670
360 GOSUB 790
370 TME=INT(PRD(RTE,CDE)/EX)
380 IF MEN=0 THEN GOSUB 480
:: MEN=1
390 CALL KEY(0,K,S):: IF S=0
 THEN 390
400 CST=CST+5.405 :: GOSUB 6
50
410 C=1 :: CALL SOUND(100,66
0,0)
420 C=C+1
430 CALL KEY(0,K,S):: IF S>0
 THEN CALL SOUND(100,440,0):
: GOSUB 1090 :: GOTO 370440
IF C>TME THEN CST=CST+5.405
ELSE 420
450 GOSUB 650 :: GOTO 410
460 !**********************
470 !SUB DISPLAY
480 CALL CLEAR :: CALL SCREE
N(2):: CALL DELSPRITE(ALL)
490 CALL HCHAR(2,2,98):: CAL
L HCHAR(2,3,99,8):: CALL HCH
AR(2,11,100):: CALL HCHAR(3,
11,101):: CALL HCHAR(4,11,10
2):: CALL HCHAR(4,3,99,8)
500 CALL HCHAR(4,2,103):: CA
LL HCHAR(3,2,101)
510 DISPLAY AT(1,1):"CHARGE
RATE" :: DISPLAY AT(3,1)SIZE
(8):RTE$
520 CALL HCHAR(7,2,98):: CAL
L HCHAR(7,3,99,2):: CALL HCH
AR(7,5,100):: CALL HCHAR(8,5
,101):: CALL HCHAR(9,5,102):
: CALL HCHAR(9,3,99,2)
530 CALL HCHAR(9,2,103):: CA
LL HCHAR(8,2,101)
540 DISPLAY AT(6,1):"CHARGE
CODE" :: DISPLAY AT(8,1)SIZE
(2):CDE$
550 CALL HCHAR(12,2,98):: CA
LL HCHAR(12,3,99,4):: CALL H
CHAR(12,7,100):: CALL HCHAR(
13,7,101):: CALL HCHAR(14,7,
102):: CALL HCHAR(14,3,99,4)
560 CALL HCHAR(14,2,103):: C
ALL HCHAR(13,2,101)
570 DISPLAY AT(11,1):"UNIT P
ERIOD" :: DISPLAY AT(13,1)SI
ZE(4):PRD$(RTE,CDE)
580 FOR I=0 TO 1 :: CALL HCH
AR(19+I*5,2,97,11):: CALL VC
HAR(20,2+I*10,97,4):: NEXT I
590 CALL HCHAR(16,11,98):: C
ALL HCHAR(16,12,99):: CALL H
CHAR(16,13,100):: CALL HCHAR
(17,13,101):: CALL HCHAR(18,
13,102):: CALL HCHAR(18,12,9
9)
600 CALL HCHAR(18,11,103)::
CALL HCHAR(17,11,101):: DISP
LAY AT(16,1)SIZE(8):"OVERFLO
W" :: DISPLAY AT(17,10)SIZE(
1):SEG$(STR$(CST),2,1)
610 DISPLAY AT(17,5)SIZE(4):
"X$10"
620 FOR I=3 TO 5 :: CALL SPR
ITE(#I,ASC(SEG$(STR$(CST),I,
1)),11,160,-(148/(I-1)-108))
:: NEXT I :: CALL SPRITE(#1,
36,10,160,20):: CALL HCHAR(2
2,7,96)
630 RETURN
640 !SUB UPDATE
650 FOR I=3 TO 5 :: CALL PAT
TERN(#I,ASC(SEG$(STR$(CST),I
,1))):: NEXT I :: DISPLAY AT
(17,10)SIZE(1):SEG$(STR$(CST
),2,1)
660 RETURN
670 !SUB RATEMENU
680 CALL CLEAR :: CALL SCREE
N(5)
690 DISPLAY AT(1,9):"RATE ME
NU" :: DISPLAY AT(2,9):"XXXX
XXXXX"
700 DISPLAY AT(4,1):"1=CHEAP
 (6PM-8AM & WEEKENDS)" :: DI
SPLAY AT(6,1):"2=STANDARD (8
AM-9AM,1PM-6PM)" :: DISPLAY
AT(8,1):"3=PEAK (9AM-1PM)"
710 DISPLAY AT(12,1):"CHOICE
? (1..3)" :: CALL KEY(0,K,S)
:: IF K<49 OR K>51 THEN 710
ELSE RTE=K-48
720 ON RTE GOTO 730,740,750
730 RTE$="CHEAP" :: GOTO 760
740 RTE$="STANDARD" :: GOTO
760
750 RTE$="PEAK"
760 IF MEN=1 THEN GOSUB 480
770 RETURN
780 !SUB CODEMENU
790 CALL CLEAR :: CALL SCREE
N(14)
800 DISPLAY AT(1,9):"CODE ME
NU" :: DISPLAY AT(2,9):"XXXX
XXXXX"
```

```
810 DISPLAY AT(4,1):"1=L  (L
OCAL)" :: DISPLAY AT(6,1):"2
=A (UP TO 56KM)"
820 DISPLAY AT(8,1):"3=B1 (O
VER 56KM (LOW COST))" :: DIS
PLAY AT(10,1):"4=B (OVER 56K
M)"
830 DISPLAY AT(11,6):"AND CH
ANNEL ISLANDS)" :: DISPLAY A
T(13,1):"5=I (IRISH REPUBLIC
)"
840 DISPLAY AT(17,1):"CHOICE
? (1..5)" :: CALL KEY(3,K,S)
:: IF K<49 OR K>53 THEN 840
ELSE CDE=K-48
850 ON CDE GOTO 860,870,880,
890,900
860 CDE$="L" :: GOTO 910
870 CDE$="A" :: GOTO 910
880 CDE$="B1" :: GOTO 910
890 CDE$="B" :: GOTO 910
900 CDE$="I"
910 IF MEN=1 THEN GOSUB 480
920 RETURN
930 !SUB INSTRUCT
940 CALL CLEAR :: CALL SCREE
N(13)
950 DISPLAY AT(1,10):"INSTRU
CTIONS" :: DISPLAY AT(2,10):
"XXXXXXXXXXXX"
960 DISPLAY AT(4,1):"1. DETE
RMINE CHARGE CODE OF    CALL
(S) TO BE MADE          (SEE
 YOUR LOCAL ""DIALLING   COD
ES"" BOOKLET)."
970 DISPLAY AT(9,1):"2. SELE
CT REQUIRED RATE AND    CODE
 FROM MENUS THAT        FOLL
OW."
980 DISPLAY AT(13,1):"3. DIA
L REQUIRED NUMBER." :: DISPL
AY AT(15,1):"4. PRESS ANY KE
Y TO START      TIMER- REPEA
T TO STOP."
990 DISPLAY AT(18,1):"5. WHE
N CALL HAS ENDED, STOP   TIM
ER. MAIN MENU WILL       THE
N BE SHOWN."
1000 DISPLAY AT(24,1):"PRESS
 ANY KEY TO CONTINUE..."
1010 CALL KEY(0,K,S):: IF S=
0 THEN 1010
1020 CALL CLEAR :: DISPLAY A
T(1,4):"INSTRUCTIONS (CONT'D
)" :: DISPLAY AT(2,4):"XXXXX
XXXXXXXXXXXXXX"
1030 DISPLAY AT(4,1):"6. SEL
ECT REQUIRED OPTIONS    FROM
 MAIN MENU. PRESS       'ENT
ER' TO INITIALISE       TIME
R FOR FURTHER CALLS."
1040 DISPLAY AT(24,1):"PRESS
 ANY KEY TO CONTINUE..."
1050 CALL KEY(0,K,S):: IF S=
0 THEN 1050
1060 IF MEN=1 THEN GOSUB 480
1070 RETURN
1080 !SUB MAINMENU
1090 CALL HCHAR(1,14,98):: C
ALL HCHAR(1,15,99,16):: CALL
 HCHAR(1,31,100):: CALL VCHA
R(2,31,101,22):: CALL HCHAR(
24,31,102)
1100 CALL HCHAR(24,15,99,16)
:: CALL HCHAR(24,14,103):: C
ALL VCHAR(2,14,101,22)
1110 DISPLAY AT(2,16)SIZE(9)
:"MAIN MENU"
1120 DISPLAY AT(4,13)SIZE(13
):"1=CHANGE RATE" :: DISPLAY
 AT(6,13)SIZE(13):"2=CHANGE
CODE" :: DISPLAY AT(8,13)SIZ
E(12):"3=RESET COST"
1130 DISPLAY AT(10,13)SIZE(1
4):"4=EXIT TO O.S." :: DISPL
AY AT(12,13)SIZE(14):"5=INST
RUCTIONS"
1140 DISPLAY AT(19,14)SIZE(1
3):"ANY OTHER KEY" :: DISPLA
Y AT(20,14)SIZE(14):"RESETS
TIMER"
1150 DISPLAY AT(23,17)SIZE(9
):"CHOICE?" :: CALL KEY(3,K,
S):: IF S=0 THEN 1150 :: IF
K<49 OR K>53 THEN 1220 ELSE
CHC=K-48
1160 ON CHC GOTO 1170,1180,1
190,1200,1210
1170 CALL DELSPRITE(ALL):: G
OSUB 680 :: GOTO 1090
1180 CALL DELSPRITE(ALL):: G
OSUB 790 :: GOTO 1090
1190 CST=10000 :: GOSUB 650
:: GOTO 1150
1200 CALL CLEAR :: STOP
1210 CALL DELSPRITE(ALL):: G
OSUB 940 :: GOTO 1090
1220 FOR I=14 TO 32 :: CALL
VCHAR(1,I,32,24):: NEXT I
1230 RETURN
```

```
100 REM ********************
**
110 REM ********************
**
120 REM **
**
130 REM **
**
140 REM **    S O N A R
**
150 REM **
**
160 REM **
**
170 REM **
**
180 REM **
**
190 REM **  BY ALAN JONES
**
200 REM **
**
210 REM **
**
220 REM ********************
**
230 REM ********************
**
240 CALL CLEAR :: CALL SCREE
N(12)
250 DISPLAY AT(8,11):"S O N
A R"
260 DISPLAY AT(16,8):"By: AL
AN JONES"
270 CALL MUSIC
280 FOR DELAY=1 TO 500 :: NE
XT DELAY
290 CALL MUSIC2
300 CALL CLEAR
310 DISPLAY AT(8,2):"PICK A
REMOTE CONTROLLER &"
320 DISPLAY AT(11,2):"PRESS
THE FIRE BUTTON"
330 CALL KEY(1,K,S):: CALL K
EY(2,K2,S2):: IF S=0 AND S2=
0 THEN 330
340 IF S=0 THEN JS=2 ELSE JS
=1
350 DISPLAY AT(15,8):"GOOD!"
360 DISPLAY AT(18,2):"HAVE T
HE ALPHA LOCK UP"
370 DISPLAY AT(23,2):"PRESS
Y FOR INSTRUCTIONS"
380 DISPLAY AT(24,2):"OR ANY
 OTHER KEY TO START"
390 CALL KEY(0,K,S):: IF K=8
9 OR K=121 THEN CALL RULES(J
S)ELSE CALL KEY(JS,K,S2)
400 IF S=0 AND S2=0 THEN 390
410 DATA 196,2,262,4,262,4,2
62,1,294,1,330,1,349,1,392,2
,262,2,294,6,330,1,349,1,330
,20
420 DATA 392,4,349,4,330,1,2
62,1,349,1,294,1,392,2,349,2
,330,4,294,4,262,20
430 DATA THE SUBMARINE WILL
DIVE.,YOU MUST FIND IT USING
,YOUR SONAR AS QUICKLY,AS PO
SSIBLE.,,SHOOT WHEN YOU ARE
WITHIN
440 DATA 5 METRES.,,PRESS FI
RE BUTTON.....
450 CALL CLEAR
460 FOR X=1 TO 12 :: CALL CO
LOR(X,12,6):: NEXT X
470 BEST=9999E99
480 RANDOMIZE
490 CALL SCREEN(6)
500 DATA 0101010101030303033
F7FFF7F3F00008000004040C0C0C
0C0FCFEFFFEFC0000
510 DATA 0001010101010303030
33F7FFF7F0000008000004040C0C
0C0C0FCFEFFFE0000
520 DATA 0000010101010103030
3033F7FFF000000008000004040C
0C0C0C0FCFEFF0000
530 DATA 0000000101010101030
303033F7F000000000800000404
0C0C0C0C0FCFE
540 DATA 0000000001010101010
30303033F000000000008000004
040C0C0C0C0FC
550 DATA 0000000000010101010
10303030300000000000080000
04040C0C0C0C0
560 DATA 0000000000000101010
10103030300000000000000800
0004040C0C0C
570 DATA 0000000000000001010
10101030300000000000000008
000004040C0C0
580 DATA 0000000000000000010
10101010300000000000000000
08000004040C0
590 DATA 0000000000000000000
10101010100000000000000000
0008000004040
600 DATA 0000000000000000000
00101010100000000000000000
0000080000040
610 DATA 0000000000000000000
00001010100000000000000000
00000008
620 DATA 0000000000000000000
00000101000000000000000000
0000000008
630 DATA 0000000000000000000
00000001000000000000000000
000000000008
640 DATA 0000000000000000000
00000000000000000000000000
00000000000000000
650 DIM P$(15)
660 CALL CHAR(132,"FFFFFFFFF
FFFFFFF"):: CALL HCHAR(21,1,
132,128)
670 CALL HCHAR(1,1,132,32)::
 CALL VCHAR(1,1,132,48):: CA
LL VCHAR(1,31,132,48)
680 CALL CHAR(133,"010001000
1000100",134,"11")
690 FOR X=1 TO 4 :: CALL VCH
AR(2,6*X+2,133,19):: NEXT X
700 FOR X=1 TO 3 :: CALL HCH
AR(X*6-2,3,134,28):: NEXT X
710 DISPLAY AT(1,11)SIZE(7):
" SONAR "
720 RESTORE 500
730 FOR X=1 TO 15
```

```
740 READ P$(X)
750 NEXT X
760 CALL CHAR(128,P$(1))
770 CALL MAGNIFY(3)
780 CALL SPRITE(#1,128,2,20,
20,1,3)
790 CALL MUSIC
800 FOR J=1 TO 1700 :: NEXT
J
810 FOR Z=1 TO 30 :: CALL SO
UND(1,6000,0):: NEXT Z
820 FOR X=1 TO 3
830 DISPLAY AT(8,20)SIZE(4):
"DIVE" :: FOR Y=1 TO 50 :: N
EXT Y :: DISPLAY AT(8,20)SIZ
E(4):"    " :: FOR Y=1 TO 25
 :: NEXT Y :: NEXT X
840 FOR X=1 TO 15
850 CALL CHAR(128,P$(X))
860 FOR J=1 TO 50 :: NEXT J
870 NEXT X
880 CALL COLOR(#1,1):: CALL
CHAR(128,P$(1))
890 CALL HCHAR(21,1,132,128)
900 R=INT(RND*150)+1 :: C=IN
T(RND*240)+1
910 R2=INT(RND*150)+1 :: C2=
INT(RND*240)+1
920 IF ABS(R2-R)<80 AND ABS(
C2-C)<80 THEN 900
930 CALL LOCATE(#1,R,C)
940 CALL MAGNIFY(2)
950 CALL SPRITE(#2,43,16,R2,
C2)
960 REM **  MAIN LOOP  **
970 V=INT(RND*3)-1 :: H=INT(
RND*3)-1
980 FOR Q=1 TO 75
990 CALL JOYST(JS,A,B)
1000 R2=R2-B :: C2=C2+A
1010 IF R2<5 THEN R2=5
1020 IF R2>146 THEN R2=146
1030 IF C2<16 THEN C2=16
1040 IF C2>228 THEN C2=228
1050 CALL LOCATE(#2,R2,C2)
1060 T=T+1
1070 R=R+V :: C=C+H
1080 IF R<5 THEN R=5
1090 IF R>146 THEN R=146
1100 IF C<16 THEN C=16
1110 IF C>228 THEN C=228
1120 CALL LOCATE(#1,R,C)
1130 CALL DISTANCE(#1,#2,E)
1140 DISPLAY AT(22,1):USING
"    RANGE = ### METRES":SQR
(E)
1150 CALL SOUND(1,(44000-E)/
11,0)
1160 CALL KEY(JS,K,S):: IF S
=0 THEN 1170 ELSE SHOT=SHOT+
1 :: IF E<30 THEN 1190
1170 NEXT Q
1180 GOTO 960
1190 CALL MOTION(#1,0,0)
1200 CALL DELSPRITE(#2)
1210 CALL MAGNIFY(3)
1220 FOR X=1 TO 20
1230 CALL COLOR(#1,2):: CALL
 SOUND(20,-8,0):: CALL COLOR
(#1,16):: CALL SOUND(20,-7,0
)
1240 NEXT X
1250 DISPLAY AT(22,1):USING
"HIT IN #### SECONDS":T
1260 CALL MUSIC2
1270 IF T>=BEST THEN CALL NO
TBEST(BEST,T,NAME$)
1280 IF T<BEST THEN BEST=T :
: CALL BEST(BEST,T,NAME$)
1290 T=0
1300 GOTO 760
1310 SUB BEST(BEST,T,NAME$)
1320 DISPLAY AT(24,1):"ENTER
 YOUR NAME" :: ACCEPT AT(24,
16):NAME$
1330 DISPLAY AT(23,1):"BEST
TIME IS ";BEST;" SECONDS"
1340 DISPLAY AT(24,1):"BY :
 ";NAME$
1350 SUBEND
1360 SUB MUSIC
1370 RESTORE 410
1380 FOR X=1 TO 13
1390 READ FRE,DUR
1400 CALL SOUND(DUR*70,FRE,0
,FRE*2,0,FRE*3,0)
1410 NEXT X
1420 SUBEND
1430 SUB MUSIC2
1440 RESTORE 420
1450 FOR X=1 TO 11
1460 READ FRE,DUR
1470 CALL SOUND(DUR*85,FRE,0
,FRE*2,0,FRE*4,0)
1480 NEXT X
1490 SUBEND
1500 SUB RULES(JS)
1510 CALL CLEAR
1520 RESTORE 430
1530 FOR X=1 TO 9
1540 READ LINE$
1550 DISPLAY AT(X+7,1):LINE$
1560 NEXT X
1570 CALL KEY(JS,K,S):: IF S
=0 THEN 1570
1580 SUBEND
1590 SUB NOTBEST(BEST,T,NAME
$)
1600 DISPLAY AT(23,1):"BEST
TIME IS STILL";BEST;"SECS"
1610 DISPLAY AT(24,1):"BY :
 ";NAME$
1620 SUBEND
```

TREASURES OF XEROX

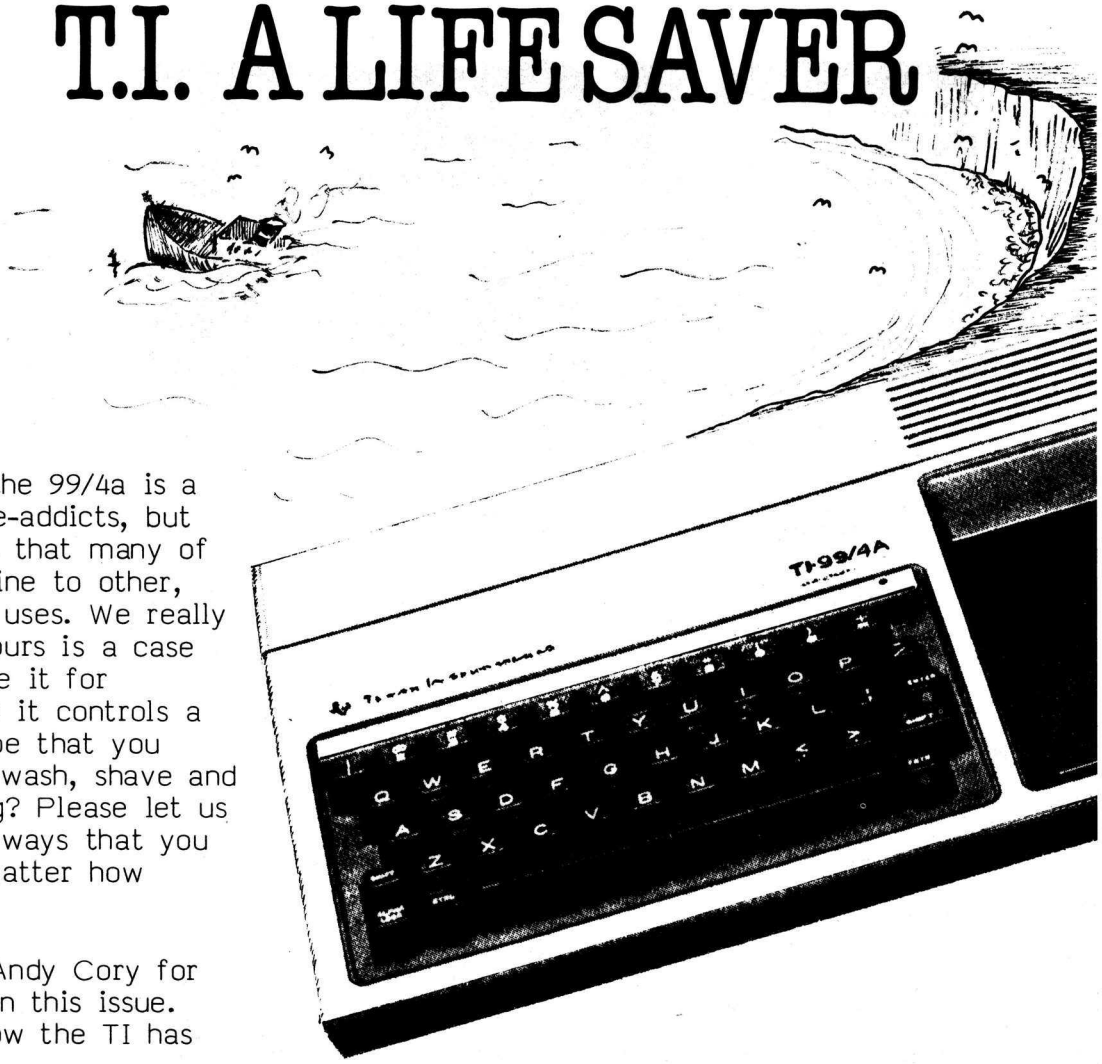
```
100 DIM YY(25)
110 YY(3)=24
120 YY(8)=10
130 YY(13)=7
140 YY(18)=19
150 YY(23)=12
160 CALL CHAR(33,"")
170 HSC=0
180 SC=0
190 BON=0
200 CALL CLEAR
210 SCREEN=1
220 LIV=5
230 CALL CHAR(136,"FF7E3C181
83C7EFF")
240 CALL COLOR(14,3,1)
250 CHH=0
260 CALL COLOR(3,14,1)
270 CALL COLOR(4,14,1)
280 X=23
290 Y=18
300 CALL COLOR(5,13,1)
310 CALL COLOR(6,13,1)
320 CALL COLOR(7,13,1)
330 CALL COLOR(8,13,1)
340 CALL CHAR(128,"FF7E3C181
83C7EFF")
350 CALL COLOR(13,9,1)
360 CALL CHAR(144,"C3FFC3FFC
3FFC3FF")
370 CALL COLOR(15,2,1)
380 CALL CHAR(152,"EEEE7777"
)
390 CALL COLOR(16,6,1)
400 CALL CHAR(40,"0C1A34E8E8
341A0C")
410 CALL CHAR(41,"00003FC0C0
3F")
420 CALL CHAR(42,"30582C1717
2C5830")
430 CALL CHAR(43,"0000FC0303
FC0000")
440 CALL COLOR(2,14,1)
450 CALL SCREEN(16)
460 CALL CHAR(120,"003C7EDBF
F5A2418")
470 CALL COLOR(12,11,1)
480 CALL CHAR(112,"181818181
8181818")
490 GOSUB 5500
500 CALL COLOR(11,7,1)
510 CALL COLOR(10,12,1)
520 FOR I=3 TO 23 STEP 5
530 CALL HCHAR(I,YY(I),112)
540 NEXT I
550 CALL CHAR(110,"99DBFFFFF
FFFFFFF")
560 CALL HCHAR(3,26,110)
570 CALL HCHAR(4,3,152,29)
580 CALL HCHAR(9,3,152,29)
590 CALL HCHAR(14,3,152,29)
600 CALL HCHAR(19,3,152,29)
610 CALL HCHAR(24,3,152,29)
620 CALL VCHAR(4,8,144,4)
630 CALL VCHAR(4,12,144,4)
640 CALL VCHAR(4,16,144,4)
650 CALL VCHAR(4,20,144,4)
660 CALL VCHAR(4,24,144,4)
670 CALL VCHAR(9,5,144,4)
680 CALL VCHAR(9,10,144,4)
690 CALL VCHAR(9,16,144,4)
700 CALL VCHAR(9,22,144,4)
710 CALL VCHAR(9,27,144,4)
720 CALL VCHAR(14,7,144,4)
730 CALL VCHAR(14,12,144,4)
740 CALL VCHAR(14,16,144,4)
750 CALL VCHAR(14,20,144,4)
760 CALL VCHAR(14,25,144,4)
770 CALL VCHAR(19,5,144,4)
780 CALL VCHAR(19,13,144,4)
790 CALL VCHAR(19,16,144,4)
800 CALL VCHAR(19,19,144,4)
810 CALL VCHAR(19,27,144,4)
820 FOR L=3 TO 9
830 READ G
840 CALL HCHAR(1,L,G)
850 NEXT L
860 DATA 83,67,82,69,69,78,6
1
870 FOR L=12 TO 17
880 READ G
890 CALL HCHAR(1,L,G)
900 NEXT L
910 DATA 83,67,79,82,69,61
920 FOR L=23 TO 28
930 READ G
940 CALL HCHAR(1,L,G)
950 NEXT L
960 DATA 66,79,78,85,83,61
970 FOR L=6 TO 14
980 READ G
990 CALL HCHAR(2,L,G)
1000 NEXT L
1010 DATA 72,73,45,83,67,79,
82,69,61
1020 FOR L=22 TO 27
1030 READ G
1040 CALL HCHAR(2,L,G)
1050 NEXT L
1060 DATA 76,73,86,69,83,61
1070 LIV$=STR$(LIV)
1080 FOR K=1 TO LEN(LIV$)
1090 CALL HCHAR(2,27+K,ASC(S
EG$(LIV$,K,1)))
1100 NEXT K
```

```
1110 HSC$=STR$(HSC)
1120 FOR K=1 TO LEN(HSC$)
1130 CALL HCHAR(2,14+K,ASC(S
EG$(HSC$,K,1)))
1140 NEXT K
1150 CALL HCHAR(3,3,40)
1160 CALL HCHAR(3,31,42)
1170 CALL HCHAR(8,3,40)
1180 CALL HCHAR(8,31,42)
1190 CALL HCHAR(13,3,40)
1200 CALL HCHAR(13,31,42)
1210 CALL HCHAR(18,3,40)
1220 CALL HCHAR(18,31,42)
1230 CALL HCHAR(23,3,40)
1240 CALL HCHAR(23,31,42)
1250 CALL HCHAR(8,16,32)
1260 CALL HCHAR(13,16,32)
1270 CALL HCHAR(18,16,32)
1280 GOTO 5050
1290 CALL HCHAR(23,16,32)
1300 CALL HCHAR(X,Y,32)
1310 CALL HCHAR(A,B,32)
1320 CALL HCHAR(C,D,32)
1330 X=23
1340 Y=18
1350 CALL HCHAR(A,B,120)
1360 CALL HCHAR(C,D,120)
1370 CALL HCHAR(X,Y,128)
1380 CALL HCHAR(3,26,110)
1390 FOR QQ=1 TO 3
1400 CALL SOUND(285,-3,0)
1410 FOR Q=1 TO 30
1420 NEXT Q
1430 NEXT QQ
1440 GOTO 3750
1450 CALL GCHAR(X,YY(X),RR)
1460 IF (RR<>33)*(RR<>128)*(
RR<>136)THEN 1490
1470 T=20
1480 GOTO 1500
1490 T=0
1500 CALL KEY(0,K,S)
1510 IF S=0 THEN 1620
1520 IF K<>J1 THEN 1620
1530 IF Y=4 THEN 1620
1540 IF (X=A)*(Y=B)=1 THEN 3
900
1550 IF (X=C)*(Y=D)=1 THEN 3
900
1560 CALL HCHAR(X,Y,33)
1570 Y=Y-1
1580 IF T=20 THEN 1590 ELSE
1610
1590 CALL HCHAR(X,Y,136)
1600 GOTO 1620
1610 CALL HCHAR(X,Y,128)
1620 RETURN
1630 CALL KEY(0,K,S)
1640 IF S=0 THEN 1760
1650 IF K<>J2 THEN 1760
1660 IF Y=30 THEN 1760
1670 IF (X=A)*(Y=B)=1 THEN 3
900
1680 IF (X=C)*(Y=D)=1 THEN 3
900
1690 CALL HCHAR(X,Y,33)
1700 Y=Y+1
1710 IF T=20 THEN 1720 ELSE
1740
1720 CALL HCHAR(X,Y,136)
1730 GOTO 1760
1740 CALL HCHAR(X,Y,128)
1750 IF (X=3)*(Y=26)=1 THEN
4300
1760 RETURN
1770 CALL KEY(0,K,S)
1780 IF S=0 THEN 1960
1790 IF K<>J3 THEN 1960
1800 CALL GCHAR(X-1,Y,Q)
1810 IF Q<>144 THEN 1960
1820 CALL GCHAR(X,Y,P)
1830 IF P=128 THEN 1970
1840 CALL HCHAR(X,Y,33)
1850 FOR I=1 TO 4
1860 X=X-1
1870 CALL HCHAR(X,Y,136)
1880 CALL SOUND(60,523,0)
1890 CALL HCHAR(X,Y,144)
1900 NEXT I
1910 X=X-1
1920 CALL HCHAR(X,Y,136)
1930 CALL SOUND(60,523,0)
1940 IF (X=A)*(Y=B)=1 THEN 3
900
1950 IF (X=C)*(Y=D)=1 THEN 3
900
1960 SC=SC+20
1970 RETURN
1980 CALL KEY(0,K,S)
1990 IF S=0 THEN 2150
2000 IF K<>J4 THEN 2150
2010 CALL GCHAR(X+1,Y,Q)
2020 IF Q<>144 THEN 2150
2030 CALL HCHAR(X,Y,33)
2040 FOR I=1 TO 4
2050 X=X+1
2060 CALL HCHAR(X,Y,136)
2070 CALL SOUND(60,523,0)
2080 CALL HCHAR(X,Y,144)
2090 NEXT I
2100 X=X+1
2110 CALL HCHAR(X,Y,136)
2120 CALL SOUND(60,523,0)
2130 IF (X=A)*(Y=B)=1 THEN 3
900
2140 IF (X=C)*(Y=D)=1 THEN 3
900
2150 SC=SC-10
2160 RETURN
2170 IF (A=X)*(B=Y)=1 THEN 3
900
2180 IF (C=X)*(D=Y)=1 THEN 3
900
2190 IF A=X THEN 2220
2200 IF A<X THEN 2380
2210 IF A>X THEN 2520
2220 IF B=Y THEN 3900
2230 IF B<Y THEN 2310
2240 IF B=4 THEN 2310
2250 CALL HCHAR(A,B,33)
2260 B=B-1
2270 CALL HCHAR(A,B,120)
2280 CALL SOUND(60,110,0)
2290 IF (A=X)*(B=Y)=1 THEN 3
900
2300 GOTO 2650
2310 IF B=30 THEN 2250
2320 CALL HCHAR(A,B,33)
2330 B=B+1
2340 CALL HCHAR(A,B,120)
2350 CALL SOUND(60,110,0)
2360 IF (A=X)*(B=Y)=1 THEN 3
900
2370 GOTO 2650
2380 CALL GCHAR(A+1,B,Q)
2390 IF Q<>144 THEN 2230
2400 CALL HCHAR(A,B,33)
2410 FOR J=1 TO 4
2420 A=A+1
2430 CALL HCHAR(A,B,120)
2440 CALL SOUND(60,110,0)
2450 CALL HCHAR(A,B,144)
2460 NEXT J
2470 A=A+1
2480 CALL HCHAR(A,B,120)
2490 CALL SOUND(60,110,0)
2500 IF (A=X)*(B=Y)=1 THEN 3
900
2510 GOTO 2650
2520 CALL GCHAR(A-1,B,Q)
2530 IF Q<>144 THEN 2230
2540 CALL HCHAR(A,B,33)
2550 FOR J=1 TO 4
2560 A=A-1
2570 CALL HCHAR(A,B,120)
2580 CALL SOUND(60,110,0)
2590 CALL HCHAR(A,B,144)
2600 NEXT J
2610 A=A-1
2620 CALL HCHAR(A,B,120)
2630 CALL SOUND(60,110,0)
2640 IF (A=X)*(B=Y)=1 THEN 3
900
2650 CHH=1
2660 RETURN
2670 IF (A=X)*(B=Y)=1 THEN 3
900
2680 IF (C=X)*(D=Y)=1 THEN 3
900
2690 IF C=X THEN 2720
2700 IF C<X THEN 2880
2710 IF C>X THEN 3020
2720 IF D=Y THEN 3900
2730 IF D<Y THEN 2810
2740 IF D=4 THEN 2810
2750 CALL HCHAR(C,D,33)
2760 D=D-1
2770 CALL HCHAR(C,D,120)
2780 CALL SOUND(60,110,0)
2790 IF (C=X)*(D=Y)=1 THEN 3
900
2800 GOTO 3150
2810 IF D=30 THEN 3900
2820 CALL HCHAR(C,D,33)
2830 D=D+1
2840 CALL HCHAR(C,D,120)
2850 CALL SOUND(60,110,0)
2860 IF (C=X)*(D=Y)=1 THEN 3
900
2870 GOTO 3150
2880 CALL GCHAR(C+1,D,Q)
2890 IF Q<>144 THEN 2730
2900 CALL HCHAR(C,D,33)
2910 FOR J=1 TO 4
2920 C=C+1
2930 CALL HCHAR(C,D,120)
2940 CALL SOUND(60,110,0)
2950 CALL HCHAR(C,D,144)
2960 NEXT J
2970 C=C+1
2980 CALL HCHAR(C,D,120)
2990 CALL SOUND(60,110,0)
3000 IF (C=X)*(D=Y)=1 THEN 3
900
3010 GOTO 3150
3020 CALL GCHAR(C-1,D,Q)
3030 IF Q<>144 THEN 2730
3040 CALL HCHAR(C,D,33)
3050 FOR J=1 TO 4
3060 C=C-1
3070 CALL HCHAR(C,D,120)
3080 CALL SOUND(60,110,0)
3090 CALL HCHAR(C,D,144)
3100 NEXT J
3110 C=C-1
3120 CALL HCHAR(C,D,120)
3130 CALL SOUND(60,110,0)
3140 IF (C=X)*(D=Y)=1 THEN 3
900
3150 CHH=2
3160 RETURN
3170 IF (A<>X)+(RND<.4)THEN
3740
3180 GOSUB 4300
3190 M=X
3200 GHGH=1
3210 GOSUB 5260
3220 IF RND>.5 THEN 3250
3230 N=3
3240 GOTO 3260
3250 N=31
3260 IF N=31 THEN 3510
3270 I=3
3280 CALL HCHAR(M,N,33)
3290 N=N+1
3300 CALL HCHAR(M,N,41)
3310 CALL SOUND(60,220,0)
3320 IF (X=M)*(Y=N)=1 THEN 3
900
3330 CALL HCHAR(M,N,33)
3340 N=N+1
3350 CALL HCHAR(M,N,40)
3360 CALL SOUND(60,220,0)
3370 IF (X=M)*(Y=N)=1 THEN 3
900
3380 IF N=15 THEN 3460
3390 CALL KEY(0,K,S)
3400 IF S=0 THEN 3450
3410 GOSUB 1450
3420 GOSUB 1630
```

```
3430 GOSUB 1770
3440 GOSUB 1980
3450 GOTO 3280
3460 SC=SC+150
3470 CALL HCHAR(M,N,33)
3480 CALL HCHAR(3,26,110)
3490 CALL HCHAR(M,3,40)
3500 GOTO 3740
3510 I=31
3520 CALL HCHAR(M,N,33)
3530 N=N-1
3540 CALL HCHAR(M,N,43)
3550 CALL SOUND(60,220,0)
3560 IF (X=M)*(Y=N)=1 THEN 3
900
3570 CALL HCHAR(M,N,33)
3580 N=N-1
3590 CALL HCHAR(M,N,42)
3600 CALL SOUND(60,220,0)
3610 IF (X=M)*(Y=N)=1 THEN 3
900
3620 IF N=17 THEN 3700
3630 CALL KEY(0,K,S)
3640 IF S=0 THEN 3690
3650 GOSUB 1450
3660 GOSUB 1630
3670 GOSUB 1770
3680 GOSUB 1980
3690 GOTO 3520
3700 SC=SC+150
3710 CALL HCHAR(M,N,33)
3720 CALL HCHAR(3,26,110)
3730 CALL HCHAR(M,31,42)
3740 RETURN
3750 GOSUB 1450
3760 GOSUB 1630
3770 GOSUB 1770
3780 GOSUB 1980
3790 IF CHH=2 THEN 3820
3800 GOSUB 2170
3810 IF CHH=1 THEN 3880
3820 GOSUB 2670
3830 CHH=1
3840 RANDOMIZE
3850 GOSUB 3170
3860 GOSUB 4300
3870 GOTO 3750
3880 CHH=2
3890 GOTO 3840
3900 CALL SOUND(-4000,-7,8)
3910 LIV=LIV-1
3920 IF LIV=0 THEN 4060
3930 LIV$=STR$(LIV)
3940 FOR K=1 TO LEN(LIV$)
3950 CALL HCHAR(2,27+K,ASC(S
EG$(LIV$,K,1)))
3960 CALL HCHAR(X,Y,32)
3970 CALL HCHAR(A,B,32)
3980 CALL HCHAR(C,D,32)
3990 NEXT K
4000 A=3
4010 C=3
4020 B=12
4030 D=20
4040 IF GHGH=1 THEN 4240
4050 GOTO 1290
4060 CALL SOUND(190,440,0)
4070 CALL SOUND(190,220,0)
4080 CALL SOUND(190,110,0)
4090 IF SC<=HSC THEN 4110
4100 HSC=SC
4110 CALL CLEAR
4120 PRINT ::::::TAB(5);"YOU
R SCORE WAS";SC
4130 PRINT ::TAB(4);"PLAY AG
AIN?   Y OR N "
4140 CALL KEY(0,K,S)
4150 IF S<>0 THEN 4200
4160 JJ=INT(RND*1650)+110
4170 CALL SOUND(80,JJ,12)
4180 RANDOMIZE
4190 GOTO 4140
4200 IF K<>89 THEN 4230
4210 RESTORE 860
4220 GOTO 180
4230 END
4240 CALL HCHAR(M,N,32)
4250 IF N<16 THEN 4280
4260 CALL HCHAR(M,31,42)
4270 GOTO 4290
4280 CALL HCHAR(M,3,40)
4290 GOTO 4050
4300 IF X<>3 THEN 4940
4310 IF Y<>26 THEN 4940
4320 CALL SOUND(300,110,0)
4330 CALL SOUND(80,220,0)
4340 CALL HCHAR(X,Y,32)
4350 SCREEN=SCREEN+1
4360 SC=SC+BON
4370 CALL HCHAR(A,B,32)
4380 CALL HCHAR(C,D,32)
4390 IF SCREEN>10 THEN 5310
4400 ON SCREEN GOSUB 32767,4
450,4510,4580,4660,4730,4790
,4840,4900,4950
4410 GOTO 5050
4420 CALL HCHAR(1,11,32)
4430 CALL HCHAR(1,32,32)
4440 GOTO 4400
4450 CALL VCHAR(19,13,32,4)
4460 CALL VCHAR(19,19,32,4)
4470 CALL HCHAR(19,13,152)
4480 CALL HCHAR(19,19,152)
4490 CALL COLOR(12,15,1)
4500 RETURN
4510 CALL VCHAR(14,7,32,4)
4520 CALL VCHAR(14,25,32,4)
4530 CALL HCHAR(14,7,152)
4540 CALL HCHAR(14,25,152)
4550 CALL CHAR(120,"10387CFE
DAFE")
4560 CALL COLOR(12,7,1)
4570 RETURN
4580 CALL VCHAR(9,10,32,4)
4590 CALL VCHAR(9,22,32,4)
4600 CALL HCHAR(9,10,152)
4610 CALL HCHAR(9,22,152)
4620 CALL CHAR(120,"3C7EFF7E
3C244281")
4630 CALL COLOR(12,8,1)
4640 CALL SCREEN(4)
4650 RETURN
4660 CALL VCHAR(4,8,32,4)
4670 CALL VCHAR(4,24,32,4)
4680 CALL HCHAR(4,8,152)
4690 CALL HCHAR(4,24,152)
4700 CALL CHAR(120,"7EFF99FF
24243C7E")
4710 CALL COLOR(12,12,1)
4720 RETURN
4730 CALL VCHAR(4,16,32,4)
4740 CALL HCHAR(4,16,152)
4750 CALL CHAR(120,"FFC3BDBD
BDBDC3FF")
4760 CALL COLOR(12,4,1)
4770 CALL SCREEN(16)
4780 RETURN
4790 CALL VCHAR(9,16,32,4)
4800 CALL HCHAR(9,16,152)
4810 CALL SCREEN(2)
4820 CALL COLOR(15,15,1)
4830 RETURN
4840 CALL VCHAR(14,16,32,4)
4850 CALL HCHAR(14,16,152)
4860 CALL CHAR(120,"247EBD24
2424247E")
4870 CALL SCREEN(16)
4880 CALL COLOR(12,14,1)
4890 RETURN
4900 CALL VCHAR(19,16,32,4)
4910 CALL HCHAR(19,16,152)
4920 CALL COLOR(12,8,1)
4930 CALL COLOR(15,2,1)
4940 RETURN
4950 CALL VCHAR(4,20,32,4)
4960 CALL HCHAR(4,20,152)
4970 CALL CHAR(120,"181818FF
FF181818")
4980 CALL COLOR(12,7,1)
4990 CALL SCREEN(11)
5000 CALL COLOR(15,16,1)
5010 CALL VCHAR(4,12,32,4)
5020 CALL HCHAR(4,12,152)
5030 CALL VCHAR(4,16,144,4)
5040 RETURN
5050 BON=SCREEN*100
5060 BON$=STR$(BON)
5070 SC$=STR$(SC)
5080 SCREEN$=STR$(SCREEN)
5090 FOR K=1 TO LEN(SCREEN$)
5100 CALL HCHAR(1,9+K,ASC(SE
G$(SCREEN$,K,1)))
5110 NEXT K
5120 FOR K=1 TO LEN(SC$)
5130 CALL HCHAR(1,17+K,ASC(S
EG$(SC$,K,1)))
5140 NEXT K
5150 FOR K=1 TO LEN(BON$)
5160 CALL HCHAR(1,28+K,ASC(S
EG$(BON$,K,1)))
5170 NEXT K
5180 B=12
5190 D=20
5200 A=3
5210 C=3
5220 FOR I=3 TO 23 STEP 5
5230 CALL HCHAR(I,YY(I),112)
5240 NEXT I
5250 GOTO 1290
5260 SC$=STR$(SC)
5270 FOR P=1 TO LEN(SC$)
5280 CALL HCHAR(1,17+P,ASC(S
EG$(SC$,P,1)))
5290 NEXT P
5300 RETURN
5310 DIM F(21),TT(21)
5320 RESTORE 5470
5330 FOR I=1 TO 21
5340 READ F(I)
5350 NEXT I
5360 FOR J=1 TO 21
5370 READ TT(J)
5380 NEXT J
5390 V$="CONGRATULATIONS!"
5400 RC=13
5410 CR=8
5420 GOSUB 5780
5430 FOR I=1 TO 21
5440 CALL SOUND(TT(I)*190,F(
I),2)
5450 NEXT I
5460 GOTO 4090
5470 DATA 247,247,262,262,24
7,262,247,220,196,185,294,26
2,247,196,262,220,294,262
5480 DATA 247,220,196
5490 DATA 2,1,1,1.5,1,1,1,1,
1,3,2,2,.5,.5,.5,.5,1,.9,2.2
,2,2
5500 PRINT ::::::::TAB(12);"
KEYS"
5510 PRINT TAB(12);"____"
5520 PRINT ::::::
5530 PRINT TAB(3);"ENTER THE
 ASCII CODES"
5540 PRINT TAB(8);"OF YOU CH
OICE"
5550 PRINT :TAB(3);"USER'S R
EFERENCE GUIDE"
5560 PRINT TAB(2);"PAGE 102
 UPPER CASE ONLY"
5570 PRINT
5580 INPUT "KEY LEFT":J1
5590 PRINT
5600 INPUT "KEY RIGHT":J2
5610 PRINT
5620 INPUT "KEY UP":J3
5630 PRINT
5640 INPUT "KEY DOWN":J4
5650 CALL CLEAR
5660 PRINT ::::::::TAB(4);"T
HE TREASURE OF XEROX"
5670 PRINT ::TAB(7);"COPYRIG
HT 1984"
5680 PRINT :TAB(6);"CHRISTOP
HER ROCK"
5690 PRINT ::TAB(3);"PRESS A
NY KEY TO BEGIN"
5700 CALL KEY(0,K,S)
5710 IF S<>0 THEN 5760
```

```
5720 JJ=INT(RND*1650)+110
5730 CALL SOUND(80,JJ,12)
5740 RANDOMIZE
5750 GOTO 5700
5760 CALL CLEAR
5770 RETURN
5780 FOR K=1 TO LEN(V$)
5790 CALL HCHAR(RC,CR+K,ASC(
SEG$(V$,K,1)))
5800 NEXT K
5810 RETURN
```

T.I. A LIFE SAVER



We all know that the 99/4a is a great computer for game-addicts, but also we know for a fact that many of you have put your machine to other, more serious and varied uses. We really would like to know if yours is a case in point. Perhaps you use it for business purposes, maybe it controls a burglar alarm, could it be that you have rigged it to wake, wash, shave and dress you in the morning? Please let us know of any interesting ways that you have used your TI, no matter how trivial.

Our thanks go to Andy Cory for getting the ball rolling in this issue. Read on and find out how the TI has become a LIFE SAVER!

- You may well wonder what on earth is the basis for such a remark. As a District Staff Officer at Brixham Maritime Rescue Sub Centre (H.M. Coastguard Rescue HQ for S.Devon and SE Cornwall) and an owner of a TI 99/4a for two years, I have been keen to see how computers can be applied within an emergency service like ours. As well as being the sole coordinators of all maritime and coastal search and rescue measures for UK waters, we expend considerable effort at Boat Shows etc. encouraging safer actions from the public when they visit our coasts or venture afloat - prevention being so much better than the cure.

Along with one or two other Coastguards and micros, I was able to help demonstrate the potential computers have in planning operational searches - a manual operation which may at present take hours can be done in minutes with computer help. In fact I still use my original demo program for training and practical purposes.

Interestingly as a large proportion of this program negates the need for chart plotting, it lends itself to numerous navigational and position fixing applications for yachtsmen etc...

On the PR front my Rescue Game program (TI 99/4a ExBas) not only saved our publicity department considerable funds but, initially at Southampton Boat Show and latterly at London International Boat Show (Jan 85), proved one of the star attractions of H.M. Coastguards display stand. So effective was the game that we are now considering putting the original package into our mobile display vehicles and providing an enhanced (+32K RAM Disk) and more adaptable game for our larger more prestigious events.

I am at present using my TI to look into Database possibilities and how the TI's powerful string handling capabilities may be of assistance on our administration front with storage and retrieval of statistics and calculations for control of all Coastguard resources.

BRIGHT SPARKS

.The Bright Sparks intro to Assembly

I hope to introduce you to machine code in this series. As I do not class myself as a machine code expert yet I hope that the more experienced hackers out there will write in so we can make this a regular series.

We will try to keep mainly to the Minimemory but any listings will have to be written using the Editor Assembler package. The differences will be covered later.

For those of you who are complete beginners I hope the following explanation will help to clear a few mysteries.

The computer only understands one language which is commonly called MACHINE CODE, the Basic you write is converted to machine code by an interpreter. This is esentially the same as an interpreter who converts say French to English. Because the interpreter is not very smart it has to convert every line in BASIC to the corresponding machine code.

To write in machine code would be a very long drawn out process, as the computer only understands either 0's or 1's and to write a program with just zero's and ones would make the result unreadable and very difficult to write.

However to make writing programs easier another program was written which allows you to enter the various commands in a more readable form. This program is called an assembler as it 'assembles' the bit's you write into what the machine can understand. The minimemory comes with it's own assembler on tape called a LINE-BY-LINE assembler. This converts the part you write (the source code) into what the machine understands (the object code) as you type in the commands.

Although assembly language makes life easier for the programmer you still need to plan your programs very carefully. Having said that assembly language is not that difficult if you have the time and the patience.

Right, just to whet your appetites let's write a small program to print something onto the screen.

```
        DEF START     *ed/ass only
        REF VMBW      *ed/ass only

START   LI R0,10      *START for ed/ass
        LI R1,TE
        LI R2,11
        BLWP @VMBW    *ed/ass use BLWP @VMBW
JP      JMP JP
TE      TEXT 'HELLO THERE'
        END
```

To enter this program load your line by line assembler tape (see last issue).

Enter NEW as the program name then press enter, then enter the program above.

Now you have just written your first program in machine code you can run it by using the easy bug command E followed by the numbers 7D20 <enter>.

Now back to the serious stuff. Instead of variables in machine code you have registers. The TI-99/4A can use sixteen registers at once (R0 to R15). Using these registers you can manipulate the information, and do all sorts of tests and comparison.

You can place into these registers a value between 0 and 65536 which if you convert that figure to binary you will see that there are 16 digits. As computers can only work with two values either ON or OFF computers really work in binary, as a long binary number is very difficult to work with we usually use hexadecimal for the values. Most of you have used hexadecimal when you used the CALL CHAR statement in BASIC.

Now we have briefly covered the basics we'll do a few simple exercises.

In BASIC you use a lot of statements like X=10, but when writing in assembly language it is nearly as easy as you use LI R0,10 or LI R0,>A both these are the same, the first puts the decimal value 10 into register 0 and the second puts the hexadecimal value A which is 10 in decimal into register 0. (hexadecimal numbers must have a > in front of them so the computer knows the numbers you are using).

Consider the following small basic statement:

```
CALL CLEAR
```

We'll now convert this into an assembly language program so you can get the general idea.

The CALL CLEAR statement places spaces in all positions of the screen so that is what our assembly program must do.

Below is for the minimemory. Notes for ED/ASSEMBLER are shown where appropiate.

```
      AORG >7D20      *For ED/ASS insert
      LI R0,0
      LI R1,32
LO BLWP @>6024
      INC R0
      CI R0,768
      JLT LO
      B *R11
```

To run from minimemory select EASYBUG and then use E 7D20. For editor assembler when typed in save to disk, then assemble the program and use the load and run option with the program name START.

The first line loads into register 0 the value 0, why? Well there is a table in the video memory which has the character codes for each position on the screen. This table (block of memory) starts at address 0 in VDP memory and since there are 768 (24) positions on the screen it goes all the way to address 767, remember we started counting at 0 in decimal.

The second line places the value 32 into register 2, this is the code for a space character which is what we are going to place at all addresses from 0 to 767.

Next we have the line LOOP BLWP @VSBW the 'LOOP' can be thought of as a line number. The BLWP can be thought of as a GOSUB and the @>6024 tells the computer to look at the value at >6024 and then use that as the location in memory as the start of the subroutine. This subroutine built into the computer writes a byte to a specified address in the VDP memory.

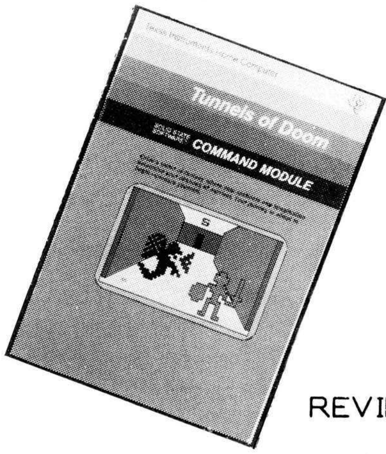
The next line INC R0 adds 1 to the contents of R0 ready to place a space on the next screen position.

Then we test to see if we have placed spaces in all screen positions, we do this by comparing the contents of R0 with 768 and if R0 is less than this value we jump to the line LOOP else we exit the routine. JLT means if the result of the test was less then we go to LOOP otherwise we carry on with the next instruction.

Bye for now!

REVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEW

TUNNELS OF DOOM



REVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEW

TUNNELS OF DOOM - review

Eric Seablade squared up to the Zombie. With sword in hand he chose to fight rather than to negotiate or run. Time was running out, and he still had to rescue the King. A check on the monster status report revealed that his adversary had a weakness - a low mobility factor. A walkover it was not, though. A battle of wits and strength ensued, and only after using his Lightning Rod did Eric emerge triumphant. He used one of his special powers to check for secret doors in the tunnel ahead, and having found one, used another special power to listen for hidden dangers. Who could say what lay behind the door......??

We are often asked to describe new modules as they appear. TUNNELS OF DOOM is one that frequently crops up - the truth is that it is hardly new. It appears that a combination of spasmodic scarcity, comparitively high price, and lack of publicity has left this rather brilliant work out of the public eye. The funny thing is that these elements have now contributed to the modules' belated fame, and we find what amounts to a cult following.

To capture on the written page the essence of the game is well nigh impossible, so here I am - prize mug - trying to do just that.

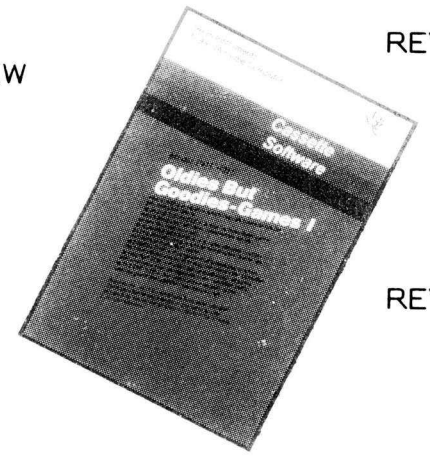
Imagine 10 floors (that is the maximum option), each with a maze of corridors and rooms to explore. Down there - somewhere! - are the objects of your quest, and on the way there will be a variety of challenges and surprises to cope with. Not such an unusual scenario, maybe, but the sheer complexity in the structure of the game, and the spectrum of options available to you are guaranteed to keep you totally absorbed.

Appeal is increased by the fact that this is NOT just a text adventure. Certainly choices must be made, and strategy IS crucial, but at all times there is graphic representation of what is happening. 3D views of corridors (movement here is not sluggish as in some TI Basic '3D mazes'), status reports, maps, plan views of rooms; all maintain interest and bring you into the situation. Monsters and adversaries appear on the screen, and battle scenes are enacted with moving characters, weapons and missiles.

Right from the start there are choices to make - your 'party' may comprise up to four, and there is a range of character types to select from, each having their own unique characteristics and abilities. I will not provide here any more in the way of detail regarding the focal points and personalities of the game. This is partly to let you find out for yourself, partly because having begun I would not know when to stop.

Suffice to say that Tunnels of Doom compares to Invaders in the same way that a T-Bone Steak does to Corned Beef - to be taken seriously, to be savoured, and so much more to get your teeth into!

REVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEWREVIEW



OLDIES & GOODIES 1

In this day of snappy-titled and fast-action games, we are tempted to ignore the cheaper, less attractive sounding software. Often a wise policy, but you know there are some bargains around, and some bear looking at. Because although novelty value is minimal, the games have very often stood the proverbial test of time as popular family favourites.

OLDIES and GOODIES - a case in point. This comes as five programs on a cassette complete with manual up to Texas Instruments usual standards.

The first game to load from the cassette goes by the name of WORD SCRAMBLE. This is a one or two player game, the object being to unscramble the word being displayed. There are various options to choose from including the number of letters in the word, entering your name, and the speed that the counter counts down. As you have probably guessed this game is against the clock and does get rather frustrating when you are 'racking' your brain to try to find the correct word.

Next on the tape was, guess what, NUMBER SCRAMBLE. This is similar to the old favourite, the 15 puzzle, where you have to slide tiles about to place them in order. However, the computer version has two games: a match game where the numbers are prearranged or a random game where the numbers are located randomly. There are options for two players and with the different options not a bad implementation.

(See the BUGBUSTERS page - Ed.)

Next was BIORYTHYM - not quite a game, but is supposed to tell you what your emotions, intelligence, and physical fitness, factors will be on the required day. This was quite good fun today - I should have stayed in bed. The graphics reminded me of three thermometers and display a month's results at one time.

FACTOR FOE - the next game-could be called more of an educational game. In this one the computer lists a series of numbers and you get points for the number and the factors of that number. If you can't remember what a factor is it's a number that will divide evenly into another number. Not only have you that, but this game requires quite a bit of thinking about otherwise the computer of your opponent ends up with all the numbers that don't have factors.

Lastly, probably the most famous game around, TIC-TAC-TOE. This of course needs no introduction, a quite good representation of O's and X's. As I found out this is one game where a draw is the usual outcome of the match, except perhaps for the younger folk. The graphics are large and chunky and would make a good introduction to the young un's, or for just passing some time.

Although none of the games are entirely original there are 5 games of good standard, and most of them can be played by one or two players. This is a perfect cassette for those rainy days and should provide a good few hours of entertainment. I think for 5 games at a low price you can't go wrong, can you?

cant do that

In the last issue we were asked two interesting questions:-

a) What is the advantage and purpose of the DEFine function? e.g. suppose I want to define PI as 3.149 etc.

Why should I define it, rather than simply create a variable with it?

e.g. 100 PI=3.149

Well, we thought that this function was fairly well covered in the User Guide, albeit after some serious head-scratching. The fundamental principle to understand is that DEF really has its purpose where your program has variables that are interdependent, and where you want to DEFine a specific relationship between them, even though their own values may change during the running of the program.

Looking at the following two short routines you will see the difference. In the first, we start be saying that A=B+C, but because A has a zero value at that point, so it remains. However, in the second instance, we DEFine that whatever values B and C subsequently have in the program, A will always hold the value of the sum of them. If you run the two programs you will see the results printed, yet that little 'DEF' is the only difference between them!

```
100 A=B+C
110 B=1
120 C=2
130 PRINT "A=";A
140 B=2
150 C=3
160 PRINT "A=";A
```

```
100 DEF A=B+C
110 B=1
120 C=2
130 PRINT "A=";A
140 B=2
150 C=3
160 PRINT "A=";A
```

More can, and maybe will be said about DEF in future.

b) On other computers I have seen tricks performed to produce an illegal line number 0. Although TI BASIC is well protected, is this possible?

Yes, it is possible, because I have done it - but I'm blowed if I know how or why it happened! If anyone out there knows how to produce this condition, please put us out of our misery.

Scott Rosser of Beddington writes:-

- my single 'CS1' (Ferguson 3T27) has suddenly begun 'writing' its own data, and has caused more 'Error in Data messages than I care to remember. It's probably due to a faulty record head, as special cleaning tapes seem to have little effect....
- has anyone else dealt with a similar problem? I'd be glad to hear about them through your mag.

Mr J.E.Marks of Plymstock asks:-

- Please could you give me a simple 'hit' routine, as I just cannot work out (after 14 months) how it is done.

Mr Fairbairn of Fort William is fishing for ideas:-

- you see I need a record- keeping system to tell me any date, what fish I caught, what loch, the condition of fish, water temperature etc, etc. Then at the touch of a key, to tell me all the fish caught in said loch, and on what date....

Seeing as how Angling is so popular these days, we wondered whether anyone had 'tackled' this idea.

Dr B.E.Davison of Wood Green has a familiar query:-

- A drawback (no pun intended!) with the 99/4a is that the simple plot and draw routines for joining points on the screen are absent. I wish to draw organic chemical structures. Any suggestions?

James Jonathon Smith of Market Rasen poses a less common question:-

I have aquired 2 TI 99/4a computers and I want to join them in a sort of TI 'net' like Sinclair, so that they can communicate with each other. Unfortunately I only have one tv so I would have to do it so that if a key on either console is pressed it would react likewise on the screen.

I have thought of solving my problem by using the interface on the right-hand side of the console, but I do not know the codes for them so that is out of the question, so I think I will have to use the cassette interfaces. I also have Extended Basic and Minimemory. Would these be of any help? I would be very grateful if you could send me some information to point me in the correct direction.

Mark McGurn of Holmes Chapel wants to know:-

- Please can you tell me how to detect if the joystick fire button is pressed during an Extended Basic program?

CAN'T DO THAT
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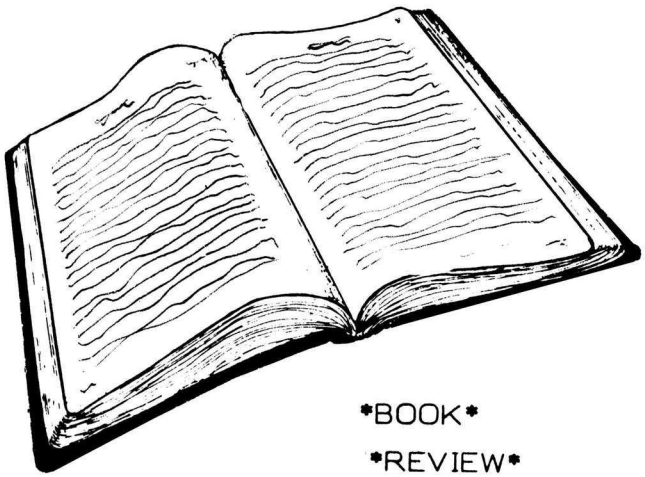

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PROGRAMMING BASIC WITH THE T.I. HOME COMPUTER

Book Review by Steve, Leeds

I read this book not knowing what a keyboard looked like; after reading it I had a good basic knowledge of how to program using TI Basic (sort of basic basic really).

Now I have just to figure out how to turn the computer on - this being about the only thing the book doesn't cover in detail.

It takes you steadily, step by step, adding a small handful of commands each chapter, after which you can sit down and read the discussion material that explains in detail the commands just learnt. Then it's pencil and paper time to answer some questions using what you've just done, but in different applications, (this is where you're supposed to learn more, aren't you? I don't know, I still can't turn the computer on to find out!)

All in all it is a good book that teaches you basic. However I do feel that if you want to write games for example, you will need something like the games-writer packs to knit everything together into a decent program. (Hopefully!)

*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW*REVIEW

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They say that wen they make this magasine they dont want to miss anyboddy out, least of all us young People and if so then they want to here from us. They want to know WHO we are HOW OLD we are and Wat wE WANT in our section.

Please write a letter to:-

"LITTLE BITS"
99/4a Magazine
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I guess that you all spent so much time writing thankyou letters over the Christmas and Easter periods that you didn't get a chance to reply to our call in issue 2! Just in case, we are repeating the page here, and if there is no response this time we will assume that your needs are being met already by this or other magazines.

One response we did have was from Stephen Meadows (14), who asked whether short programs and articles and codes for graphics (such as Space Invaders, Pac-men etc.) would be popular.

He has sent in a few graphics with their hexcodes to start it off:

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*****JOYSTICK BENDERS*****
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SLYMOIDS	113,905
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****
***** TOP FIVES *****
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As recorded during our Winter Sale

Games Five

Protector II
Hunt the Wumpus
Picnic Paranoia
Munchman
TI Invaders

Tape Five

Virgin Set
Market Simulation
Oldies/Goodies I
Pilot
Hunchback Havoc

Serious Five

Collins Packs
Home Budget Mgmt
Extended Basic
Editor/Assembler
Psnl Financial Aids

Bookworm Five

Dynamic Games
Initiation/Assembly
Technical Data
Getting Started
Progs for TI HC

BULLETIN BULLETIN BULLETIN BULLETIN BULLETIN BULLETIN BULLETIN BULLETIN BULLETIN

BULLETIN BOARD is a multi-purpose point of contact where you can 'pin' your details if you are in a position to give or receive information, or just swap notes with other users. Primarily those of you with specialist interests or equipment such as modems, terminals or teletypes will be glad to know of others who share your interests and who may be of mutual help, but it need not stop there. If you would like your name pinned on the BULLETIN BOARD for any reason, send your name, address, phone number, and (where appropriate) details of your equipment to:-

BULLETIN BOARD, 99/4a MAGAZINE, PARCO ELECTRICS, 4 DORSET PLACE, NEW STREET, HONITON, DEVON, EX14 8QS.

BULLETIN

Mr Killeen
33 Mayflower Mews
Off Grundy Street
West Houghton
Bolton
Lancs

RADIO HAM - interest in RTTY
(wants a prog. for above)

BULLETIN

Mr Stanley Dixon
28 Grange Park Road
Leeds 8
LS8 3BB

Wants contacts re PASCAL

BULLETIN

Mr Andy MacMahon
Church Cross
Skibbereen
Co. Cork

Well-equipped TI freak!
RADIO AMATEUR EI7AYB
MEMBER of AMSAT UK Sattellite Org.

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BULLETIN

Mr John Wiles
38 Northwood Lane
Clayton
Newcastle-under-Lyme
Staffs
ST5 4BN

Tel. 625960

RTTY/HAMSOFT - has several progs for amateurs

BULLETIN

Mr D G Tilling
27 Pewley Hill
GUILDFORD
GU1 3SN

Tel. 0483 36178

Radio ham - TI99/4a and AMTOR terminal

CALL SIGN: G3PGT

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Mr D.G.Hewitt
311 London Road
Headington
Oxford
OX3 9EJ

Oxford 67165

CALL SIGN G8PQG

RTTY/HAMSOFT -
has some interesting
programs for enthusiasts

BULLETIN

Mr B.R.Adams
12 The Tennis
Cassington
Oxford
OX8 1EL

Oxford 880229

CALL SIGN G8CCI

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