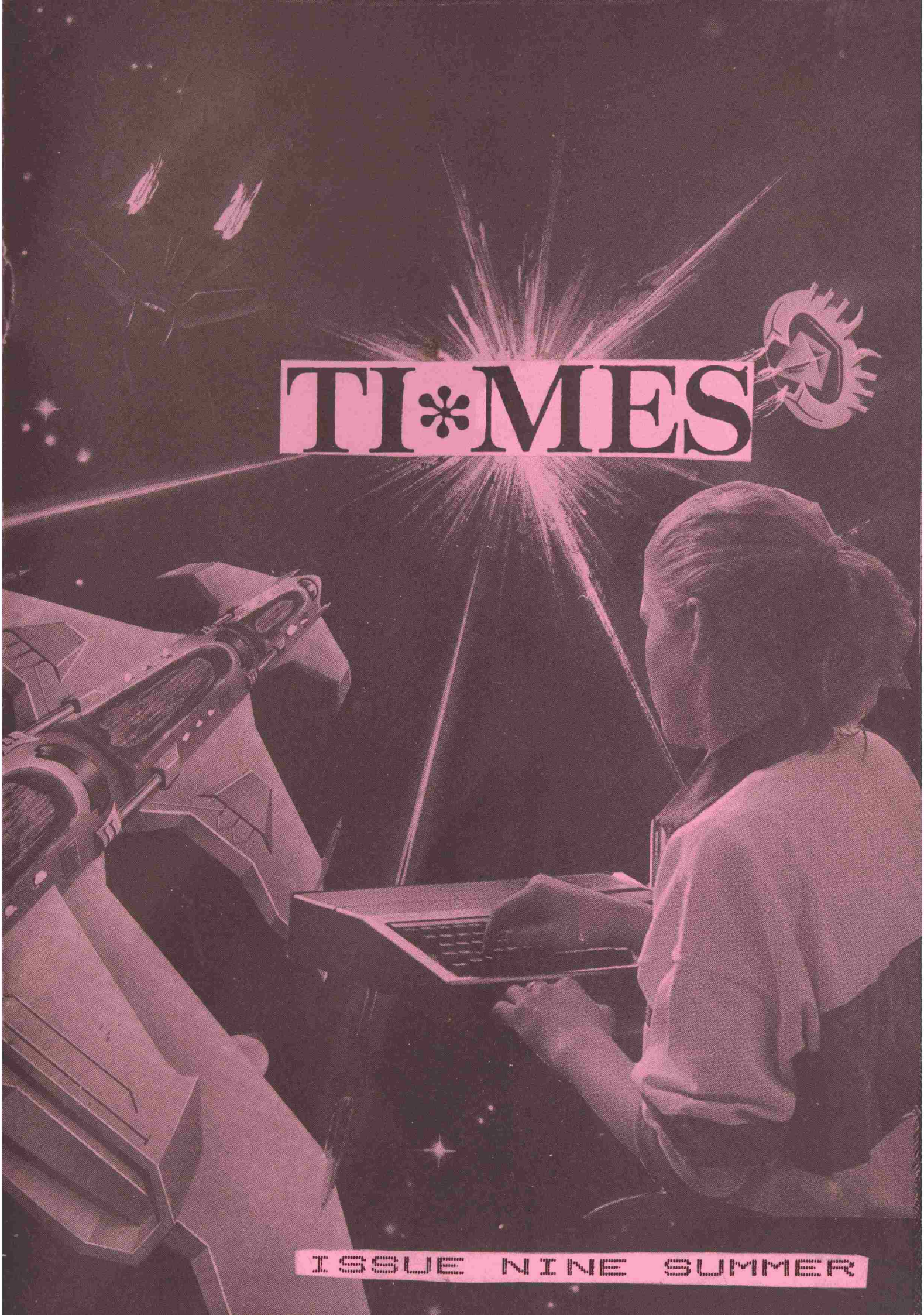
TI*MES
ISSUE NINE SUMMER

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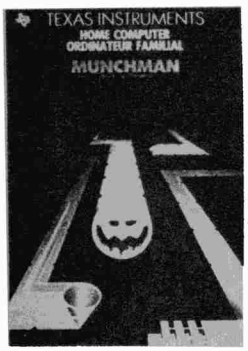

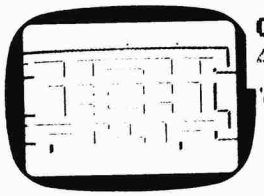

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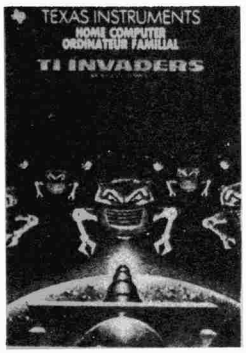

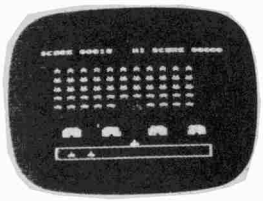

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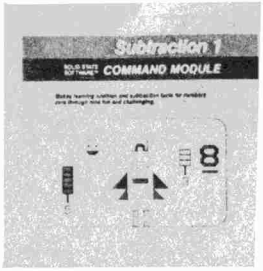

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SUMMER 1985 NUMBER NINE

40,Barrhill,Patcham,BRIGHTON,East Sussex,BN18UF.Tel:0273 503968(evenings)

HAPPY BIRTHDAY TO US
2 YEARS OLD AND GROWING

It is a real sense of achievement to reach our second birthday issue. Without the continued support of our verbous contributors and voracious readers we could not continue. Keep it coming and we'll keep it going.

Our second Users show in Brighton was an enjoyable and successful day. This time we had more opportunities to meet and talk to you and also to show you something of the TI99s capabilities. Two successful introductions at the show were the Doctors clinic and the auction/swap shop. John Rice did a stalwart job of debugging some bugs, as you will see from his article. Lots of people went away clutching bargains from the auction which was a great hit and entertainment thanks to Ivan Nibur.

We have decided to hold another show in the Autumn and the venue is DIGBETH CIVIC HALL, BIRMINGHAM on SATURDAY 26th OCTOBER. Put in in your diary NOW.Let us have your ideas. Let us have your help. Let us see you there.

It's a small world isn't it. Apart from our contacts with the TI groups in Holland featured in this newsletter, we have recently had contact with TI users from Sweden, Norway, Belgium,USA and Australia. A gentleman from Belgium and Paul Doyle from the Sydney users group visited the Brighton show. It was our great pleasure last month to entertain Albert Lawrence, the librarian of the Newcastle branch of Sydney users group.(Would you believe his brother lives 500 yards away). There is an amazing feeling of camaraderie between TI users which I suspect is lacking with other computer users. If you are feeling lonely and think you are the only TI user in your neck of the woods let us know and we will include your name in the list of area contacts. It could be the beginning of a meaningful relationship.

The computer market remains volatile. Large and apparently successful companies are beginning to crumble. Sinclair is needed a 15m injection of cash. Tiger distribution, one of the larger suppliers has gone into liquidation. The super magazine Personal Computer Weekly has folded. Even the mighty Acorn/BBC has had to be rescued by Olivetti. Is it true that they are replacing the £ sign on the keyboard with a Lira sign, or to be more accurate 20,000 of them. There is a lot of chaff still to blown away before the market settles down. And we know what its like ,we've been there!

We have heard of a new TI CLUB being started in Scotland. They have mailed out to the 3,000 or so ex-members of TIHCUC intending to send out a large glossy magazine but we understand the response has not been good. Not all TI owners are so pathetic are they!

If you wondered what happened to Craig Millars excellent mag. Smart sprite programming let me tell you he has produced three editions which have not been sent to the UK as he was not paid by the UK agent. On top there are to be another 5 issues which can be bought direct at $2.17 each airmail.

In case you are wondering when you should renew your subscription please look at your address label. The second number indicates the number of the last issue of the newsletter you receive, IE if you have 9 please renew now.

Happy computing,

Alice

TI99/4a Exchange TI*MES newsletter is supported only by its subscribers. This TI users Group is INDEPENDANT of Texas Instruments and is completely non profit making. TI*MES is published quarterly, JANUARY, APRIL, JULY, and OCTOBER months.The annual subscription is £6 and includes 4 newsletters. Editorial etc is provided by group members, other user-groups and other related sources.. Views expressed are those of the writer and not necessarily those of TI99/4a Exchange. Whilst efforts are made to ensure accuracy no responsibility can be accepted by TI 99/4a Exchange as a result of the applying of such information found within the pages of TI*MES . You are invited to contribute copy for publication in TI*MES. If you would like to make a contribution please submit copy on A4 only this MUST be typed with a disk or tape if a program is included. Unaccepted material will be returned ONLY if accompanied by a S.A.E. The editors reserve the right to refuse advertising.

YOUR LETTERS

Mr TUDOR-WILLIAMS of HITCHEN writes:- Your magazine continues to cheer.One of the more irritating features of the machine must be the proliferation of electric spagetti which build up around it. Surely there must be clever owners who have designed cute semi-static assemblies to cope with this. How about an invitation to publicise their solutions.(I hate cutting leads only to find that someone else has done it neater and which, having cut, I can no longer emulate.)

Mr.D.HEWITSON of LANCASTER writes:- How many owners appreciate the astonishing numerical accuracy of the TI99/4a. Pick an "awkward" decimal fraction to irritate the binary system, drive in round a simple additive loop a few thousand times and compare the results similarly obtained on any other home computer including the BBC. The latter is faster, but it starts to display significant arithmetic error long before the TI.

David VINCENT of SWANLEY,Kent writes at length on a remarkable example of customer service relating to a printer bought from ARCADE HARDWARE which appeared to be blowing chips in the interface card. Howard GREENBERG proprietor of ARCADE HARDWARE visited Dave en route to the Brighton show and eventually found a fault in Dave's expansion box."The results of their labour were, for their own part, an obvious financial loss, and a very tiring and frustrating evenings "entertainment" sorting out a problem in equipment which they didn't even supply. For my own part, I am a very grateful and amazed customer who is prepared to state quite categorically that "service" from Arcade Hardware is unparalleled in my experience."

MIKE LUCKEN of Middlesex writes:- Library program U26, Disassembler program is excellent byt I did find a problem in that it did not correctly dissassemble Format 1 instructions. Change the following lines:-

```
2560 E$SEG$("SZC SZCBS SB C CB CB A AB MOV MOVBSOC SOCB",1+4*INT99V-16384)/4096),4)
2615 T=VAL(SEG$(NYB$,3,1))
3085 SR=R
3110 E$=E$&" "&"R"&STR$(SR)&","&SRT$(R)
```

EDITOR:- Please check if you have this library program .

STAN DIXON of LEEDS writes:- FIF(UK) membership secretary is Roger Firth at 7 Wynham Cres,Woodley, Reading. BLUG have also moved - Richard Olney, London Techology Network,86-100 St Pancras Way, London NW1 9ES, Tel 01 267 0642.

PLEASE REMEMBER IF YOU ARE WRITING TO ANY OTHER MEMBER OR A CONTRIBUTER TO THE MAGAZINE TO INCLUDE A STAMPED ADDRESSED ENVELOPE FOR YOUR REPLY.

AREA CONTACTS

These are members who have the wish to have contact with other users in their area. Let us know if you wish to be included.

Henry Clark,60 St Pauls Road, New England,PETERBOROUGH, Cambs. 0733 42642

Harry Pridmore, 17 Jerrards Close, HONITON,Devon. 0404

John Carter, 16 Sherwood Ave, NORTHAMPTON. 0604 842760.

Simon Pryce, 48 Mount Street, SHREWSBURY,Salop. 0743 67799. Interested in amateur radio

John Bingham, Rygghagen 7B, 4070 Randaberg, Stavanger, NORWAY. 04-599228

FORTH INTEREST. Stanley Dixon, 28 Grange Park Road, LEEDS, LS8 3BB.

PASCAL INTEREST. Stanley Dixon, 28 Grange Park Road, LEEDS, LS8 3BB. Graham Hilton, 8 Sandwich Close, Saint Ives, CAMBRIDGE. 0480 65228.

Richard Owen, 17 Highfield Ave, Litchard, Bridgend, Mid-Glam, SOUTH WALES.

Alan Davey, 88 Halcombe Estate,Chard, SOMERSET. BULLETIN BOARD SUNDAYS 10am-10pm. Tel 04606 4511.

David Moerel, 6 Chyrose Road, St Day, Redruth, CORNWALL.

MR.B. Sholanke. WELWYN GARDEN CITY, HERTS. Welwyn 27232.

Andy Hopkinson, 16 Linden Wlak, Nth Baddesley, SOUTHAMPTON. 0703 732801.

G.Broomfield, 42 Layton Rd.Parkstone,Poole. DORSET. 0202 722542.(Interested in DIY Hardware)

RANDOM EYES

by Graham Balwin

When the TI 99/4 was introduced way back in 19-mumble-mumble its 16K memory was considered a very respectable and luxurious size for a home computer. Remember the ZX81 and all those books about what you could do with 1K? As time passed and the chip-makers (or marketing men) became cleverer memory sizes crept up, via the BBC B's 32K and the Spectrum's 48K to the 64K that many manufacturers now produce. Since expanding the TI 99/4A to a comparatively modest 48K can cost about twice the price of the bare console most TI owners soon develop a keen interest in economical programming. Many users soon learn the usual tricks about keeping variable names short, removing REMs, using OPTION BASE 1 where possible to save array space and so on but for me one of the most interesting techniques is the cramming of as much information as possible into each program line. This can show considerable savings, as each line takes some less-than-obvious memory for things like the line-number itself, length of line, end of line marker and so on. There is often an increase in speed of execution; something not to be sniffed at when working with the TI...

The PRINT statement is about the easiest to start with when considering memory savings. The print separators ';',':',',' and of course TAB can be used, with suitable care, to squeeze a lot of information onto one line. This simple 5 line program shows what I mean.

```
100 PRINT "FIRST LINE"
110 PRINT "SECOND LINE ";
120 PRINT "FOLLOWING ON"
130 PRINT TAB(17);"TO THE RIGHT"::
140 PRINT "MISS A LINE"
```

That program can be combined onto one line with hardly any effort, as shown below:-

```
100 PRINT "FIRST LINE":"SECOND LINE ";"FOLLOWING ON":TAB(17);"TO
    THE RIGHT"::"MISS A LINE"
```

Let's look now at a way of combining several different statements into one program line. The next program accepts a numerical input and prints the first and last digits to the screen. I know it's fairly pointless and there may be mathematical trick to do it but it should illustrate my point.

```
100 INPUT A
110 A$=STR$(A)
120 B=LEN(A$)
130 B$=SEGS(A$,1,1)
140 C$=SEG$(A$,B,1)
150 D$=B$&C$
160 PRINT D$
170 GOTO 100
```

A brief explaination - lines 130 and 140 extract the first and last digits of the string A$ (derived from the input, A), line 150 concatenates B$ and C$ to allow D$ to contain the first and last digits of A$ and line 160 prints D$. All quite neat and straightforward but let's look a little closer. We've used eight lines and six variables to perform a pretty simple string-chopping exercise and a sobering 198 bytes to do it in. We can trim it down to four lines and two variables, using 115 bytes, as shown here.

```
100 INPUT A
110 A$=STR$(A)
120 PRINT SEG$(A$,1,1)& SEG$(A$,LEN(A$),1)
130 GOTO 100
```

Line 120 is looking a little daunting now but is really only a contraction of lines 120 to 160 of the original listing. Can we squeeze the program a little more and somehow fit line 110 into line 120? Yes, quite easily, and the memory saving is now getting quite impressive.

```
100 INPUT A
110 PRINT SEG$(STR$(A),1,1)&SEG$(STR$(A),LEN(STR$(A)),1)
120 GOTO 100
```

This final version of the program uses 74 bytes, saving a whacking 124 bytes over the original, and, if you own Extended BASIC, you could even cram the whole program onto one line and save another 10 bytes.

I find that the best method of compressing lines in this way is to take things a step at a time, first writing the bare routine with one statement per line, just to get the sequence of events clear in my mind. After thorough checking to make sure the routine works as it should, statements can be combined, one or two at a time, until the routine is as compact as possible. Trying to jump too many steps invariablyresults in at least one bracket going astray, causing a great deal of brow-furrowing until it can be spotted and corrected. Of course, with practise it becomes possible to thread several of the more usual combinations together without this 'step-at-a-time' technique but I still tend to use the method, particularly on new or unusual routines, the pleasures of debugging having evaporated a long time ago.

In this article I've dealt mainly with string manipulations but the same techniques can be used on many other facets of TI BASIC, notably the extremely useful logical operators, of which more anon.

****

Who went to THE SHOW? I did, and I thoroughly enjoyed it. Chief memories are of... the salesmanship of Howard Greenberg, who in response to a casual enquiry about disk systems apparently accessed one out of thin air and had me groping for my credit cards. Sorry, Howard. Better luck next time...the impressive display of 3-D tennis and the Mini-Mem drawing routine on the User Group stand...meeting Peter Brooks, who looks remarkably well on 1½ hours sleep a night...the gentleman (I didn't get his name) who is in the process of interfacing his ZX 81 to a TI to use as a programmable command module, if I understood him right...meeting C & A at last, and what nice people they are, and finally the splendid gent from London's East End who programmed his wife's TI and speech synthesiser with all the stock CB phrases and used it to conduct conversations over the air-waves.

I bought a Munchman module at the show and found that it is the first TI module I've owned that has the 'test' facility built in. For those that don't about it, this facility is accessed by holding down SHIFT and pressing 8 3 8 when the title screen appears. By responding to the somewhat cryptic prompts you can enter the game at any level you choose. Even I can get through the first screen with nine munchmen at my disposal. Is there another access code for modules where this system doesn't work, I wonder?

ED: Good news MUNCHMAN prices slashed to only £4.00 inc
Order through the Group.

Useless Facts No. 27 - Did you know that the longest English word yet discovered that can be typed on the top row of keys is- TYPEWRITER? There's not many people know that...

After several months use I've decided that the Personal Record Keeping module is one of the more useful items TI has produced, and particularly good value at its present price. After a little practise rudimentary data-bases and spreadsheets are fairly easy to set up and run but oh, the speed! If I thought the display speed was leisurely I just couldn't believe it when it came to sorting. Up to fifteen minutes to sort 60 five-field records strikes me as a little excessive, particularly as I wanted to sort all fields, one after the other. I've heard that the module is programmed, at least partly, in BASIC which would account for its lethargy; rather a swiz, I thought, but then I wouldn't like the job of writing it in assembly language... (Couldn't it have been compiled? I believe this has been done with other modules.)

I mentioned TRACE a while back and realised I forgot to add a couple of oddities that it throws up. TRACE prints all program lines it encounters onto the screen, right? Not necessarily. Try it with a FOR-NEXT loop for instance and it appears that the program only looks at the FOR... line once, yet it continues to compare the variable with the limit value. So where is it looking? At the stack, I assume. Another statement that TRACE apparently ignores is DATA. A program will contentedly read DATA 'till the cows come home yet TRACE seems to deny it...Hmmm.

One TI module has been getting under my skin for a long time now. What can you do with an Adventure module, except play adventures on it? It contains goodies like a true lower-case character set, underline cursor and, apparently, DISPLAY AT. I've tried, somewhat casually I admit, to get at these facilities via TI BASIC, using the same methods that draw forth Enhanced BASIC from the PRK and Stats modules but with no success. Perhaps some accomplished PEEKer could have a look.

Computer & Video Games magazine added a footnote to a letter they published some time ago, pledging continued support for the TI. They then ran about four issues without mentioning the thing at all... apparently they promise some TI games reviews in the next issue; I'll believe it when I see it.

Keep an eye open for British Telecom's new office terminal/computer/work-station/anything-else-they-can-think-of, known as TONTO. Does the name stand for anything or was the designer simply a Lone Ranger freak? A brief (very!) inspection showed a most interesting specification at a very reasonable price, but why oh why did they choose Sinclair-type micro-drives instead of a floppy disk system for data and program storage?

Happy computing,

Graham Baldwin

32, Ellesmere Drive, South Croydon, Surrey. CR2 9EJ Tel 01-651 0657

ED: Computer and Video Games published a TEXAS REVIEWS SPECIAL in the June issue. No less than THREE WHOLE PAGES with over dozen reviews. Dennis Hemmings said CVG will continue to support TI99/4a.

WATCH OUT FOR FUTURE ISSUES OF C&VG

TIGEBRUIKERS HOLLAND
DOUBLE DUTCH OR DUTCH DOUBLE?

by ED: C & A

Just prior to our planned holiday to Holland, to tiptoe through the tulips, we received a letter from the President of the Dutch Users group, TIgebruikers, Evert Smies. This seemed too good an opportunity to miss so called him and were invited to meet him at his home in Haarlam, just outside Amsterdam.

Evert and his wife made us most welcome and we spent an enjovable evening with them. Their national group is run by a committee and produces a newsletter every two months called "TIjdingen", which many of you may recognise as Dutch for TIDINGS. Each issue contains some 40 pages of articles, reviews, programs etc which look extremely interesting and had us rushing for our Dutch-English dictionary. There are some 1400 members of the group scattered throughout the Netherlands and they hold meetings twice a year in Utrect.

Evert explained that there were two TI groups in Holland but only one "official group". The second and original group is run by a businessman, Albert Visser,in Rotterdam. This is known as TIgebruikers and also produces a bi-monthly magazine "TIjdingen". Confused? Well the split from the original group took place due to national restrictions that separate clubs and commercial enterprises.

As we were on tour of Holland we called on Albert Visser. It was a pleasant suprise to find that not only does Albert produce a quality magazine for the TI but is also the only main dealer of TI hardware in Holland and Belgium. He had begun to supply goods when they began to get scarce and also to subsidise the cost of producing the magazine. The magazine is similar in style and content to the first Parco magazine and there are 2400 subscribers who also have the benefit of a software library.

And why two TIjdingen ? Well Albert originated the name, with a little inspiration from over the Channel, and you know what it's like, when you have a good idea-everyone wants it. How many other worldwide user groups now have a TI*MES newsletter I wonder?

Clearly the groups compliment each other and both are working towards the common aim of helping and supporting the TI user. We were left with the impression that Dutch TI users were fortunate in having two quality publications for their computer. Many thanks to both groups for their hospitality, and for donating a number of programs, including the BASICODE translater, to the UK group library.

ADDRESSES:

TI-GEBRUIKERSGROEP (official),c/o Evert Smies,2036 HN HAARLEM, Meiendel 13,Holland.

TI gebruikers,Albert Visser, Haagweg 169,2281 AJ RIJSWIJK, Holland.

RAMBLES

by Stephen Shaw

Hello and welcome to another RAMBLES.

You may have noticed in Issue 8 that only one LOGO book was reviewed although two were mentioned in the text! Sorry about that, but for the second issue running Clive took the scissors to the second review. Well, I am going to put it at the BEGINNING of this months article

LOGO by Anne Sparrowhawk. PAN PCN LANGUAGE LIBRARY.
170 pages. #5,95
A book about LOGO with NO mention of TI????? Hmmm.
Based on LCSI LOGO, most users will be able to transfer the contents to their own TI LOGO. Lots of procedures. Very interesting procedures too...
How about: TO CALL

```
PR [WHAT IS YOUR SHAPE CALLED?]
MAKE "TITLE READWORD
MAKE "STRING []
SINGLEKEY
MAKE THING "TITLE :STRING
END
```

That is on page 39, and is part of a suite for under 6's. NOT TI Logo admittedly... but can you follow it? With the book you should find conversion easier than with this tiny example.

And how about a 'large character' set! This suite occupies ten pages of the book... I haven't tried it yet so I don't know if WE have room for it! But it will illustrate the books depth.
Very good reading and if you have Logo, well worth reading, even if you have not yet USED your logo..it may well inspire you to more worthy things!

!!!

If you do not use your mini mem for program or data storage, you will not notice the battery becoming flat... so do check the date on the module!

Thanks to Pete Brooks for reminding me that you can define columns using RS with TI Writer. I have also rediscovered that you can output to disk using the FORMATTER option:- it adds a line feed to the end of every line.

I have also discovered that my printer (FX80) allows the hash and pound sign to be co resident: I can tell the printer to print a pound sign whenever a CHR$(6) is sent by sending ESC I 1 [CHR$(27);"I1"]
To send a CHR$(6) from the TI Writer Editor, you press CTRL & U to obtain the underline cursor, then press SHIFT and F . Press CTRL and U again to return to the normal cursor. Thus I can leave the printer printing ####'s which is mighty handy for listings, but print a pound symbol in my letters and so on with no difficulty at all.

Memo to Ian Swales: in the UK the VDP interupts are every 50th of a second, not every 60th of a second as in the NTSC model.

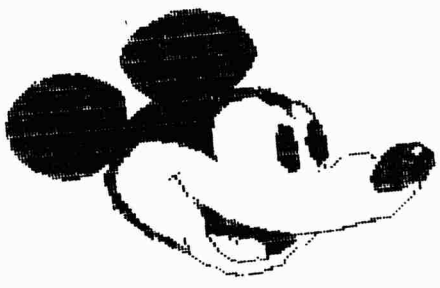
Congratulations Graham Baldwin on ROLLERBALL published recently. Hope too many TI owners were not put off by the SPECTRUM banner which headed the program (these magazines!).

The video output socket shown on page 26 of issue 8 is great for our US friends, but PAL models use a SIX pin DIN plug, not the NTSC five pin DIN plug!! A previous issue of TI*MES has given details of connecting a metal boxed TI modulator to the COMPOSITE VIDEO input of a video recorder or monitor - for full colour too.

FORTH UPDATE:
MPE in Southampton do a lot of FORTH advertising so I sent for a catalogue. After several months one arrived: 16 pages of A4, and I could not follow a word of it. If you would like to buy floating point routines for the Z80 for slightly under one hundred pounds, fine. TI have provided them to us as standard! Waste of a postage stamp as far as I was concerned.

Some SPRITE definitions were revised in 1983. Use your main system disk to look at screens 58 and 59: use 58 LIST then 59 LIST.
Look at the dates at the top of the page. What year? If 1982, you need to make the following amendments:
Type 58 EDIT. Change line 10 (part of SSDT definition):
  formerly: ... 80 0 VFILL ENDIF
  to become:... 80 0 VFILL 300 ! SATR ! ENDIF
Use FCTN 9 [back] and when back at the bottom of the screen (having removed the disk write protect tab!) type FLUSH.

Type 59 EDIT, and make amendments as follows:
 Line 7 (part of SPRITE definition)
    formerly .... I 2 VMBW ENDIF ....
    to become: .. I 2 VMBW DROP ENDIF ....
 Line 9 (part of MOTION definition:)
    Formerly: ... + >R 100 U* DROP + SP@ ...
    to become: .. + >R 8 SLA SWAP 00FF AND OR SP@ ...
Use BACK and FLUSH to disk.



To be really efficient, you may wish to change the dates on the screen from 1982 to 20OCT83!!!

DISASSEMBLING: What it looks like:

NB: this is NOT a genuine program, but the syntax is correct!

ORIGINAL SOURCE:

```
       AORG >A000
TISUB  EQU  >2D14
GETTIM EQU  >282C
WS     EQU  >3ADC
KEY    EQU  >253D
STRREF EQU  >2014
STRAS  EQU  >2110
DONE   EQU  >2C08
       BLWP @TISUB
       BLWP @GETTIM
       DATA 2,WS

       INC  R0
       LI   R1,1
       MOV  R8,R2
```

DISASSEMBLED OBJECT CODE using Navarone Super Bug

```
A000  BLWP @>2D14
A004  BLWP @>282C
A008  DATA >0002
A00A  MPY  *R12,B
A00C  INC  R00
A00E  LI   R01,>0001
A012  MOV  R08,R02
```

and so on.

Notice: Labels exist only for your original source code. They do not exist in the object code and so cannot be recovered. Whatever the address of the label is, that address will be used in the disassembled listing.

DATA has been 'translated' into an inapplicable operand. You need to look at an ASCII dump and to have some slight idea of what is going on! TEXT is also mistranslated into strange commands.

A dissasembler CAN be useful, but it does not give you the source code as originally keyed in! If you have been thinking of obtaining a dissassembler, maybe this note has helped you see what one can do!

SXB UPDATE: Further to my review in issue 8, I now have the first 17 issues of SXBrief, and the disk of code relating to the first 15 issues, which also includes two screen dump programs and a disk cataloguer. As I said last time, an expensive package on its own, but the extras are very reasonably priced and together they provide excellent value.

An example of my use of SXB, to sort names alphabetically:

```
 100 CALL CLEAR
 110 DIM A$(60)
 120 FOR T=1 TO 60
 130 INPUT:"INITIALS etc":B$
 135 IF B$="END" THEN 200
 140 INPUT "SORTING NAME":C$
 150 CALL LINK("SMFIX",B$,10)
 160 A$(T)=B$&C$
 170 NEXT T
 200 DES$=CHR$(30)&CHR$(11)&CHR$(2)
 210 CALL LINK("DBKEYS",DES$,V)
 215 CALL LINK("DBSORT",A$(),VEC)
 220 OPEN #1:"PIO"
 230 FOR T=1 TO 60
 240 B$=SEG$(A$(T),1,10)
 250 C$=SEG$(A$(T),11,LEN(A$(T))-10)
 260 CALL LINK("SMTRIM",B$," ")
 265 IF B$="" THEN O$=C$ :: GOTO 280
 270 O$=B$&" "&C$
 280 PRINT #1:O$
 290 NEXT T
 300 END
```

```
Α = ALPHA   : 0000344848484834
Β = BETA    : 0038445858447840
Γ = GAMMA   : 0000645810101010
Δ = DELTA   : 0038201028484830
Ε = EPSILON : 000001C201020201C
Ζ = ZETA    : 0020182040201020
Η = ETA     : 0058242424240404
Θ = THETA   : 0030484878484830
Ι = IOTA    : 0000101010101008
Κ = KAPPA   : 0000485060504848
Λ = LAMBDA  : 0000201010284440
Μ = MU      : 0000484848784440
Ν = NU      : 0000482828283022
Ξ = XI      : 0030403040201008
Ο = OMICRON : 0000384444444438
Π = PI      : 00007C2828282828
Ρ = RHO     : 0030484870404020
Σ = SIGMA   : 0000344848484830
Τ = TAU     : 0000307C501010100
Υ = UPSILON : 0000444444444830
Φ = PHI     : 0010385454543810
Χ = KHI     : 0000641810102840
Ψ = PSI     : 0010929292541010
Ω = OMEGA   : 0000444454545428
```

3.

BOOK REVIEW: FUNDAMENTALS OF TI99/4A ASSEMBLY LANGUAGE
Published by TAB, 310 pages, paperback, under twelve pounds.
Author: M S Morley ISBN:0 8306 1722 1

By far and away the BEST machine code book for the absolute novice, and at a very fair price too. Based on the mini memory so you don't need the full system expansion to profit. Written in a very friendly manner, this book will teach you the FUNDAMENTALS of 9900 machine code, and has many examples for you to enter. Does NOT cover more complex issues such as sprites or sound: but after reading this book, you will be ready for the slightly more meaty books which are available. An excellent book. Vote of thanks to Ray Kazmer who kindly sent me a copy. You will be able to obtain it from any good bookshop, to order.

BOOK REVIEW: FORTH TECHNIQUES. by R Olney & M Benson. PAN BOOKS. paperback. 253 pages, around seven pounds. ISBN 0 330 28961 6

This is the second PAN book on Forth. The first 'primer' is FUNDAMENTAL FORTH by the same authors. This book goes a bit beyond primers... and looks at ways of "extending your system". General Forth programming techniques are explored through useful example routines. Quite a few of the extensions are 'standard' in TI Forth, and the chapter on controlling hardware is not exactly relevant, but this book does give you a very good deep look into the possibilities of Forth, and the examples of Forth programming, even if not directly relevant, are still educational. A good third book to buy, after Brodie and Scanlon.

~~~
~~~

DISK SECTOR ACCESS

FROM BASIC

At long long last, the promised land...

This somewhat technical subject will start off with a practical working example of disk sector access in TI Basic, and requires the Mini Memory module.

Notes follow after program!!!

This program requires the mini memory and a BLANK initialised disk. It will use disk sectors 21 to 24. It DOES NOT use file names and the disk manager will not show the files as used.

Later a more general program will be given together with amendments for Editor/Assembler and Extended Basic.

```
50 REM   DISK SECTOR ACCESS
    DEMO
60 REM  FOR MINI MEMORY
70 REM
80 REM  DUMP SCREEN CONTENTS
    TO DISK THEN READ THEM

90 REM
100 CALL CLEAR
110 CALL INIT
120 PRINT "STARTING......"
129 REM  D=DISK DRIVE NUMBER

130 D=1
139 REM  S=BASE SECTOR
140 S=20
149 REM  B=BASE NUMBER FOR
    BUFFER ADDRESS
150 B=-256
158 REM  C=0 MEANS WRITE
159 REM  C=255 MEANS READ
160 C=0
169 REM  LETS DUMP FIRST K
   OF VDP, EG SCREEN PLUS
   COLOR TABLE
170 FOR T=0 TO 3
171 CALL HCHAR(1+T*6,1,42+T*
8,192)
172 CALL VCHAR(1,1+T*6,65+T*
8,48)
180 NEXT T
190 FOR T=0 TO 3
200 GOSUB 240
210 NEXT T
220 PRINT "NOW CHANGE LINE
 160 TO    C=255 AND RUN PRO
GRAM AGAIN":"":"USE CLEAR (B
REAK)"
221 PRINT "ALSO BYPASS 171 B
Y INSERTINGLINE 171: GOTO 20
0":"AND ADD LINE 219: GOTO 2
19"
230 GOTO 230
240 IF S>20 THEN 260
248 REM  14700 IN DISK AREA
     HENCE SAFE. POINTED TO
    BY LAST TWO BYTES IN
249 REM  LINE 330. COULD BE
  ANY VDP ADDRESS.
250 CALL POKEV(14700,1,16)
259 REM  INCREMENT SECTOR
     AND CONVERT TO TWO BYTE
     FORMAT
260 S=S+1
270 S2=-1*(S>255)
280 S1=S+256*(S>255)
289 REM  INCREMENT BUFFER
  ADDRESS AND CONVERT TO TWO
  BYTE FORMAT (A DIFFERENT
  WAY!)
290 B=B+256
300 B2=INT(B/256)
310 B1=B-(B2*256)
319 REM  NO NEED TO RELOAD
  WHOLE ROUTINE ON SECOND
  AND SUBSEQUENT PASSES...
320 IF S>21 THEN 360
327 REM
328 REM  D=DISK C=READ/WRITE
     B2,B1=BUFFER ADDRESS
     S2,S1=SECTOR NUMBER
329 REM   LAST TWO BYTES POI
NT TO ADDRESS IN LINE 250
330 CALL LOAD(32000,131,76,0
,6,D,C,B2,B1,S2,S1,0,0,0,0,5
7,108)
339 REM  THE ACTUAL M/C
     ROUTINE:
340 CALL LOAD(32016,2,0,125,
0,192,112,192,176,204,112,6,
2,22,253,4,32,96,56,0,10,4,9
1)
348 REM  LETS GIVE THE
  ROUTINE A NAME...  32760 I
S REF/DEF FOR MINI MEM.
349 REM  FIRST 6 BYTES= NAME
, LAST TWO= ENTRY POINT
   (125*256 +16 =32016)
350 CALL LOAD(32760,84,73,42
,77,69,83,125,16)
360 IF S=21 THEN 390
369 REM  CHANGE BUFFER AND
    SECTOR INFO ONLY:
370 CALL LOAD(32006,B2,B1,S2
,S1)
380 GOTO 400
389 REM  POINTER TO 32760:
390 CALL LOAD(28702,127,248)
400 CALL LINK("TI*MES")
410 RETURN
420 END
```

NOTES FOLLOW.....>

This is a working program, and is printed here directly after proving by testing! If you encounter any problems, ensure that all the numbers in the CALL LOAD lines are right!

The preceding program dumps the screen display to disk. A few minor changes, as shown in the program, and the program will read that data back in, fairly quickly. I have here saved the first 1k of VDP (4 sectors) which includes the screen and colour info but not character definitions: you need to save at least another two sectors to store the characters as well.

2022 note: Extended Basic- XB does not have a DSRlink we can use so we need to add one- please see Issue 10 for amendments required for Extended Basic!!!

GENERAL PURPOSE DISK UTILITY

1. For MINI MEMORY:

2. For Ed/As and Ex/Bas the main changes relate to the ref/def tables and the actual m/c routine being in different locations!

```
100 CALL CLEAR
110 CALL INIT
120 PRINT "DISK UTILITY"
130 CALL POKEV(14700,1,16)    >>>>>>>.Delete line 130 for ExBas. As is for Ed/As
140 INPUT "DISK NO:":D
150 INPUT "SECTOR NO:":S
160 S2=-1*(S>255)
170 S1=S+256*(S>255)
180 PRINT "ENTER":"1.TO READ
":"2.TO WRITE"
190 INPUT C
200 C=-255*(C=1)
210 PRINT "RECOMMENDED BUFFE
R AREA":"14800 & OVER"
220 INPUT "BUFFER ADDRESS:":
B
230 B2=INT(B/256)
240 B1=B-(B2*256)
250 CALL LOAD(32000,131,76,0  >>>>>.ED/AS: Use 12288 instead of 32000
,6,D,C,B2,B1,S2,S1,0,0,0,0,5        Ex Bas: Use 15360 instead of 32000
7,108)
260 CALL LOAD(32016,2,0,125,  >>>>>.Rewritten for Ed/As and Ex/Bas  ...
0,192,112,192,176,204,112,6,                                    see below
2,22,253,4,32,96,56,0,10,4,9
1)
270 CALL LOAD(32760,84,73,42  >>>>>.see below
,77,69,83,125,16)
280 CALL LOAD(28702,127,248)  >>>>>.see below
290 CALL LINK("TI*MES")
300 STOP
```

```
.............................
MAJOR CHANGES:
LINE 260:
Ed/As: CALL LOAD(12304,2,0,48,0,192,112,192,176,204,112,6,2,22,253,4,32,33,32,0
,10,4,91)
EXT BAS: CALL LOAD(15436,2,12,17,0,29,0,6,160,91,56,16,0,30,0,4,192,216,0,131,1
24,194,224,60,16,4,91)

Line 270:
Ed/As: CALL LOAD(16168,84,73,42,77,69,83,48,16)
Ex Bas:CALL LOAD(16376,84,73,42,77,69,83,60,50)

Line 280:
Ed/As: CALL LOAD(8234,63,40)
Ext Bas: CALL LOAD(28702,127,248)

NB: REF/DEF addresses used all assume that no other machine code routine or
program is resident!
```


I am indebted for this information (especially for the m/c routines) to Richard Blanden.

RAMBLES ON FORTH

(Part one in TI*MES issue 8)

Now, you have a copy of FORTH in BSAVE format, which loads quickly! We did not correctly use BSAVE, as it adds a value to the stack, which we failed to clear (!). That value was the next vacant screen on the disk.
Our fairly full Forth BSAVE took up from screen 51 to screen 61.
The following screens cannot then be used for our programs:

[2022: Reserved screens: 0-20 and 51-61]

```
 0/5 : Used by the system
  44 : TRACE ( not Bsaved. You may want to load it later)
51/61 : Our Bsaved area!
68/71 : FILE ( not Bsaved. May wish to use it later)
74/75 : Code and Assembler. as file above.
  88 : CRU (as above)
```

If you have loaded EDITOR into the Bsaved portion, you may wish to retain the 64Support on your disk: it is on screens 22 to 29
If you have used 64Support in your Bsaved version, then you may wish to retain the 40 column EDITOR which is on screens 34 to 38.

ALL other screens are in the Bsaved portion. You may therefore use them to save your programs to. You may also wish to set up a disk especially for your programs, with nothing of the Forth language on it. This is ideal for two disk drive owners who can keep the System disk in Drive 1 and the program disk in drive 2.

If you wish to set up a blank disk with empty FORTH screens, to hold your programs, place it in drive 1 and enter: 0 FORMAT-DISK
Also, copy the error messages, screens 4 & 5. If you have two drives you could use SCOPY or SMOVE. If you only have one drive, the simplest way to copy them is to load eg screen 4: 4 EDIT then add your initials to line 14 and FLUSH to the new disk. Repeat for screen 5.

To enter a program onto a Forth screen, if you wish to use say Screen 15, type:
15 CLEAR 15 EDIT
If the disk is in drive two, the position of screen 15 is now called Screen 105!!! (eg add 90). FORTH only uses the disk number for the FORMAT command. When accessing screens you do so only by screen number. Disk one is 0-89, Disk two contains 90- .

Now, lets try to key in a simple screen to demonstrate writing, saving, loading and running a FORTH program.

I have selected the MULTICOLOUR mode to demonstrate: my TI Forth manual gives an incorrect definition of one of the words used!

Decide which screen you wish to save the program to, then key in:
N CLEAR N EDIT where N is your selected screen number!

Enter the screen shown on the next page, exactly as shown. When you have finished, press FCTN and 9 [BACK] and then enter FLUSH to write the screen to your disk.

The screen has been written to auto run, by using a defined word on the screen. To load the screen, key in N LOAD where N is the number of the screen.

The word we had difficulty with is MCHAR. According to my TI Forth manual, this word uses a 24 x 32 screen, sets four blocks of colour, and takes six values from the stack. It doesn't, not on my Forth!
It takes three values from the stack, N1 N2 N3, where N1 is the colour (0 to 15), N2 is the column (0 to 63), N3 is the row (0 to 48).
If anyone has a TI Forth Manual which describes MCHAR in this manner, or has a copy of TI Forth which needs six values to run, please let me know!!!!

```
SCR #18
  0 ( NEIL LAWSON MULTICOLOUR DEMO)
  1 : STT MULTI MINIT RANDOMIZE DECIMAL ;
  2
  3 : PRT 16 RND 64 RND 48 RND MCHAR ;
  4 : PTN 3000 0 DO PRT LOOP ;
  5
  6
  7 : S 64 0 DO
  8     48 0 DO 16 RND J I MCHAR LOOP
  9                                LOOP ;
 10 : MCP STT S PTN TEXT ;
 11 MCP   TEXT  CLS
 12 ." ENTER 'MCP' TO DO AGAIN"
 13
 14
 15
```

..... description:

LINE 0: DESCRIPTION. Words in brackets are REMS. Leave a space after open bracket. Line 0 of each screen can be inspected using the INDEX command, useful for finding screens! (eg 1 89 INDEX)

Line 1: Sets up multicolour mode, places random seed and tells computer any numbers it may meet are in decimal base.

Line 3: PRT switches on a random block in a random colour.
16 RND gives a random colour from 0 to 15 and so on.

Line 4: Simple loop to switch on 3000 blocks at random.
DO...LOOP is equivalent to FOR...NEXT.
In this case:
```
FOR I=0 TO 3000
switch block on
NEXT I
```

Line 7: Leaving the computer to switch on random blocks left big chunks of black for rather a long time, so I decided to switch every block on first, then vary the colours randomly. S is a Nested Loop! and is equivalent to:

```
FOR COLUMN = 0 TO 63
FOR ROW = 0 TO 47
COLOUR = INT(RND*16)
set block: colour, column, row
NEXT ROW
NEXT COLUMN
```

To use the value of the loop counter, we use I & J.
I is used for the innermost loop, and J for the second innermost loop.
Using I & J places the relevant value on the stack where we can use it.

The count starts with the value on the top of the stack when DO is reached (zero in these cases). When LOOP is reached, the counter is increased by one. If it then equals or exceeds the next value on the stack (64, 48), that is the end of the command. This differs from Basic, which increments the counter, goes through the loop and THEN tests for the maximum value. In FORTH the maximum value is not used in the loop.

Line 10 defines the word which makes it all happen ... notice we switch back to TEXT mode afterwards!

Line 11 is an auto start : the computer will perform MCP as soon as you LOAD the screen. After the first run, it switches back to TEXT mode, clears the screen, and reminds you of the command word.

. [stop] is PRINT & . " text" is PRINT "text"
Note the space after the opening quotation mark!

For the next issue we will have some FORTH screens to give you Speech and CALL SOUND with Forth. How would you like RAMBLES to carry on with Forth? Equivalents of Basic commands? Particular problems? You write and I'll try to answer:

SAE for a direct reply! Stephen Shaw
10 Alstone Road STOCKPORT Cheshire SK4 5AH

==========

Still waiting for the first copy of the user group magazine from forth Interest Group UK.
MICROpendium is arriving regularly and full of interest. UK subs are now:
US$21.50 surface, US$28.50 air.
MICROpendium P O Box 1343 Round Rock TX USA 78680

Craig Miller is described as "formerly an executive with CorComp"

What does NEW do? Load a program with ExBas and 32k ram. Now key in:
CALL INIT :: CALL PEEK(-31868,A,B,C,D) :: CALL PEEK(-31952,E,F,G,H)
and of course PRINT A;B;C;D;E;F;G;H -write these value down
Now key in NEW. Is the program still there?
Key in (using those written down values!!!):
CALL LOAD(-31868,A,B,C,D) :: CALL LOAD(-31952,E,F,G,H)
Now...LIST!
NB: One line of the program will be corrupted... the 'oldest' line to be entered.

QUICKIES:
Computer Art and Animation A Users Guide to TI99/4A COLOR LOGO by D D Thornburg. Addison-Wesley. ISBN 0-201-07958-5 pb 214pp
Around twelve pounds.
With LOGO receiving such little attention a book is very nice... especially when it is for the TI! This book sets out to deal with only a particular aspect of LOGO: Art! It concentrates heavily on the Turtle, with a mere 18 pages on the use of sprites. It is an easy read, with lots of mainly blank pages! Not in the least intimidating, and a fresh outlook is always welcome.

BASIC REFERENCE MANUAL, SAMS from Clive when available...
Super little book, why didn't I have it in 1981? ('cos it was written in 1984!). Deals mainly with TI Basic and goes into some detail on each command with lots of examples. I did miss a good example of the POWER of the POS function (I suspect only Pete Brooks knows about it!) but logical operators are well covered. Excellent detail, good appendices. Recommend.

SCREEN DUMP PROGRAMS:
Dataflex (DFX) from Arcade: Dumps from Basic using CALL LINK or interrupt driven key scans or interrupt switch. from Modules INC SUPER SKETCH with interrupt switch. Dumps and saves to disk too. Good buy.
DFX works with most printers and RS232 or PIO.
DUMP freeware from S Shaw: Dumps from Basic using CALL LINK or interrupt switch (no key scanning) or from most modules with interrupt switch. (NOT super sketch). Prints horizontally or vertically, single or double size, optional invert. Does not dump to disk. Good Value (Just send me a blank INITIALISED disk with return post and packing.). Set up for PIO but source code is supplied if you want something else. You'll need Ed/As to amend the printer!!!
AMERISOFT screen dump: for Super Sketch ONLY but uses the modules own menu, no extra switches required. Dumps in 8 shades of grey to try to show the colours. You either like it or you don't!!! US$30 in the States.

Want a 99/4A? Manorgrove in Manchester have one for just 100.00 or perhaps an Atari 400 for 270.00? or a faulty and unguaranteed Oric for 70.00? Manorgrove are not some small outfit, they are part of a chain of stores, owned by GRATTAN WAREHOUSES, the big mail order people!!

VDP-REGISTERS

by Stephen Shaw

This rather strange title heads an article on the use of the seven VDP Registers.
The article is aimed squarely at owners with Mini Memory, but is of use to anyone interested in machine code or even Forth.
A short machine code utility would enable owners with ExBas and 32k ram to also use these registers by means of CALL LINK to load the registers.

Even if you lack any of these extras, the article may be of interest in revealing a little of the consoles internal working.

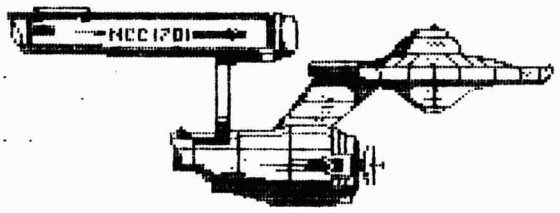
VDP is short VISUAL DISPLAY PROCESSOR, a TI first: a separate computer chip which does all the display work. On the 99/4A the chip is also made to pass Basic program data to the main processor. Widely used (for instance in the MSX machines) the VDP Processor is the most costly integrated circuit in your console, currently costing some £15.00.

The VDP Registers hold information which controls the essential workings of the VDP... and I shall start with a look at the first register!
Not all the registers will be dealt with in such detail, but there is a summary at the end.

SCREEN BLANK

VDP REGISTER ONE is a multipurpose register, controlling several different aspects of console operation. By changing the value in this register we can adjust:
4/16k selection! ; Screen blank ; VDP Interrupt switch;
graphics modes; sprite sizes.

The basic address of vdp register one is -32512
To this is added the value of each of 8 control bits.
The normal value is 224:
Bit 0, value 128 = 16k selected
Bit 1, value 64 = screen enabled
Bit 2, value 32 = interrupts enabled
Bit 3, value 0 = NOT 40 column text mode
Bit 4, value 0 = NOT multicolour mode
Bit 5, value 0 = Has to be a zero here
Bit 6, value 0 = standard sized sprites
Bit 7, value 0 = unmagnified sprites
TOTAL:224



(Bit 7 has a value of 0 or 1,
Bit 6 has a value of 0 or 2,
Bit 5 has a value of 0 or 4,
Bit 4 has a value of 0 or 8 and so on...)

REFERENCE: Editor Assembler Manual Pages 326/327

Adding the value of each bit we get 224.
To set the register to this value we use CALL PEEKV with mini memory.

EXAMPLE:
In your program insert: CALL PEEKV(-32352,A)

Now, the screen can be set up with any text or graphics and the viewer will see only a blank screen (unless he presses a key!).

continued.....>
5

You can instantly switch the screen back on with:
CALL PEEKV(-32288, A)

Look at the normal bit settings above: to turn the screen off, we need to turn the value of bit 1 to 0, that is subtract 64 from the normal register value. We need to change the value to 160.
We do this by adding 160 to the basic address of register one:
-32512 +160 = -32352 !!!

Now experiment with other settings of register 1.
NB: If you disable the interrupts, you switch off the key scans etc & end up with a 'hung-up' console
Try to use different sized TI BASIC sprites!!

~~~~~~

Intermission.....

In a February copy of Home Computing Weekly, K J Macaulay on the remote Isle of Lewis wrote to complain of Mike Curtis describing Pole Position on the Spectrum as follows: "I have seen better games for the TI99/4A". Mr Macaulay took some exception to this comment!
Mike Curtis is no stranger to the 4A, indeed he is the author of a very playable program in Extended Basic, which received a five star review in Home Computing Weekly: Q Bono (now £5.00 from Stainless Software). Despite the very good review, sales have been hopelessly small, certainly nothing to encourage Mike to stick with his TI. Mike HAS seen better games on the TI: he wrote an excellent one himself!

TI*MES USER LIBRARY: DE BUG: DIS/ASS PROGRAM:
Tony McGovern in Australia sends the following improvements to the dis/ass program:

```
 Add: 3115 IF E>1919 THEN 2220
 Add: 3525 IF (V<>768)*(V>736) THEN 2220
AMEND:2560 T=VAL(SEG$(NYB$,3,1))
```

Line 3115 catches some undefined op codes
Line 3525 gives better data discrimination

::

Andrew Lord contacted me a while back. He had obtained VERY cheaply a 35 track disk drive made by Tandy many years ago! His TI worked OK with it to the extent that the disk would format, but the testing following formatting failed.
I suggested that the head seek speed was too slow, and by some means Andrew managed to make it move faster: fast enough to work properly with his TI.
Richard Blanden has suggested that with only minor modifications most 40 track drives should function with the TI. However please do not write to ask me what modifications are required for what drive!!! Suffice to say that if you can find a knowledgeable disk drive mechanic, it should be possible!

++

MICROpendium, mentioned briefly in issue seven is "the only monthly devoted to the 99/4A", an American magazine running to 40 pages of newsprint, full of ads and reviews relating to the 4A. The January 1985 issue contained a one screen Bubble Sort in Forth, but there are only a few shortish listings.
I have taken out a subscription and will be reporting further in the next issue (maybe even a bit more later on) but for the enterprising, prepared to take a risk, the UK sub is US$21.50 seamail, US$28.50 airmail, for 12 issues.
MICROpendium, P O Box 1343, Round Rock, Texas, USA, 78680

Now back to VDP registers, Register Two next.....
~~~~~~

VDP REGISTER 2

This little program is pretty impressive and uses VDP register 2 to build up an alternative display which can be instantly recalled.

It is necessary to reserve an area of memory for the second display: see the initial rem statements.

When RUN, an initial design of horizontal bars will appear, and will shortly be followed by a blank screen. When the second design appears, press SPACE for a quick demonstration!

```
1 REM  USING VDP REGISTER
2 REM  TO INSTANTLY CHANGE
3 REM  SCREEN DISPLAY
4 REM  ~~~~~~~~~~~~~~~~~~~
5 REM  BEFORE KEYING IN OR
6 REM  LOADING THIS PROGRAM
7 REM  RESERVE MEMORY:
8 REM  IF YOU HAVE A DISK
9 REM  SYSTEM, USE
10 REM  CALL FILES(8), THEN
11 REM  NEW
12 REM  ELSE KEY IN
13 REM  CALL LOAD(-31888,56,
0) THEN KEY IN NEW THEN LOAD
14 REM  ~~~~~~~~~~~~~~~~~~~~
100 CALL CLEAR
110 PRINT "WAIT A FEW MINUTE
S WHILE THETWO SCREENS ARE S
ET UP":::
120 FOR T=0 TO 5
130 CALL COLOR(T+9,T+2,T+2)
140 CALL HCHAR(1+T*4,1,96+T*
8,128)
150 NEXT T

151 REM  NOW TRANSFER TO
     2ND SCREEN AREA:
160 FOR Z=1 TO 768 STEP 24
170 CALL PEEKV(Z,A,B,C,D,E,F
,G,H,I,J,K,L,M,N,O,P,Q,R,S,T
,U,V,W,X)
180 CALL POKEV(Z+14336,A,B,C
,D,E,F,G,H,I,J,K,L,M,N,O,P,Q
,R,S,T,U,V,W,X)
190 NEXT Z

191 REM  BLANK SCREEN BEFORE
 PLACING TEXT
200 CALL PEEKV(-32352,A)
210 PRINT "PRESS SPACE FOR N
EXT SCREEN"

211 REM  AND TRANSFER TEXT T
O BOTTOM OF 2ND SCREEN
220 FOR @=705 TO 768 STEP 32
221 REM  NOTE USE OF @ AS A
  VARIABLE!
230 CALL PEEKV(@,A,B,C,D,E,F
,G,H,I,J,K,L,M,N,O,P,Q,R,S,T
,U,V,W,X,Y,Z,AA,BB,CC,DD,EE,
FF)
240 CALL POKEV(@+14336,A,B,C
,D,E,F,G,H,I,J,K,L,M,N,O,P,Q
,R,S,T,U,V,W,X,Y,Z,AA,BB,CC,
DD,EE,FF)
250 NEXT @
260 CALL CLEAR

261 REM  CLEAR SCREEN AND
  SWITCH DISPLAY BACK ON...
270 CALL PEEKV(-32288,A)
280 PRINT "SECOND SCREEN BEI
NG BUILT.."
290 FOR T=0 TO 5
300 CALL VCHAR(1,1+T*5,96+T*
8,120)
310 NEXT T
320 PRINT "PRESS SPACE FOR N
EXT SCREEN"
330 CALL KEY(3,A,B)
340 IF A<>32 THEN 330

341 REM  A SIMPLE PEEKV WILL
 CHANGE TO SCREEN TWO:
 INSTANTLY!!
350 CALL PEEKV(-32242,A)
360 CALL KEY(3,A,B)
370 IF A<>32 THEN 360
380 CALL PEEKV(-32256,A)
390 GOTO 330
400 END
```

If you glance at your Mini Memory Manual, you will see on page 75, that TI claim the 'standard' Sprite Attribute List is using VDP memory locations 768 to 895. There is therefore enough room for 32 sprites... or is there?

~~~~~~>
~~~~~~

In fact, TI have shown an incorrect start address for the pattern colour table, as the colours for the cursor and the edge of the screen are held in location 895. In order to use 32 sprites without spoiling the screen colour, we need to move the sprite attribute list.

This we are permitted to do. Page 327 of the Editor Assembler Manual refers. The address at which the Sprite Attribute List (henceforth: SAL) can be found is stored in VDP REGISTER 5.

The value of this register (which can only be written to, not read) can be amended in a TI BASIC program, using Mini Memory, by using CALL PEEKV.

That was not a misprint: we use PEEKV to WRITE to the register as follows: Each of the VDP registers has a basic memory value allocated to it. The value of the registers is changed by peek'ing a memory address which is offset from this basic value.

Example:
The basic address for VDP register 5 is -31488.
The normal SAL starts at address 768, which is 6 x 128.
Thus we can vary the SAL in units of 128: each offset=128.

To have 32 sprites on screen, we need 32x4=128 bytes of memory which will not be corrupted by the TI BASIC program. An apparently safe area can be found around VDP address 1536-> which is usually used to store the definitions of characters 97 onwards.

To move the SAL to start at 1536, we divide 1536 by 128: 1536/128 = 12.
We then add this offset to the basic address for register five:
-31488 + 12 = -31476

As you can see from the listing, to move the SAL we merely use:
CALL PEEKV(-31476,A) [The variable A is a dummy but necessary]

NB: There is no need to reserve memory for this program. (MINI MEMORY REQUIRED).

```
100 REM  MOVE SPRITE TABLE
110 CALL PEEKV(-31476,A)
120 REM
130 CALL CLEAR
140 PRINT "HOW MANY SPRITES DOES A":"TI99/4A HAVE?"
150 FOR RT=1 TO 120
160 FOR SP=0 TO 31
170 CALL POKEV(1536+SP*4,RT+3*SP,20+SP*5,159+SP,15)
180 NEXT SP
190 NEXT RT
200 GOTO 150
210 REM
220 REM  TO RESTORE SYSTEM
230 REM  KEY IN:
240 REM  CALL PEEKV(-31482,A)
250 END
```

This short program will produce 32 sprites, slowly moving down the screen.

We have seen how mini memory can be used to change two of the VDP registers to produce a usable effect.
All of the registers can be changed in the same way, and details can be found in the editor/assembler manual, pages 326/327.

REGISTER ZERO is a multi purpose register, only one bit of which has any relevance to the TI99/4A. This is used to select bit map mode. It does not seem to be of use from TI Basic.

REGISTER ONE is dealt with above.

REGISTER TWO defines the base address of the Screen Image Table.
If you reserve a chunk of VDP memory (either using CALL FILES if you have a disk drive, or CALL LOAD(-31888,A1,A2)if you don't) then you can set up a screen display (or displays) and just by one CALL PEEKV, instantly change the entire screen display.
See above for an example.
This register is switched in chunks of a full one k, 1024 bytes.
BASIC ADDRESS: -32256
NORMAL START ADDRESS: 0
Reset to normal: -32256 +1024*0 = CALL PEEKV(-32256,A)

REGISTER THREE is the base address of the colour table. You can instantly change the colours of every colour set by switching the base address of the color table. As above, you need to reserve memory, and place your alternative table into the reserved memory area, then switch into it, and out of it.
Basic Address: -32000
Normal Start Address: varies.
TI BASIC: 768, EX BAS: 2048, Machine code,Ed/As:896
Reset to TI Basic Normal: -32000 + (13 * 64) = CALL PEEKV(-31232,A)
(Multiplier is 64. The first address is the values for the colour of colour set number one.)

REGISTER FOUR: base address of the pattern descriptor table. In TI Basic, the register has a value of 0 and therefore points to the same area of memory as the screen: BUT: the screen occupies only 0 to 768. The pattern descriptor table is in chunks of 2k, and thus with a base of zero, the top is at 2048. In TI Basic, you will find the character patterns described from locations 1008 to 2040.
Thus, although the two tables occupy the same area of memory, they do not conflict. However, this does explain why you cannot define characters with ASCII values under 30 or over 143. There is not enough unused table.
This also explains why, when using Sprites with TI Basic and Mini Memory, you do not use the actual ASCII value, but a larger number, to point to the correct pattern description in the table: normally the console will calculate the offset for you, but using CALL POKEV in this way, we need to add the offset on for it.
Basic address: -31744 Multiplier:2048
eg -31744 +1 = CALL PEEKV(-31743,A) will locate table at 2048.
(NB: It will point to 2048 as start of table: it is up to YOU to actually place meaningful values in there!!!).

REGISTER FIVE: base address of sprite attribute list. Dealt with above.
Basic address: -31488
Multiplier: 128

NOTE: We are not given the opportunity to relocate the SPRITE VELOCITY TABLE.
The Sprite Velocity Table expects to find the Sprite Attribute List at 768, and automatic motion of sprites is not possible unless the SAL is found in this 'normal' position.

REGISTER SIX: base address of the SPRITE DESCRIPTOR TABLE.
In Extended Basic (& TI Basic with Mini Mem) the Sprite Descriptor Table uses the SAME memory area as character descriptions. This enables us to give the ASCII value of a charactor to indicate what we want our sprite to look like. However, when using machine code, this table can be relocated which enables us to use 32 sprites which do not look like any of the definable characters.
The BASIC ADDRESS is -31232
Multiplier: 2048

REGISTER SEVEN: a dual purpose register. Bits 0 to 3 carry the colour code of the foreground colour when using the 40 column text mode, while bits 4 to 7 carry the colour code for the SCREEN.
Of little value from Basic.
Basic address is -30976
The default value of the register is >F5 (245) when using the Editor Assembler, but with TI BASIC or Extended Basic, the register has a normal value of >07 (Decimal 7, Binary 00000111). This value of 7 equates to a COLOR CODE of 8, Cyan.
The editor assembler manual incorrectly gives a Basic default value of >17

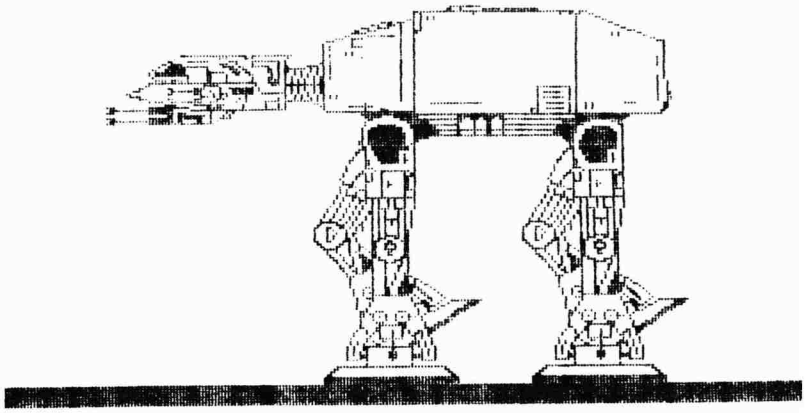
^^^

LOGO

A simple procedure, based upon a Logo procedure published in PCW:

```
TO TREE :SIZE :ANGLE :LEVEL
IF :LEVEL = 0 THEN STOP
LEFT :ANGLE
FORWARD :SIZE * 2
TREE :SIZE :ANGLE :LEVEL - 1
BACK :SIZE * 2
RIGHT 2 * :ANGLE
FORWARD :SIZE
TREE :SIZE :ANGLE :LEVEL - 1
BACK :SIZE
LEFT :ANGLE
END

TO WILLOW
TELL TURTLE
PENUP
BACK 24
PENDOWN
TREE 8 15 8
BACK 24
END
```



NOW key in *WILLOW* Not an unpleasant result.

Well, there you have it. Now its up to you to use these ideas in your own programs!

I am always glad to receive your letters (and many thanks to the TI*MES members who during the last quarter have written so many nice letters!). Your news, information and questions are required to keep Rambles in full swing!

It is not always possible to write back to you as fully as possible (and an SAE is useful if a reply is needed!) but everything is read!

MAIL ORDER BY CREDIT CARD: As so much has to be bought by mail order, some short notes on using credit cards:
a. If the purchase is for over a hundred pounds AND you obtained your card AFTER the Consumer Credit Act came into being , you have the same right against the credit card company as the retailer for faulty goods &c. Useful.
b. Contrary to magazine reports, although in general a supplier cannot charge your account until the goods are ready for despatch, this is not an absolute rule. The credit card company MAY allow him to charge you even if goods are not in stock.

Thanks to Philip Marsden for his Forth program in Issue 8. Examining such a program can show you things not adequately dealt with in the Manual, eg how to use variables (what's wrong with the stack!!!) and how to handle user inputs.

It could be the rain and wind here in Manchester that make us Mancunians write so much... or it could be that we can identify a powerful computer when we see one...???

Sorry not to have met any of you at Brighton, but I have other duties on Sundays, and anyway, travelling so far on a Sunday would have been impractical, & I have lost so much on Stainless Software, I don't have the fare! Perhaps there will be another meeting nearer Manchester, and on a Saturday!

Stephen Shaw

MANCHESTER MUSINGS

by John Rice

The Printer Saga Continues

Courtesy of Howard Greenberg of Arcade Hardware I've just acquired a Centronics cable to connect the parallel interface on my Tandy DMP-110 printer to the Corcomp RS232 card's parallel port. It works - so the Corcomp card does give a true Centronics interface. There are two interesting consequences. Firstly, the printer seems to go faster: even though it only prints at up to 83 characters a second and the Corcomp serial interface operated to it at up to 120 characters a second. I think this must be due to the way the printer and/or the Corcomp device driver handle the parallel interface. Secondly, it doesn't drop characters, which the serial interface occasionally did, particularly after a row of underlining. I think that was a printer fault. The real incentive to get the parallel interface connected was twofold: the Modem Utility (B1 in the TI*MES library) allows a log of RS232 traffic to be sent to the printer, but uses the RS232/1 port itself; and "The Hitchiker's Guide to the Galaxy" (like all Infocom games) gives the option of a printed copy of the script being sent to a 300 baud RS232/1 line (a speed at which my printer doesn't operate) or the parallel line - the latter clinched it - I've not yet bought my modem.

Disk Update

At the TI Users Show I purchased a secondhand TI external disk drive from Arcade Hardware. It's a Shugart-made drive and has the ability, previously only demonstrable on a Beeb drive at work, to read disks conveniently folded by my postman. The latter had the cheek at 7.30 a.m. the other Saturday morning to fold a packet in half, try to stuff it through the letter box, fail, remove the packet, ring the doorbell, and hand me a packet (admittedly unmarked) apologetically. Only afterwards did I realise what he'd done!

I really don't know how I ever managed without two disk drives; life's so much simpler these days. For Editor/Assembler or TI-Writer, the system disk stays in Drive 1 and the data disk in Drive 2; whereas with Mailing List I load the programs from Drive 2 and keep the data on Drive 1. It's great not having to swap disks!

Magazines

I eventually decided to solve the problem of guaranteeing regular delivery of COMPUTE! Magazine by ringing COMPUTE! Subscriber Services one evening on 010-1-919-275-9809 and ordering it with my VISA card at 30 dollars for delivery by surface mail ("lengthy and unreliable"). I placed the order on 13th March, the sum of £23.40 was debited on 9th April (the exchange rate was certainly in my favour that day) and the June 1985 issue arrived on 16th May, two days before the May 1985 issue arrived at my local newsagents, where it cost £3.10. Even allowing that phone calls to the USA aren't cheap, I think I've saved a pound or two (there's no tax on literature ... yet!).

TI Home Computer Users Club

I've had a reply to the letter I'd sent with the arguments I discussed in the last issue: "If you wish to receive the remaining publications during 1985 then please send us a cheque or postal order for £4 and we will keep your name and address on our mailing lists". I duly sent off my cheque, and have been told "we will be sending you the next copy of the Club News towards the end of May 1985".

FORTH Again

There was an unintentional error in the FORTH routine to read the disk controller software that I gave in the last issue - the last but one line should read:

```
4000 MYBUF 2000 CMOVE ( copy out disk controller software )
```

I omitted the "2000" character count for the character move (did anyone notice?).

Incidentally, in adding his comments to his Disk Formatter program, Phillip Marsden omitted some of the FORTH text - so if you're typing up his useful routine, use the definitive version in TI*MES Issue 7.

TI Clinic - a Postmortem

There were quite a few questions and comments from the TI User Show's TI Clinic which can usefully be shared with readers.

1. A user had a problem reading records previously written onto cassette when, in both cases, the files were OPENed as DISPLAY type with FIXED 16 records. The program worked alright when the same files were written and read on disk. The problem, I'm sure, is a result of the fact that TI BASIC rounds up the record length from the declared 16 characters to the minimum length (which is also the default) of 64 characters, and the program, reading a string, failed to take this into account. Incidentally, the only other two permissible record lengths on cassette are 128 and 192. You are also recommended to use INTERNAL, rather than DISPLAY, type files on cassette.

2. In Extended BASIC, how do you check whether a word's in the speech synthesiser's vocabulary, without using CALL SAY and getting an "UHOH" spoken? One answer is to use CALL SPGET, and check whether the return string is the same one that is obtained when calling SPGET with "UHOH" as the word string. The program below illustrates the technique:

```
10 CALL SPGET("UHOH",Z$)
20 CALL SAY("#READY TO START#")
30 INPUT "TYPE ANY WORD:":A$
40 CALL SPGET(A$,Y$)
50 IF Y$=Z$ THEN CALL SAY("#WHAT WAS THAT#,#TRY AGAIN#") ELSE CALL SAY(,Y$)
60 IF A$<>"END" THEN 30
70 CALL SAY("GOODBYE")
80 END
```

3. With the Terminal Emulator 2 module plugged in, one user reported problems when using the command to list from a line number to the end of the program using the "SPEECH" device; e.g.

```
LIST "SPEECH":500-
```

He also said that if you break in on this command and re-issue it, the speech synthesiser gets confused and speaks some rubbish. Now, try as I might, I cannot reproduce this problem on my TI-99/4A at all. Has anyone else had the problem?

4. In Extended BASIC, what will disable the effect of the "QUIT" function key?

```
CALL LOAD(-31806,16)        Disables the QUIT key
CALL LOAD(-31806,0)         Enables it again.
```

5. The command to turn off all disk drives and free the buffer space, published in TI*MES Issue 8 on page 52, is incorrect. The correct command is:

```
CALL LOAD(-31888,63,255)
```

which should be followed by NEW. From Extended BASIC, CALL INIT must also be called.

6. In TI BASIC, typing FCTN/J/SPACE (all three keys together) has the same effect as typing FCTN/4 (CLEAR) - i.e. it causes a break point in a running program.

Book Reviews

Here are some reviews, first of a "private publication" available from its author; and then a number of COMPUTE! Books.

1. "TI-Writer Companion" by Dr. William G. Browning, 7541 Jersey Avenue North, Brooklyn Park,MN 55428, USA; $2.50 plus postage (about $6 air mail).
This is a 29-page A4-size document which comes 3-hole punched to insert in the binder of your TI-Writer Manual. It consists of 7 sections entitled Time Savers, Creative Uses of the Search Function, Special Strategies, Page Formatting, Numbers, Disk Management and TI Graphics. Dr Browning is safe in offering a money-back guarantee - the tips, particularly on how (albeit somewhat tediously) to get professional-looking right-justification, partially underlining words, and the size of files in words, are useful and it is well worth the asking price. However, the postal cost is so high that it takes the edge off the purchase.

2. "COMPUTE!'s First Book of TI Games" edited by C. Regena; ISBN 0-942386-17-5; $12.95, 211 pages.
This book consists of about 30 programs, most of them published in COMPUTE! Magazine between 1981 and 1983. Each program has a brief accompanying description and there is a helpful introductory chapter on Programming the TI fo games. The games are collected in groups of 3 or 4 under the headings: Maze Games, Chase Games, Old Favorites, Thinking Games, Creative Games, Scrolling, Action Games - all in TI BASIC, plus a closing chapter of 7 Extended BASIC Games. Like all COMPUTE! books, it's spiral bound so it lies flat as you type in the programs - a very useful feature. The programs are well written and, apart from being fun to play, demonstrate a wide variety of programming features which are worth studying.

3. "COMPUTE!'s TI Collection, Volume One"; ISBN 0-94238671-X; $12.95, 309 pages.
The forward says "this anthology of games, applications, utilities, and tutorials for the TI-99/4A contains many never before published". In addition there are 18 which were published in COMPUTE! between 1982 and 1984. This is an ideal book if you want to start to explore what your TI-99/4A can do - particularly if you have Extended BASIC - even more if you have a disk and a printer. The chapters are Getting Started, The BASICs, Applications (including "mini" programs for mailing list, spreadsheet, data base and word processor), Recreation, Sound and Graphics, Sprites and Utilities (Disk Deleter and Master Disk Directory - for up to 50 disks and 450 files). All the programs are excellent, but I'm a bit confused by the fact that it includes a character set generator program Superfont (with 19 commands) which is more comprehensive than the version of the same program (with only 16 commands) published in the June 1985 issue of COMPUTE! It makes you wonder how many more of the other previously unpublished articles will be re-published in future.

4. "COMPUTE!'s Guide to TI-99/4A Sound and Graphics" by Raymond J. Herold; ISBN 0-942386-46-9; $12.95, 210 pages.
The jacket describes this book as "a complete guide to sound, graphics and speech synthesis on the TI-99/4A, including arcade-style games, music routines, and educational programs, ready to type in and use." The contents certainly live up to the cover blurb. The book is geared towards the use of Extended BASIC. Its chapters cover Graphics, Sprites, Sound and Speech Synthesis. The speech chapter covers the standard Extended BASIC Call SAY and CALL SPGET routines, but also the TI Text-to-Speech Diskette (which needs 32K RAM) which adds a library of routines to Extended BASIC (XLAT to translate text to allophone strings; SPEAK to speak them). If you want to write programs that exploit the 99/4A's facilities to the full, and have Extended BASIC, you'll find the book very useful.

5. "COMPUTE!'s Guide to Extended BASIC Home Applications on the TI-99/4A" by Christopher Flynn; ISBN 0-942386-41-8; $12.95, 199 pages.
All the programs in this book are in Extended BASIC, as the title implies. It starts with a chapter on Extended BASIC Techniques, with 11 short illustrative programs. It then launches into chapters on File Management, Electronic Spreadsheets, Computer Graphics (actually bar charts), Electronic Card File and Appointments Calendar. Each chapter includes programs which use a cassette drive for data file storage and will run without the 32K RAM expansion, but more comprehensive versions are provided to make use of the extra memory, disk drives and printer for those lucky enough to have them. I'm a bit unsure of the value of these "business type" programs for the "home" - though the Electronic Card File is useful, within its limitation that "cards", once entered, can be amended (though their indexing information can't), but cannot be deleted. The final chapter provides a program to load all the others in the book, so if you are looking for a complete "home office" program suite, this book provides it.

6. "33 Programs for the TI-99/4A" by Brian Flynn; ISBN 0-942386-42-6; $12.95, 199 pages.
Who would want a set of programs to plan a US Individual Retirement Account, run a computer as a cash register, hide Brer Rabbit in a briar patch, do multiple linear regression analysis, and test the quality of the TI-99/4A's random number generator? Here's a book for all the family! Well, one with parents in business, a mathematically-inclined teenager and a young child, anyway. There are chapters on Money Management, Basics for Business, Games, Curve-fitting Routines, Matrix Manipulations, Simple Statistics and Numerical Analysis. All the programs are in Extended BASIC.

7. "COMPUTE!'s Beginner's Guide to Assembly Language on the TI-99/4A" by Peter M.L. Lottrup; ISBN 0-942386-74-4; $14.95, 262 pages.
Peter Lottrup wrote an excellent series "Have No Fear: Assembly Language Won't Byte!" in 99er/Home Computer Magazine. Here he provides a similarly lucid exposition of the joys of programming with the Line-by-Line Assembler for the Mini Memory Module. This book fits neatly between the over-thin Mini Memory Manuals and the over-technical Editor/Assembler Manual - in content as well as size. It starts at the very beginning - assuming no previous knowledge. When you've worked through all the examples, you'll know about the Keyboard and Joysticks, Utilities, Mathematics and Scrolling, BASIC and Assembly Language, Character Definition and Colour Changes, Creating Sprites, Generating Sounds and Graphics Modes. I've seen most of the books on assembler for the TI-99/4A, and I think this is probably the best. Well worth getting.

Adventure Review
"The Hitchiker's Guide to the Galaxy", Infocom Software (available from Arcade Hardware); £39.95 (disk only).

At last: the computer game of the stage show of the TV series of the book of the BBC radio serial! If you enjoyed any of its previous incarnations, you'll love this (text-only) adventure, even though you need 32K expansion RAM, a disk and one of Extended BASIC, Mini Memory or Editor/Assembler to run it. Even before you've loaded the disk, there's the 25-page colour Instruction Manual to read, and an inventory to take of the handy objects included in the packaging: Fluff("goes anywhere - under the bed, behind the commode, at the bottom of your pocket, inside your navel!"), Destruct Orders for Your Home and Planet, "Don't Panic" button, Joo Janta 200 Super-chromatic Peril-sensitive Sunglasses, a Microscopic Space Fleet and No Tea("just like the tea professional hitchikers don't carry!").

The disk itself is a curiosity - a "flippy" - with two index holes punched in the casing, so that Side 2 is on the reverse of Side 1 - you just turn it over to read it on a single-sided 40-track drive. The program (in versions for different systems) occupies Side 1, and Side 2 is full of the data for the adventure itself.

Does the content live up to the packaging? "Yes". I'm not keen on adventure games usually, but the chatty, humorous, sarcastic dialogue makes even a total failure to solve the adventure an enjoyable experience. You play the role of Arthur Dent "a rather ordinary earth creature" who suffers an incredible sequence of intergalactic misadventures. If you enjoyed the radio or TV series, you'd pay 3 million Altarian dollars, never mind, £39.95, to play it. If you couldn't stand it before, you'll not like it now!

>GET OUT OF BED
Very difficult, but you manage it. The room is still spinning. It dips and sways a little.

>PICK UP THE TATTY DRESSING GOWN
Luckily, this is large enough for you to get hold of. You notice something in the pocket.

>PUT ON THE GOWN
You are now wearing your gown.

>OPEN THE POCKET
Opening your gown reveals a thing your aunt gave you which you don't know what it is, a buffered analgesic, and pocket fluff.

>TAKE THE ANALGESIC
You swallow the tablet. After a few seconds the room begins to calm down and behave in an orderly manner. Your terrible headache goes.

>DRAW THE CURTAINS
As you part your curtains you see that it's a bright morning, the sun is shining, the birds are singing, the meadows are blooming, and a large yellow bulldozer is advancing on your home.

>PICK UP THE SCREWDRIVER
Taken.

>FIND THE DOOR
You figure it out!

Ah, well; just time to pop the fluff in my pocket, polish my Don't Panic button and settle down for another evening's hitchiking. Who said adventures weren't addictive?

Educational Software Reviews

Remember last time, I said I'd ordered some Scott, Foresman (SF) educational software modules at $4.95 each in their "close-out" sale? Much to my surprise, all 14 arrived, and SF only charged me $1.40 shipping and handling fee for the lot.

The "Mathematics Action Games" have been available in the USA for some time. The IUG stocked them at $34, which then declined to $34 for two - but at $4.95 they're a real bargain. Frog Jump, Picture Parts, Star Maze, Pyramid Puzzler, Number Bowling and Space Journey are in a fairly standard format: answering a maths question gives you a turn at a game. The sound and graphics are excellent.

The "Reading Skills Courseware", I believe, has not been issued before. The "regular price" quoted is $39.95 - so $4.95 is a real snip. Some people worry about American spellings and words and the effect they have on children - I suspect that's why TI didn't distribute the previous reading modules in this series (Reading Fun, Reading Flight, etc) in the UK - but there are hardly any words in the entire series which are different in meaning or spelling between the US and UK. Each module comes with a 32-page pupil's reading and activity book (in colour) as well as the usual module instruction booklet - and they're a distinct cut above the sort of material available on other home computers. More importantly, they follow on from the Early Reading module (though few use speech) and supply material for older primary school children - for whom there were few previously issued TI modules. The use of colour graphics in many of the modules is nothing short of fantastic as "a host of animals and story characters help children strengthen a variety of reading skills."

The "Mathematics Courseware Series", for which the early parts (Addition and Subtraction 1, etc) have been available in the US and UK for some time, has been extended. I've received "Addition and Subtraction 3" and "Multiplication 2". SF's blurb that "brilliant use of colour and animation illustrates concepts instantly and helps children practice and improve their grasp of basic maths fundamentals" is true.

All the new modules are designed for the 99/4A.

How do you get hold of these modules? I wrote to:

Scott,Foresman and Company,
400 S. Edward Street,
Mount Prospect,
IL 60056,
USA

enclosing my VISA number, name, address, signature and card expiry date. There's import duty and VAT to be collected by your postman, of course. Quote the Scott,Foresman reference number from the list below. Each module costs $4.95, and there's $1.40 postage and packing charge on the whole bill.

Scott, Foresman Educational Software

One of the problems with buying software from the US for children is that it's classified in "grades" rather than children's ages. SF have at last recognised this difficulty and their new "previously unavailable" modules are classified by age. So I'll end this article with a complete list of those modules in SF's "closeout sale".

Reading Skills Courseware

SF No	Title	Contents	Age
117	Reading Rainbows	Comprehension (needs Speech Synth.)	5-7
119	Reading Cheers	Word identification	6-8
121	Reading Adventures	Comprehension	7-9
123	Reading Trail	Literary understanding and appreciation	8-10
125	Reading Power	Study and research	9-11
127	Reading Wonders	Literary understanding and appreciation	10-12

Mathematics Action Series

SF No	Title	Contents	Age
176	Frog Jump	Counting and ordering numbers	5-8
179	Picture Parts	Basic +, - and ×	5-8
182	Star Maze	Division facts, remainders, short division	8-12
185	Pyramid Puzzle	Multiplication facts, × by 100 and 1000	8-12
188	Number Bowling	Decimals and fractions	11-adult
191	Space Journey	Percents	11-adult

Mathematics Courseware Series

SF No	Title	Contents	Age
128	Addition and Subtraction 1	Basic facts through 9	5-7
129	Addition and Subtraction 2	Basic facts through 18	6-8
131	Numeration 1	Place value through 3 digits	5-8
130	Addition and Subtraction 3	2-digit and 3-digit numbers	7-9
132	Numeration 2	Place value through 9 digits	7-11
133	Multiplication 1	Basic facts	7-9
138	Decimals 1	Meaning of decimals, + and -	9-11
134	Multiplication 2	1-digit multipliers	8-10
135	Division 1	Basic facts	8-11
136	Fractions 1	Meaning of fractions	9-11
137	Fractions 2	Like denominators	9-11
139	Decimals 2	Multiplication of decimals	10-11

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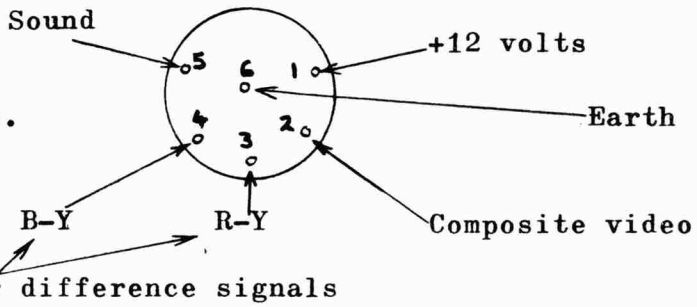
TI MONITOR CORRECTION

With reference to the TI monitor connection on p26 of the Spring issue of TI*MES. The connections shown are correct for the American NTSC version of the TI99/4A but should not be used for the U.K. version. The U.K. console has a six pin DIN socket for the video connection, the sixth pin being in the centre.

EUROPEAN PAL CONSOLE

U.K. pin connections.



The connection for a monochrome monitor should be across pin 6 (earth), and pin 2 (composite video). If the monitor were connected as shown in the diagram on page 26 of TI*MES it may appear to work correctly, but earthing pin 2 of the sketch on p26 (pin 3 of the sketch above) would short the R-Y signal to ground and can damage the video output I.C.

The input impedance of the monochrome monitor should be fairly high (above 560 ohms) and not 75 ohms (which is a standard value), as the video output circuit of the console can be damaged feeding a 75 ohm load.

VIV. COMLEY

LIBRARY REVIEW

by Graham Hilton

REVIEW: GOTHIC. Full system and printer required.

Those of you who were lucky enough to get to the TI USERS show in Brighton will probably have seen this program being run on the group stand. It is quite an interesting utility in that it converts your printer into very good Gothic characters ie. ye oldy worldy script. Written in Ex.Basic and needing the full system (sadly) it makes a very impressive utility. You can enter your message one line at a time,the computer then sends the codes to the printer.

REVIEW: TPL/LISTER EX.BASIC and PRINTER required.

The more fortunate members of the group who have the full system and who use the the Disk Manager Module will find this utility handy. If you wish to Catologue several Disc contents to your printer there is a great deal of paper wasted as you can only print one Disc at a time. This program gets round this problem by asking you to put three discs into the drive in turn, and then catalogues them to your printer in CONDENSED mode on the same line ie. instead of printing one at a time and then feeding paper through for the next disc. The finished work can then be cut into three and then stored with the relevant disc. Very handy!

REVIEW: U43A SPRITE EDITOR EX.BASIC

This is about the best sprite editor that I have seen. With this utility you can design your own sprites easily on screen,foreground and background colours can be changed at will.Also, your creations can be set in motion as well as magnified at the same time. With the prog comes another couple which for people with the full system can be merged to create a good demo of your sprites. A useful utility for the Extended Basic games writer. Options include joystick or keyboard control.

REVIEW: U06 PLANNING CALENDAR EX.BASIC EXPMEM, DISK DRIVE PRINTER REQD.

A program which enables you easily to print a planning calendar month by month. If you like to have a calendar with spaces to enable you to write appointments etc. this could be the one for you. Quite a large prog, hence the full system required.

REVIEW: G27S CIRCUS BALLOON GAME EX.BASIC

This is a simple idea but quite tricky to perform. The game consists of a little man on a trampoline. The object is to bounce him up in the air to burst lots of balloons on the roof. There are flocks of birds flying around to distract you, also when the trampoline is moved, the angle of bounce alters and makes it quite difficult to catch him. I seem to recollect seeing this listing in the American "COMPUTE" magazine. So I would recomend you to get this one to save all that tedious typing.

CLASSIFIED ADVERTS

NEW SPEECH SYNTHESISERS complete with editor for speech in TI Basic or Ext. -£21.50. TEL. 0742 655582(evenings)

MINIMEM BATTERY run down? Send MM and crossed cheque for £7.50 for replacement rechargeable battery to, Tensal Technology, 3 Lester Drive,Worle,Weston super mare,Avon.

WANTED - TI99/4A EXTENDED BASIC MODULE. Michael Greener, 2 Evington Ave, H/r Openshaw,Manchester 11.

FOR SALE-COMPUTER and tape recorder(3 months old,speech synthesiser,extended basic,joystick,Donkey Kong, Miner 2049er, graphic creator, teaching aids and numerous cassette games and books. £140. Phone 0574-73748.

FOR SALE-EXPANSION BOX, 32k ram card, 232 card, disc controller card, internal disc drive, Multiplan, TI writer plus 4 Texas disc programs.£400 the lot. Telephone 0908 582488.

FOR SALE-TI99/4a, printer, speech synthesiser,TEII, Extended Basic, MMM,chess and other modules, tapes, 99ers and other items. Cost over £750. Will accept £450 ONO or will split. TEL (0532)738075 DAVE.

FOR SALE-TI99/4A, PE BOX,32K RAM,RS232,DISC CONTROLLER AND INTERNAL DISC DRIVE. TI dot matrix PRINTER, Ex.basic, TEII, Multiplan, TI Writer, ED/ASS., PRK, PRG, home budget, lots of discs, books and magazines. £850.worth £2000 Viv Topping 01 349 2821.

SWAP SHOP SWAP SHOP SWAP SHOP

SWAP * BUCK ROGERS, MOONSWEEPER. **WANTED** * STARTREK, BURGERTIME,MASH OR FATHOM. CONTACT Alexander 0273 503968. **SWAP** * MOONSWEEPER, THE ATTACK, CHISHOLM TRAIL, SPEECH EDITOR, MUNCHMAN.**WANTED** * DEMON ATTACK, POPEYE, FATHOM, HOPPER, MIDNIGHT MASON or similar. Contact 037-44 65907.

SWAP * HOUSEHOLD BUDGET MANAGEMENT, CAR WARS + QUICKSHOT I. **WANTED** * TUNNELS OF DOOM, POPEYE OR make me an offer of A.N.OTHER. Tel 0742 655582.

SWAP * NAVARONE DBM SORT MODULE and manual-personal import.**WANTED** * EDITOR/ASSEMBLER and/or E/A manual or SPECH SYNTHESISER. Barrie Fitton,01-986-6587.

SWAP or sell. Connect 4,Zero Zap,Personal financial Aids(tape),Simons Saucer(B),Home Budget Management, Teach Y/s basic and Ext.Basic,Tombstone city.

WANTED - Tunnels of Doom.**SWAP** for any two of TE2, Music maker, car wars, Parsec. John Rogers Jnr,75 Tong Rd,Armley, Leeds.

SWAP - Jungle Hunt. WANTED - Moonmine/ MASH/Jawbreaker/Startrek or similar. E.Armstrong,16 Home Close,Renhold,BEDFORD

COMPUTER HOME SERVICE

******** **** *******

TI99/4A DUST COVERS. Best selling standard cover in semi-clear durable PVC with bound and stitched edges.£3.25+35 P+P.

De luxe cover in lined leathercloth with clear keyboard panel. (RRP £4.99)..£4.00+35 P+P.

TV AERIAL SPLITTER (SWITCHED) will prevent wear on TV socket and cable. Simply flick a switch to £2.25 +25 P+P

****

GETTING STARTED WITH THE TI99/4A by Stephen Shaw....£5.00

MASTERING THE TI99/4A by Peter Brooks.£5.00

****

TI99/4a TRIVIA DATA BASE. Sams Publication book-cassette. (Extended basic) Few left in stock £15 inc. postage.

Send Order to COMPUTER HOME SERVICE, 40 BARRHILL PATCHAM BRIGHTON BN1 8UF.

PLEASE ALLOW 28 DAYS TO PROCESS

****

TI*MES back issues still available are ONLY issues 4,5 and 8. They cost only £1 each to members.

TI99/4A EXCHANGE, BRIGHTON.

NEW! Binders to keep your TI*MES magazines clean and tidy. Dark blue hard covers with gold embossed title will take 5-6 copies. Available from ARCADE HARDWARE £3.95.

REACH TI99/4a USERS FAST. ADVERTISE ON THIS PAGE FOR 5P A WORD. (MEMBERS ONLY) Trade Advertisements Rates on application.

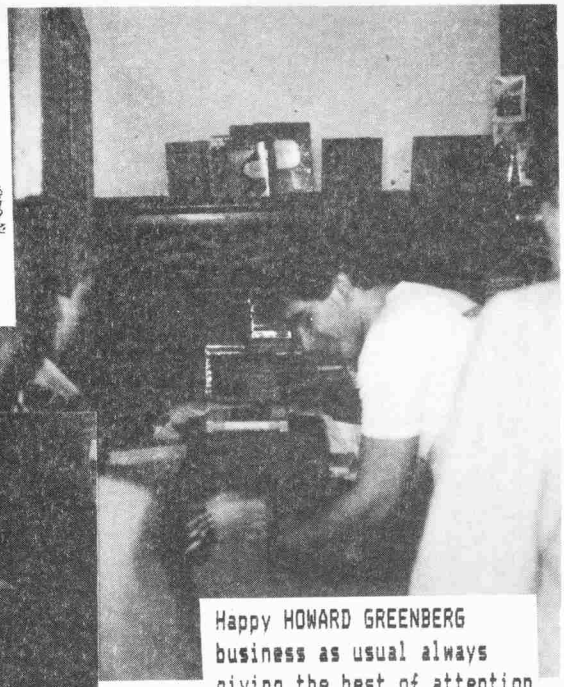
Make a Date
next TI USERS SHOW
26th October 1985
BIRMINGHAM.
See you there, full details next Iss

"The most fantastic palace in Europe"

TI99/4a Users Show at

The Royal Pavilion Brighton

BBC Interview, keeping the TI99/4a in the limelight.



Happy HOWARD GREENBERG business as usual always giving the best of attention to TI99 Users.

JOHN RICE talking to 'patients' at the TI99/4a Clinic.

DENNIS WEBB FAMILY selling his all British software.

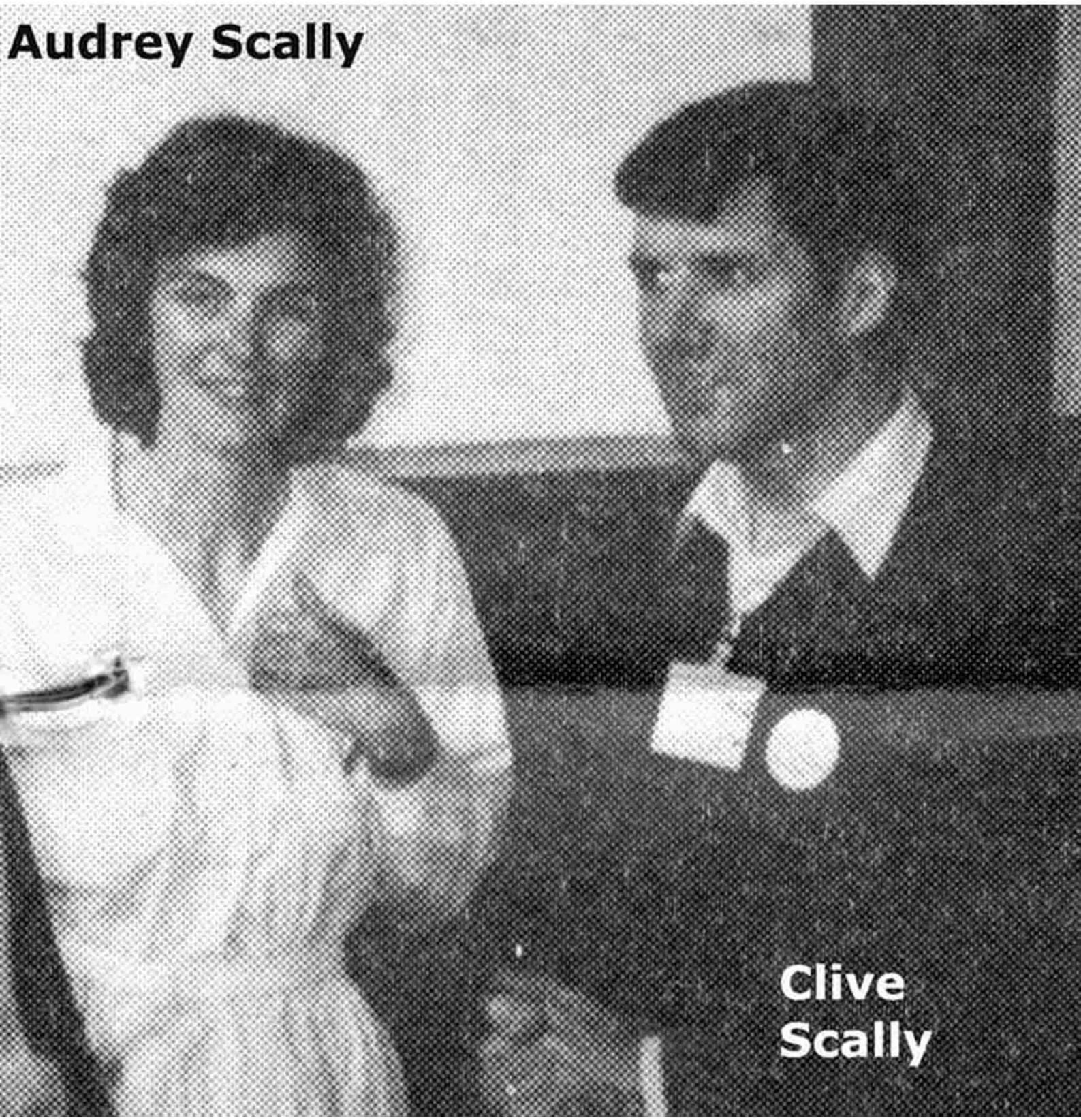
Belgium visitor talking to Audrey and Clive on the Group stand.

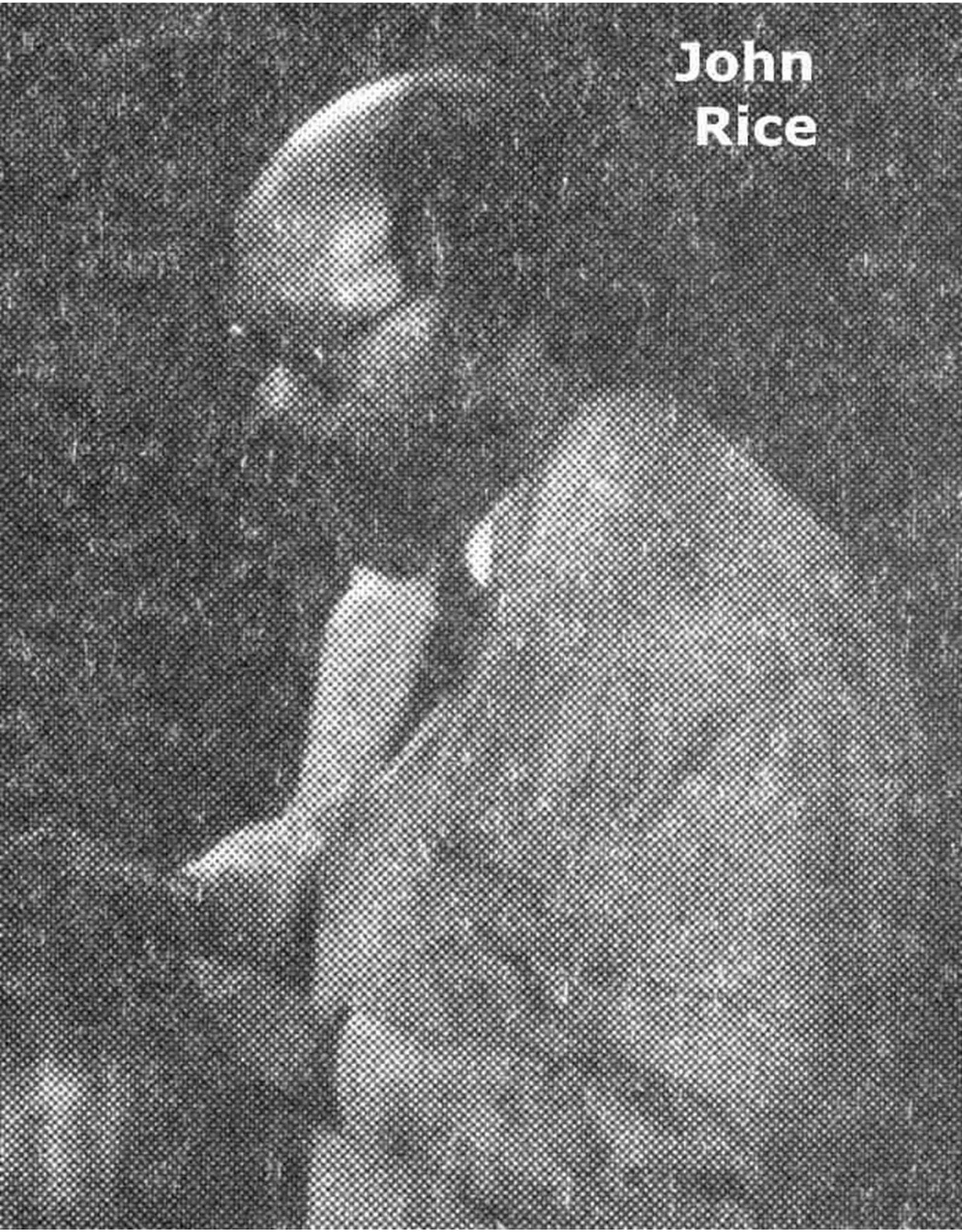
Lots of TI99/4a goodies from Francis Parrish (Parco).

PETER BROOKS TI OXON USERS STAND.
Talking to Allen Burt

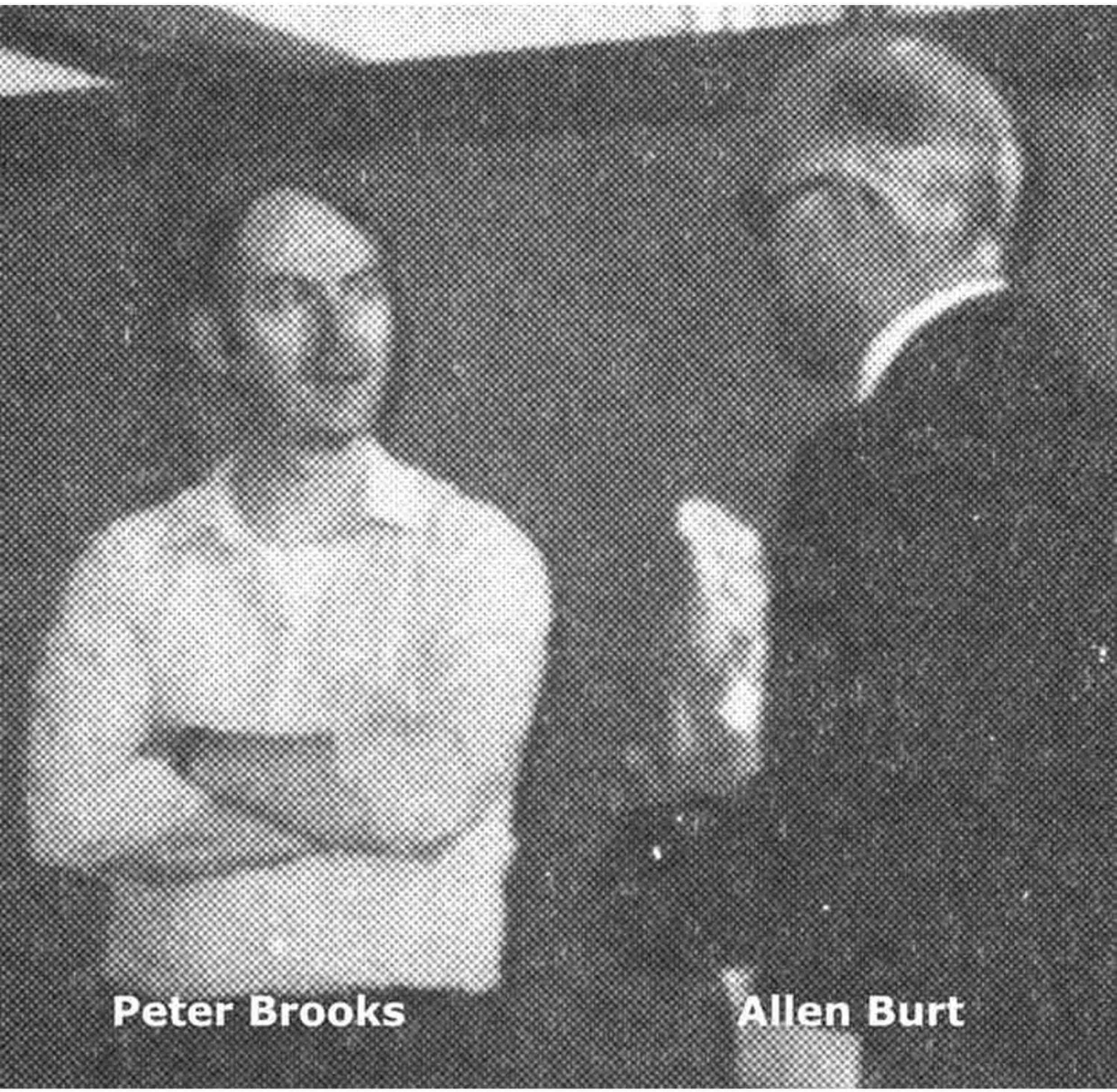
Clive Scally

Howard Greenberg- Arcade Hardware


Audrey Scally
Clive
Scally


John
Rice

Intrigue Software
Martin's Mum
Martin Webb (Programmer)
Dennis Webb (Martin's dad)

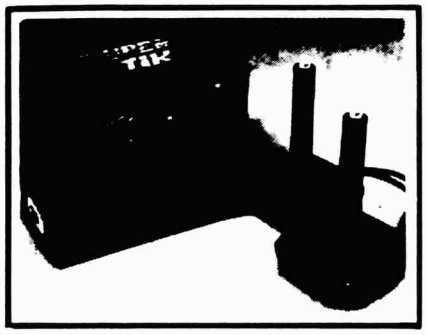

Peter Brooks
Allen Burt

PARCO ELECTRIC
Francis Parrish on the right possibly
Harry Pridmore in the shadows at the back

ARCADE HARDWARE

211 Horton Road, Fallowfield, Manchester M14 7QE. Tel: 061-225 2248

JOYSTICKS
PERSONAL PERIPHERALS £24.95



Wired as a pair, these superb joysticks plug directly into TI99/4A and require NO adaptor. Rated at 50 lbs. breaking strain, these joysticks give excellent response.

SUPER CHAMP single joystick £14.95

Suckered base-wired for TI.

NEWPORT CONTROLS PROSTICK II

The Rolls-Royce joystick with adaptor to suit TI99/4A.

£22.00

Newport Control's Prostick II.

NAVARONE WIDGIT
Cartridge Expander

Enables up to 3 modules to be plugged in at once. Switch between any module quickly and save wear on your cartridge port.

Owners of full peripheral systems can also examine module contents by loading De-Bug into memex and then switching to module to be examined.

£39.95

HARDWARE OFFERS

Buy Myarc or Boxcar RS232 and pay only £12.00 for printer cable (RS232 or Parallel). Normal cable price £18.00.

Buy Myarc Mini-Box and pay only £100.00 for internal disc drive. (Single sided.) Or pay £135.00 for double sided disc drive. (This offer for drives only applicable until 1st September.)

MYARC

MYARC MINI-BOX £495.00

This peripheral box is hard wired. (No cards, but all in one.) Giving more power than the Texas Box in a smaller package. It contains:

1 x True centronics
1 x RS232
Disc Controller with provision for four double sided double/single density disc drives.

Space and power is provided for two half height internal disc drives.

MYARC PERIPHERAL CARDS
(for the Texas peripheral Box)

RS232 CARD £125.00

Provides True Centronics and extra features within Centronics such as Inverted Busy. The baud rate on RS232 is now doubled to 19200.

DISC CONTROL CARD £185.00

Provides control of up to four double sided double/single density disc drives. Full compatibility with all T.I. software is maintained whilst giving the opportunity to **quadruple** the disc storage per drive!

128k R.A.M. CARD £249.95

32k R.A.M. card with a 96k R.A.M. disc for instant access to stored files. Can also be used as a printer buffer. News from Myarc now means full 128k can be used as R.A.M. disc, if you already own 32k card. Also upgradeable to **512k!!**

More complete details on all Myarc products will be sent on request.

BOXCAR STAND-ALONE

RS232 Interface. Supports all T.I. Protocols. Provides RS232/1 and PIO.

£119.95

BOXCAR 32k R.A.M.

Supports all T.I. programs requiring memory expansion.

£125.00

AXIOM

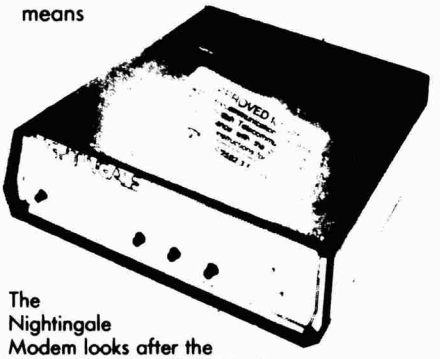
Parallel stand alone Interface. Allows access to all popular printers using Centronics Interface.

£109.95

N.B. All stand-alone peripherals require a U.K. mains adaptor. Not supplied.

COMMUNICATIONS

Now the TI99/4A can communicate and here's the means



The Nightingale Modem looks after the current facilities offered by the TI99/4A and whatever the future may hold.

Think of the amount of information locked away in databases around the world. Now, using the Nightingale modem connected to your RS232 port and T.I.'s terminal emulation software, you can access databases, bulletin boards and even communicate with each other!

But the Nightingale is equipped for the future too! Already, in the U.S.A. Disc based terminal emulation software exists for the 1200/75 and 75/1200 based bulletin boards. So when this software becomes available over here, you will at last be able to get into Prestel, without having to go through the expense of the long distance call for the London based 300/300 service. But Prestel isn't the only service available, Micronet, Viewfax, Homelink, Telecom Gold and dozens of Bulletin boards are now at your disposal.

The Nightingale has the coveted British Telecom green sticker — so it's approved by British Telecom for connection to their services. All that's required to connect it to your phone line is the new style white socket.

Look at the facilities — 300/300 baud —. 1200/75 and 75/1200 baud, originate and answer — CCITT (European) and Bell (U.S.A.) Self test. At the price, the Nightingale cannot be bettered.

PRICE £145.00
including cable to connect to TI RS232.

Special Offer!

Nightingale Modem and Myarc RS232 card only

£255

DISC DRIVES FOR YOUR TI99/4A

INTERNAL DISC DRIVES
To suit T.I. or Myarc Disc Controller

Single sided 1/2 height £125.00
Double sided 1/2 height £155.00

It is possible to fit two half height drives in the T.I. box, but is inadvisable to fit two double sided drives unless the power supply is beefed up

EXTERNAL DISC DRIVES
To suit T.I. or Myarc Disc Controller

Single Sided 1/2 height £155.00
Double Sided 1/2 height £185.00

External drives come complete with power supply, mains lead, cable to connect to back of TI/Myarc disc controller and are wired as DSK1/DSK2/DSK3/DSK4 (Please state choice on order) DSK 4 is optional only to Myarc Controller owners

HOWARD WRITES AGAIN

by HOWARD GREENBERG

Nice to be back! I did actually write a piece for the last TI*MES, but never sent it to Clive & Audrey in time so that's why you were spared my monologue in your previous edition.

Brighton 28th April. Thanks to everyone who turned up. I enjoyed myself thoroughly, and with the help of Dennis, Neil and Russell, managed to have a little more time than in Manchester to chat with people. It was also a pleasure to meet several "voices on the 'phone" who lived nearer the south coast than Manchester.

I'm often asked to review products I retail in this column, but have held back since I feel that my opinion is hardly the most unbiased one your likely to receive. This time though, I'm going to make a couple of exceptions.

I was waiting for two parcels from the U.S.A. which I'd hoped would arrive in time for the Brighton show. One was from Myarc as I was hoping to demonstrate their new peripheral box, the other from Infocom, containing their adventures. Infocoms parcel arrived, Myarcs did too. The Monday after the show!

Infocom probably make the most amazing adventures around. The trouble with adverts is that they're not likely to point out a manufacturers shortcomings. But as far as I can tell, Infocom don't have any, other than price. And you do get a lot for the money. Their packaging is superb. For instance, I'm attempting Cutthroats at the moment. I received a disc with the game on it, a magazine bound into the cover, a booklet from the "Hardscrabble shipwreck society, a chart showing tide timetables, and a booklet giving prices of charter equipment for diving. But, it's in the adventure itself that the difference between Infocom and any other adventure game appear. The prose is much more comprehensive. And the way to enter text is more like English than the more usual OPEN BOX. (Verb Noun). I could for example enter, "OPEN DOOR, GO OUT AND LOCK THE DOOR WITH THE KEY, GO DOWNSTAIRS AND ORDER FOOD". Different adventures have more or less documentation depending on the game and your needs. Deadline, where you investigate a murder, comes complete with a lab report. I'm very impressed with Infocom games. They are worth their price and I think their great drawback is the equipment required. (They need 32k and disc system. A printer would be useful too).

So far, I've been raving about Myarcs peripherals. Their cards are in every case superior to T.I.s, doing the same job, and more. So it was with great eagerness, that I finally unpacked one of their peripheral expansion systems. It looked.....decidedly *odd*. Somehow, after handling so many T.I. boxes which are built like tanks, the Myarc MiniBox seemed somehow *Japanese* in feel. Sitting an inch taller than the T.I. box, it seemed very disproportionate to the Texas Box. Its dimensions are approximately 7" tall, 6 1/2" wide and about 13" deep. So in volume terms it is about half the size of the Texas Box. I didn't much care for the edge connector to connect it to the computer, even though it does take up a great deal less room. Installing a couple of double sided drives, I connected the thing up, plugged it into my computer and with a deep breath turned on. (The power switch is on the back which I don't approve of). A red l.e.d glowed on the front to let me know it was powered, there's no annoying fan blasting away in there. The transformer gives a faint hum, which was irritating, but not nearly as much as I find the fan on the T.I. Box. Loading in a T.I.-Writer disc, then set about using it. Because my own system is set up the way it is, I couldn't examine the true Centronics output. (My own printer is Epson compatible), but as long as they've used the same software/hardware combination as on their RS232 cards, then I'm satisfied that it will be true Centronics. The box worked perfectly. 32k

ARCADE HARDWARE

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DISC BASED SOFTWARE

All disc based software requires Disc Controller, at least one disc drive and 32k R.A.M.

MICROSOFT MULTIPLAN

Spreadsheets aren't particularly user-friendly and Multiplan is no exception. But it is the same version as used on the Apple Macintosh, the IBM P.C. and every other computer that boasts Multiplan. Incredibly comprehensive, this spreadsheet can be used for any problem where multiple calculations need to be done. Particularly useful for "what if..." type problems.

To use Multiplan, you'll require disc system, and 32k R.A.M. A printer can be used but is not essential. **£74.95**

BASIC CONVERSION KIT

Advertised, withdrawn, advertised... what's going on with this program.

Arcade Hardware have acquired the rights to produce this program and manual. It is not a compiler in the true sense of the word, but a hand compiler. Enter Basic statements, look them up in the manual and convert them to the equivalent in assembly language. Slow, but faster than writing assembly off the top of your head. A knowledge of a processor language is useful to understand various concepts, but the demo disc will give examples of various instances.

System requirements are Editor/Assembler and hardware as for that software. **£24.95**

DISC REPAIR KIT

The was my first venture into software and is written in England! Someone took a look at the Navarone Disc Fixer module and said "I can do better than that". "Prove it", I said. Here is the result. Repairs blown directories and gives sector and track access. More user friendly than Navarones program with better features and a comprehensive instruction manual. **£19.95**

DRAW-A-BIT

The sensational program from one of the most prolific TMS9900 writers Dominic Melfi. Draw-a-Bit is a painting program, requiring 32k R.A.M. disc system and any one of Editor/Assembler, ExBas or Mini-Memory. Draw using cursor keys or joystick. Colour of ink and background can be changed at will, filling, circles, boxes, lines, etc. all done from keyboard commands. Sensibly priced, it's fun and a bargain. **£29.95**

NAVARONE DATABASE

The only program missing from T.I.s business line up is the Database. Navarone fulfill this in their usual fashion by doing an excellent program (supplied on disc and module) with an atrocious manual. In fact the manual is so bad, it's no help at all. But, if you're experienced in database type work, then I'm advised that this program is very good indeed. (It was a user who advised me, not a salesman.) Vastly more powerful than the P.R.K. it gives a sort by up to 6 keys and can be used to store almost any information at all. Recommended only for those with know-how on databases. **£65.00**

D.F.X. SCREEN DUMP

It's said that it's impossible to do a screen dump from Super Sketch. It can with the D.F.X. All you need in addition to your normal system of disc and 32k is a load interrupt switch. (Diagram in manual.) The D.F.X. can dump any picture the TI99/4A can produce to an Epson control code compatible printer. Also provided is a Sketch Filer, for dumping Super Sketch drawings to disc. **£24.95**

DATA FORCE 3 GAME PAK

3 machine code games on disc for the price of one module. Games are: D-Station. An asteroid type game Kippys Nightmare. Bang Bang Sub. A depth charge type game.

All games are written by Dominic Melfi. **£19.95**

T.I. LOGO II

This is the ultimate version of the "child appropriate language". Logo is based on geometric principles, but it's so easy to program that children aren't aware that whilst they are teaching Logo to do what they want, they're actually learning! A very clever program that can be considered an investment.

To use Logo II, you'll require 32k R.A.M. Programs can be saved to disc or cassette. **£74.95**

T.I. WRITER

Call for details.

CASSETTE BASED SOFTWARE

MOONBEAM All Moonbeam are ExBas

ASTROMANIA	£7.95	CAVERN QUEST	£7.95
ZERO ZONE	£7.95	ROBOT RUNNER	£7.95
GARBAGE BELLY	£7.95		

MOONBEAM OFFER — Buy 3 Moonbeam tapes pay £20.00.

KIPPY'S NIGHTMARE **£7.95**

Kippy requires Mini-Memory and Joystick no. 2. This program is now reliable!!!

SPACE STATION **£7.95**

Space Station requires ExBas and 32k R.A.M.

All prices fully inclusive of VAT and Postal Charges. Personal callers welcome, but please by appointment only.

NAVARONE CONSOLE WRITER £49.95

A word processor that doesn't require any peripherals other than a printer! Yes, this cartridge just plugs in and you can type away. Very little in the way of features, but the console writer is the answer to those who want to print a short letter on the TI99/4A without having to buy all the hardware necessary to run the TI-Writer. Files can be saved on tape or disc, and all files are compatible with TI-Writer should you later upgrade.

SPECIAL OFFERS ON GAMES!

- **Offer 1**

Buy 3 Imagic Games (Micro-Surgeon, Demon Attack, Moonsweeper, Fathom) and pay only £48.00. *Save £12.00.*

- **Offer 2**

Buy any 2 modules at £19.95 and pay £37.50.

- **Offer 3**

Buy any 3 modules at £19.95 and pay £56.00.

- **Offer 4**

Buy both Parker Brothers modules (Frogger and Q*Bert) and pay £45.00.

- **Offer 5**

Buy any 3 modules at £9.95 and pay only £27.50.

WATCH OUT!

FOR THORN-EMI's **COMPUTER WAR.**
Currently being manufactured under licence.
Available approx. August.

TI99/4A GAMES MODULES

MICRO-SURGEON	(Imagic)	£19.95
DEMON ATTACK	(Imagic)	£19.95
MOONSWEEPER	(Imagic)	£19.95
FATHOM	(Imagic)	£19.95
BUCK ROGERS	(Sega)	£19.95
STAR-TREK	(Sega)	£19.95
BIGFOOT	(MBX or console only)	£19.95
SUPERFLY	(MBX or console only)	£19.95
SPACE BANDITS	(MBX or console only)	£19.95
HONEY HUNT	(MBX or console only)	£19.95
SEWERMANIA	(MBX or console only)	£19.95
SOUNDTRACK TROL	(MBX or console only)	£19.95
METEOR BELT	(MBX or console only)	£19.95
ADVENTURE/PIRATE	(Module and tape)	£19.95
RETURN TO PIRATE ISLE	(Module only)	£19.95
FROGGER	(Parker Bros. Use Joyst 2)	£24.95
Q*BERT	(Parker Bros. Use Joyst 1)	£24.95
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MUNCHMAN		£ 9.95
T.I. INVADERS		£ 9.95
TOMBSTONE CITY		£ 9.95
CAR WARS		£ 9.95
CONNECT FOUR		£ 9.95
HOPPER		£14.95
INDOOR SOCCER		£ 9.95
ARCTURUS		~~£18.00~~ £38.00

KILLER CATERPILLAR 38-00

INFOCOM
ADVENTURES ON DISC

Probably the most expensive adventures around, they are also a bargain. An Infocom adventure is different to anything else available. Sensational and comprehensive packaging, with very clever story lines, Infocom adventures are more akin to being part of a novel than playing a game.

ZORK I

The great underground adventure begins here. You'll plunge far below the earth in search of the treasure of ZORK. **£39.95**

ZORK II

Expect the unexpected when you take on ZORK II. The wizard of Frobozz. More underground adventures. **£44.95**

ZORK III

The Dungeon Master is your test of wisdom and courage. Your odyssey culminates in an encounter with the Dungeon Master himself, and your destiny hangs in the balance. **£44.95**

The ZORK trilogy is in three separate parts. Each is a complete adventure in itself. It is not necessary to have played one, before moving to another.

HITCH HIKERS GUIDE TO THE GALAXY

This is INFOCOMs adventure of the book of the T.V. series. And don't think you'll be familiar with what's going on because you've seen it before! Play the role of Arthur Dent in Douglas Adams story! **£39.95**

CUT THROATS

Stuck on Hardscrabble island, your friend is murdered shortly after showing you a map of sunken treasure. Your "friends" need you to help recover the treasure since you're an experienced diver, but do you think they need you afterwards to help share it. **£39.95**

All INFOCOM adventures require disc system, 32k R.A.M. and ED/ASS, EXBAS or mini-memory.

Other titles have been ordered, you will be notified as they become available.

WITNESS

1938 Los Angeles. Hitler is rolling through Europe, but as Chief Detective, you've problems closer to home. One gilt edged society dame is dead. The only testimony you can trust is your own, because you are the WITNESS. **£39.95**

DEADLINE

Work to a 12 hour deadline from an actual crime dossier. One false move and the killer may strike again. And you may be the victim!! **£49.95**

SORCERER

A cryptic diary is all that remains in the sanctum of Belboz the Necromancer, grand and powerful leader of the guild of enchanter. To rescue the kingdom and locate your mentor you must gain the power and cunning of a true SORCERER. **£44.95**

INFIDEL

Lost in the Egyptian desert in search of the lost pyramid. Why. For science's sake, or do you have a personal motive? With vultures and other evils after you. Are you, THE INFIDEL up to this. **£44.95**

Howard writes again ! 2

R.A.M., disc controller and Printer outputs all working perfectly. Well not quite.....Some idiot had wired the disc cable hurriedly and had managed to wire the ribbon one line out of step. I don't know how he'd managed that, it's easier to do it right! But once I'd solved that mystery, I went on formatting discs in double density/double sided (gosh, you can save a fortune in discs, you only need a quarter as many!), and using the box as I would my own.

My opinion; once I'd overcome the oddball appearance, I was quite happy with the box. It's quieter and more capable. The ability to catalogue discs from Basic without the disc manager saves a lot of module swapping and it's also possble to use CALL LOAD, CALL INIT and CALL LINK without any module on board. I like it and when I've some spare cash, I'll trade my own system in for one. The construction isn't as solid as the T.I. Box, but that was always over engineered and that's not to say it's built to Sinclair standards. It's well made to perfectly adequate standards, by competent technicians.

CENTRONICS- It's all very good singing the praises of Myarc, but what about the poor souls who have a T.I. RS232 card and want to hook up to a Centronics compatible printer? As some of you may know, and for those who don't, I'm telling you, the T.I. RS232 card cannot access the better quality printers via the parallel port. Nosir! I've had trouble with this twice now, once with a Tandy printer and once with a Quendata daisywheel. On both occasions, the answer was a hardware mod, well outside the capabilities of anyone without access and the means to use, an oscilloscope. Now courtesy of Texas Instruments (U.K.), I can offer an easier solution. I have an EPROM which is to replace the PROM in the T.I. card. I can sell it for £10.00, or fit it for more. It isn't quite a direct replacement, there are a couple of links to be made on the card, but it's a lot simpler than cooking a circuit together from scratch. There is also another circuit explained by a gentleman from Centronics floating around. This works fine, but is constantly accessed which means a slight power drain on the card. It probably doesn't matter, but I do think a software solution is much neater than a hardware one.

News pours in on a daily basis. More news from Myarc. They've now realised what I'd considered a major flaw in their 128k card. i.e. That most people who have the box, already have the 32k card. Since the Myarc 128k is really a 32k card with 96k of R.A.M. disc tacked on, this is going to leave an awful lot of 32k cards surplus. Enter the solution. Make the 128k a full 128k of R.A.M. disc. It also has new software on board so in theory at the start of the day you could load up all the programs by copying them from the disc manager and then never need to load a disc until you wanted something saving permanently. Beats me why they didn't sling in a battery back-up as well. They seem to have done everything else. (Fiendishly clever people.) As if that's not enough, they've gone one better. It seems that the 128k card is upgradeable, so that when you run short of memory (*what, with 128k!*) the chips can be swapped to give a massive 512k. Can you think of what to do with a 560k TI99/4A ? *Give me time and I'll give you an answer.*

Anybody out there playing Cutthroats know how to get rid of McGinty, the mans being a pain in the neck. (And I keep getting stabbed!)

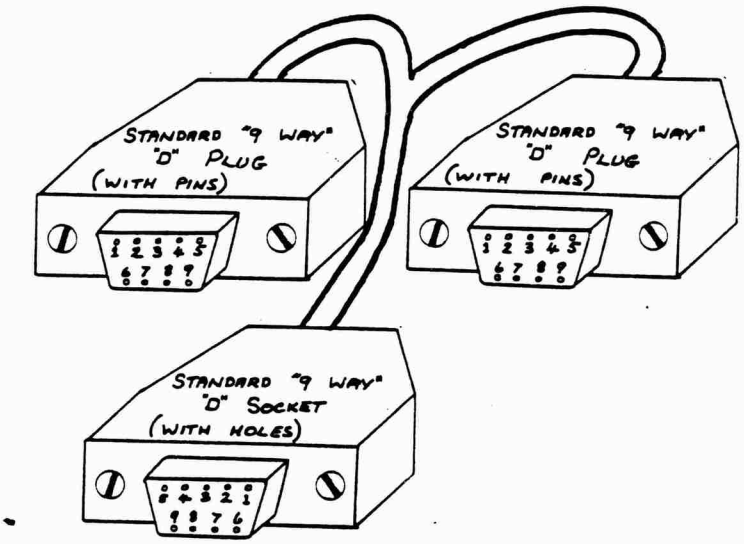
I'm restricting myself to a couple of pages, so that every word I write will be savoured and devoured. (By the dog?). So until next time.

BYE - Howard

D.I.Y. HARDWARE

by DEREK FORD

INTERFACE LEAD TO ADAPT ATARI (video computer) JOYSTICKS TO TEXAS T.I.99.4/A COMPUTER



Further Information.
T.I. Socket Wires
1 = ----------NOT USED
2 = (common) Joystick 1
3 = ----------UP
4 = ----------FIRE
5 = ----------LEFT
6 = ----------NOT USED
7 = (Common) Joystick.2
8 = ----------DOWN
9 = ----------RIGHT

For this conversion you need ONE '9 way D socket' and TWO '9 way D plugs ..NOTE the socket has holes (to insert into the T.I.) and the plugs have pins. The wiring bears no relevance between plugs and socket, because remember, Atari and Texas are totally different, so follow the diagram carefully. Note also that the plugs' terminals are numbered in a mirror image of the socket.So when wiring up ensure you have the right terminal. The socket/plugs are drawn with the 'business' end showing, to display the numbers.

T.I.SOCKET	PLUG (JOYSTICK.1.)	PLUG (JOYSTICK.2.)
ONE.	----------NOT USED.----------	
TWO.	EIGHT	
THREE.	ONE	ONE
FOUR.	SIX	SIX
FIVE.	THREE	THREE
SIX.	----------NOT USED. ----------	
SEVEN.		EIGHT
EIGHT.	TWO	TWO
NINE.	FOUR	FOUR

On the 'T.I.' socket.:
No. 2 terminal is the "common" for joystick 1 and is connected to terminal 8 ON joystick 1 plug.
No. 7 terminal is the "common" for joystick 2 and is connected to terminal 8 ON joystick 2 plug.
Terminals 3-4-5-8-9 each have two wires connected to them .One of each goes to the (plug) terminals 1-6-3-2-4 respectively on each joystick (plug).
On the "joystick" plugs , terminals 5-7-9 are not used.

When connected up, the joysticks will work exactly like Texas joysticks I.E. on modules like ALPINER or T.I.INVADERS, any joystick will work the screen. On other modules or cassette games that require two player action then the two joysticks work independently as they should (note use of ALPHA LOCK) .
Your Atari joysticks, when unplugged from the interface lead, will of course, still be compatible with your Atari video computer.

Memory Expansion

MEMORY NOTES

Due to a busy period at home,I mixed up publication dates,and so have not got any programs to write about.The theme for this issue is hardware,as for several months now I have been working on designs for memory expansion boards.

The first design,which will have been tested by the time that you receive this copy of TI*MES,is a 32k ram board which will fit inside the console,and will run off the internal power supply,which will be upgraded slightly.

This board is aimed at people who do not wish to expand their system to include disks,but want to be able to use Logo,Ex Bas (with assembly language or large programs),Mini Memory with large programs,or TIB with the MM to provide assembly language facilities, without carting around the large expansion box.(My system never goes anywhere,but is permanently set up, with the expansion box stifling any desire to move the system).It can be used even if an ExBox is coupled to the computer.

The most important point about the design is that the memory is attached to the 16 bit part of the data bus.This,when the built-in memory wait states are disabled,allows the memory accesses to be three times faster than before,and any programs making great use of the memory expansion will run three times faster.ExBas really will be faster than TIB,as TI originally claimed.

The cost of this board will be approximately the same as the normal TI board,but will avoid the cost of the expansion box.Any interested persons should contact me,as I will consider producing the board for sale if the demand is high enough.

The second design is for a multi-bank memory board,with up to 224k in three banks of 64k and the normal expansion bank of 32k,again on the 16 bit data bus.The design incorporates seperate bank switches for read and write,so that a program can read data from one bank,and write to another bank if desired.This is not possible in the designs that I have so far seen on the market.The banks can be used for storing data or programs.If one wished,it would be possible to load a suite of programs into the extra banks,switch to these programs,and need only use the original TI bank in order to write to the screen,but this could be done from the new bank by simply altering the write bank switch for that particular write operation.The design incorporates the facility to switch banks and then jump to the start of the desired routine,just as if one was carrying on in the original bank.This is not possible on other designs,use having to be made of a portion of memory which is always switched in,such as the cpu scratchpad ram.This leads to the segmented designs on sale at the moment,which have to follow the layout of the original TI memory board.

The second design also incorporates a LOAD interupt switch,with a hardware single-step feature which would allow the inspection of any routine anywhere in memory.This feature could also be incorporated in the smaller board.

As can be judged by the specification of the large board,it is for assembly language programmers only,and thus I do not envisage a great demand for this,but hope that I am wrong,as we need all the A-L programmers that we can get.

For those people with grand ideas of writing great programs to load into extra memory banks,thus replacing the original TI programs (who and where are these masochists?),it would be possible to further modify the original TI design,and decode the cpu scratchpad area more fully,and insert a new VDP chip,incorporating 80 column screen layout,in full colour,such as on the machine on which I am writing this article.It uses the same screen controller as the BBC,but provides 8 primary colours in 80 column mode,not two as in the Beeb.For those people looking for a more business-like screen layout,and not wishing to waste their investment this is a possibility,but not an easy one.I have spoken to several people who are already considering this option,so between us we may yet come up with a working design.

I hope this article has made people realise that while I have slated TI in the past for producing a design which has hamstrung the power of the 9900 processor,I still believe that certain improvements can be made to make the machine more powerful and portable,but I feel that I must make a comment about a VDP chip by TI that could possibly be incorporated into our machine and provide the kind of facilities outlined above:80 column or 40 column mode;high resolution mode of 512 x 192 pixels; 512 colours,with 16 colours displayable on each line;2 text modes;3 graphics modes;block movement of data in hardware;an on-chip sound generator.This wonder chip is the TMS9228,and some bright sparks in TI marketing have done it again by deciding that there will not be much of a market for it,and the chip has been withdrawn from the market.(Information provided by TI Bedford).I do hope that this decision is reconsidered(write to your MP and complain).

I hope that these few notes,dashed off in a frantic hour after Clive reminded me of the publication date,have whetted people's interest,and people are welcome to get in touch to discuss any of the above topics.

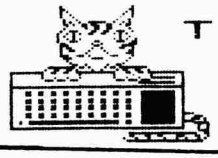
I have been contacted by the Swedish user group,who have supplied me with a version of Forth written by one of their members,which while not being as sophisticated as the TI version is very interesting.I hope to recieve the source code for this soon,as it has been placed in the public domain.My contact is Peter Odelryd,whom I spoke to recently,and he is a very helpful person.We agreed that links between our two groups should be strengthened,with exchanges of software and other information.As Clive asked me to get in touch with Peter and the Swedish group,I am willing to take some of the load from Clive's back,so please channel any enquiries on this matter through me.

The Forth can be used with the following modules with a tape system:Edas,ExBas,MM.These are available for a disk user,with the additional facility of being able to use the TI-Writer module.Similar facilities are available with the more professional package sold by Wycove Systems of Canada,and if anyone should feel like supporting a professional writer of software on the TI then they should buy a copy of this Forth if they do not have the disk system.I will pass on Wycove's address if anyone is interested.

Happy and fruitful computing.

PHILLIP MARSDEN

6 Kennerleigh Grove
LEEDS 15 Yorks.
LS15 8NQ



TIPS FROM TIGERCUB

Jim Peterson
TIGERCUB SOFTWARE
156 Collingwood Ave.,
Columbus OH 43213

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My new catalog #5 is now available for $1.00, which is deductable from your first order. It contains over 130 programs in Basic and Extended Basic at only $3.00 each (plus $1.50 per order for casette, packing and postage, or $3.00 for diskette, PP&M).

The entire contents of Tips from the Tigercub Nos. 1 through 14, with more added, are now available as a full disk of 50 programs, routines and files for only $15.00 postpaid.

Nuts & Bolts is a diskfull of 100 (that's right, 100!) XBasic utility subprograms in MERGE format, ready for you to merge into your own programs. Contents include 13 type fonts, 14 text display routines, 12 sorts and shuffles, 9 data saving and reading routines, 9 wipes, 8 pauses, 6 music, 2 protection, etc., etc., all for just $19.95 postpaid!

New programs -

TCX-1058 SCRUM, now available in Extended Basic. I'm told that this challenging puzzle-game has been programmed for other computers under the name Merlin. I haven't seen it, but I don't think you can beat my version - it's 511 puzzles in one!

TCX-1137 SOUNDMAKER, a very versatile utility program to develop sound effects, then save them in the form of actual program lines. Requires Extended Basic; disk only.

I must first thank all those newsletter editors and other users' group officers who are trying so hard to help me keep my kitchen table enterprise alive. One users group reprinted my entire catalog in their newsletter, another is putting it on their BBS, another made me an honorary life member, many others have mentioned and recommended my software in their newsletters.

Unfortunately, all that support hasn't helped very much. From reading the editorials in many newsletters, I can easily see that most users groups consist of a few dedicated hard-working individuals and a lot of.....well, frankly, freeloaders. And freeloaders don't buy software!

To borrow a few quotable quotes from the newsletters, "too many getters and not enough givers", and "users are users!". That is why users groups are fading away, software producers are going out of business, and the TI-99/4A will die before its time.

Here is probably the last word on the challenge to write a 1-line XBasic program which would scramble the numbers 1 to 255 into a random sequence without duplication. This one runs in 17 seconds!

```
100 ! FROM TISOFT (BELGIUM)
NEWSLETTER V.6 #4 JULY-SEPT
84 - ANONYMOUS
110 DIM R(255):: FOR I=0 TO
255 :: R(I)=I :: NEXT I :: F
OR I=0 TO 255 :: RANDOMIZE :
: CALL PEEK(-31808,J):: K=R(
J):: R(J)=R(I):: R(I)=K :: N
EXT I
120 FOR J=0 TO 255 :: PRINT
R(J);:: NEXT J
```

I believe that Craig Miller is due the credit for publishing the PEEK used in that routine. He also found a PEEK to get two random numbers, which I fooled around with until I discovered I had a mosquito trapped behind my TV screen.

```
100 ! MOSQUITO by Jim Peter
son from a PEEK by Craig Mil
ler
110 CALL CLEAR :: CALL SPRIT
E(#1,42,2,100,100)
120 RANDOMIZE :: CALL PEEK(-
31808,A,B):: CALL MOTION(#1,
A-128,B-128):: GOTO 120
```

If you're worried about the

mosquito getting out, you can put a screen on the window by adding a statement to line 110 - CALL CHAR(32,"FF888888FF888888")

Here's one for the kiddies -

```
100 REM - DANCING STICKMAN p
rogrammed by Jim Peterson
110 CALL CLEAR
120 DIM S(26),T(60),NN(60)
130 FOR CH=48 TO 80 STEP 8
140 CALL CHAR(CH,"000028107C
1028")
150 NEXT CH
160 GOSUB 590
170 FOR SET=3 TO 7
180 CALL COLOR(SET,1,1)
190 NEXT SET
200 DATA "  H  000  P","  H
 000  P","  H   0   P","  00
0000000","  8  000  @","  8
 000  @"
210 DATA " 88  000  @@","  H
HH000PPP","  H  8 @  P","  H
  8 @  P","HHH  8 @  PPP","
   8 @","     8 @","   888
@@@"
220 PRINT "     dancing stic
kman": : : :
230 RESTORE 200
240 FOR J=1 TO 14
250 READ A$
260 PRINT TAB(8);A$
270 NEXT J
280 CALL COLOR(3,16,5)
290 CALL COLOR(4,16,7)
300 CALL COLOR(5,5,16)
310 GOTO 690
320 ON INT(3*RND+1)GOSUB 340
,400,460
330 RETURN
340 CALL COLOR(4,1,1)
350 CALL COLOR(6,16,5)
360 GOSUB 560
370 CALL COLOR(6,1,1)
380 CALL COLOR(4,16,7)
390 RETURN
400 CALL COLOR(5,1,1)
410 CALL COLOR(7,16,7)
420 GOSUB 560
430 CALL COLOR(7,1,1)
440 CALL COLOR(5,7,16)
450 RETURN
460 CALL COLOR(4,1,1)
470 CALL COLOR(5,1,1)
480 CALL COLOR(6,16,5)
490 CALL COLOR(7,16,7)
500 GOSUB 560
510 CALL COLOR(6,1,1)
520 CALL COLOR(7,1,1)
530 CALL COLOR(4,16,7)
540 CALL COLOR(5,5,16)
550 RETURN
560 FOR D=1 TO 30
570 NEXT D
580 RETURN
590 F=262
600 FOR N=1 TO 25
610 S(N)=INT(F*1.059463094^N
)
620 NEXT N
630 S(26)=40000
640 RESTORE 740
650 FOR J=1 TO 60
660 READ T(J),NN(J)
670 NEXT J
680 RETURN
690 FOR J=1 TO 60
700 CALL SOUND(T(J)*100,S(NN
(J)),0,S(NN(J))+5,5)
710 GOSUB 320
720 NEXT J
730 GOTO 690
740 DATA 4,8,4,13,4,13,4,15,
4,17,4,13,4,17,4,15,4,12,4,1
3,4,13,4,15,4,17,8,13,4,12
750 DATA 4,8,4,13,4,13,4,15,
4,17,4,18,4,17,4,15,4,13,4,1
2,4,8,4,10,4,12,8,13,4,13,4,
26
760 DATA 4,10,4,12,4,10,4,9,
4,10,4,12,8,13,4,8,4,10,4,8,
4,6,4,5,4,6,8,8
770 DATA 4,10,4,12,4,10,4,9,
4,10,4,12,4,13,4,10,4,8,4,13
,4,12,4,15,8,13,4,13,4,26
```

& @ & @

John Hamilton of the Central Iowa Users Group will send you his 22-page booklet of "99 Tips" for the TI-99/4A, for just $4.00. The address is

John Hamilton, 4228 E. Clinton, Des Moines IA 50317. USA.

I understand that there a couple of kids who wait for every issue (of TIPS) so that their dad can key them in a bit of nonsense from the Tigercub, so -

```
100 !KEYZAP - by Jim Peterso
n
110 DISPLAY AT(6,11)ERASE AL
L:"KEYZAP" :: DISPLAY AT(12,
1):"   Zap the Zprite by typ
ing the key in the correspon
dingposition on the keyboard
120 DISPLAY AT(24,10):"Press
 any key" :: CALL KEY(0,K,S)
:: IF S=0 THEN 120
130 RANDOMIZE
140 CALL CHAR(47,"817EA58199
A5423C")
150 CALL CLEAR :: T=0 :: CAL
L FLASH(T)
160 CALL KEY(3,K,ST):: IF ST
=0 THEN 180
170 C=C+1 :: IF C=101 THEN 1
90 ELSE CALL KEYBOARD(K,T)
180 CALL MOTION(#1,25*RND-25
*RND,25*RND-25*RND):: CALL C
OINC(#1,#2,16,A):: IF A=0 TH
EN 160 ELSE CALL FLASH(T)::
GOTO 160
190 CALL DELSPRITE(ALL):: DI
SPLAY AT(12,9):"GAME OVER" :
: DISPLAY AT(14,9):"SCORE";T
 :: DISPLAY AT(16,9):"PLAY A
GAIN?"
200 CALL KEY(3,K,S):: IF S<1
 THEN 200
210 IF K=89 THEN C=0 :: GOTO
 150 ELSE END
220 SUB KEYBOARD(K,T)
230 IF FLAG=1 THEN 250 :: FL
AG=1
240 KEY$="1234567890=QWERTYU
IOP/ASDFGHJKL;"&CHR$(13)&"ZX
CVBNM,."
250 IF (K=47)+(K=61)+(K=13)T
HEN SUBEXIT ELSE X=POS(KEY$,
CHR$(K),1):: Y=ABS(X>11)-(X>
22)-(X>33)+1 :: R=Y*6 :: C=(
(X+(Y>1)*(Y-1))*3)
260 CALL SPRITE(#2,42,16,R*8
-7,C*8-7):: CALL COINC(#1,#2
,16,N):: IF N=0 THEN SUBEXIT
270 CALL FLASH(T):: SUBEND
280 SUB FLASH(T):: FOR W=1 T
O 10 :: CALL SCREEN(16):: CA
LL SCREEN(8):: NEXT W :: CAL
L SPRITE(#1,47,2,1,1):: T=T+
1 :: DISPLAY AT(1,20):T :: S
UBEND
```

And here's another -

```
100 ! QUICK  DIRTY DOODLER
    by Jim Peterson
Use joystick #1. Press fire
button to change color or
pattern, Enter to clear the
screen.
110 DATA FFFFFFFFFFFFFFFF,FF
,0101010101010101,0000000000
0000FF,8080808080808080,01020
4081020408,8040201008040201,
FF8181818181FF
120 CALL CLEAR :: FOR J=1 TO
 8 :: READ CH$(J):: NEXT J
130 FOR CH=32 TO 136 STEP 8
:: FOR CN=CH TO CH+7 :: X=X+
1 :: CALL CHAR(CN,CH$(X)):: 
NEXT CN :: X=0 :: NEXT CH ::
 CALL CHAR(32,"0")
140 CALL SCREEN(16):: FOR S=
2 TO 14 :: CALL COLOR(S,S+1,
1):: NEXT S :: R=12 :: C=16
:: CH=33
150 CALL HCHAR(R,C,CH):: CAL
L FASTJOY(C,R,Q):: IF Q=18 T
HEN CH=CH+1+(CH=143)0
160 CALL KEY(0,K,S):: IF K=1
3 THEN CALL CLEAR :: GOTO 15
0 ELSE 150
170 SUB FASTJOY(C,R,Q):: CAL
L JOYST(1,X,Y):: CALL KEY(1,
Q,S):: X=SGN(X):: Y=-SGN(Y):
: C=C+X+(C=32)-(C=1):: R=R+Y
+(R=24)-(R=1):: SUBEND
```

And a pretty one -

```
100 CALL CLEAR :: CALL SCREE
N(2):: FOR S=2 TO 8 :: CALL
COLOR(S,15,1):: NEXT S :: DI
SPLAY AT(12,7):"KALEIDOSQUAR
ES" ! by Jim Peterson
110 FOR CH=40 TO 136 STEP 8
:: FOR L=1 TO 4 :: RANDOMIZE
 :: X$=SEG$("0018243C425A667
E8199A5BDC3DBE7FF",INT(16*RN
D+1)*2-1,2)
120 B$=B$&X$ :: C$=X$&C$ ::
NEXT L :: CALL CHAR(CH,B$&C$
):: B$,C$=NUL$ :: NEXT CH
130 FOR S=2 TO 14 :: X=INT(1
5*RND+2)
140 Y=INT(15*RND+2):: IF (Y=
X)+(Y=8)THEN 140
150 CALL COLOR(S,X,Y):: NEXT
 S
160 AR,R,AVR,VR=1 :: AC,C,AH
C,HC=4 :: TT=24 :: XX,XT=13
170 FOR L=1 TO 12 :: T=TT ::
 XT=XX :: R=AR :: VR=AVR ::
```

```
C=AC :: HC=AHC
180 FOR J=1 TO XT :: X=INT(1
3*RND+2)*8+24 :: CALL HCHAR(
R,HC,X,T):: CALL HCHAR(25-R,
HC,X,T):: CALL VCHAR(VR,C,X,
T)
190 CALL VCHAR(VR,31-C,X,T):
: T=T-2 :: HC=HC+1 :: VR=VR+
1
200 NEXT J :: AR=AR+1 :: AVR
=AVR+1 :: AC=AC+1 :: AHC=AHC
+1 :: TT=TT-2 :: XX=XX-1 ::
NEXT L
210 IF INT(2*RND)<>0 THEN 23
0
220 FOR S=INT(12*RND+2)TO 14
 :: CALL COLOR(S,1,1):: NEXT
 S
230 FOR J=1 TO INT(20*RND+1)
:: S=INT(13*RND+2):: X=INT(1
5*RND+2):: Y=INT(15*RND+2)::
 CALL COLOR(S,X,Y):: NEXT J
240 CALL SCREEN(INT(15*RND+2
)):: ON INT(5*RND+1)GOTO 130
,160,220,230,240
```

In an early edition of Tips the challenge was - how can you store a hundred or more values of any size, positive or negative, integer or non-integer, even in exponential notation, without dimensioning an array or opening a file, and then link to another program with a RUN statement and recover those values - not by reading them from the screen? I had just one reply! Was it too easy, too hard, or doesn't anyone care? Anyway -

```
20591 SUB CHARSAVE2(CH,N)::
N$=STR$(N):: N$=RPT$("0",16-
LEN(N$))&N$
20592 IF POS(N$,".",1)=0 THE
N 20593 :: N$=SEG$(N$,1,POS(
N$,".",1)-1)&"A"&SEG$(N$,POS
(N$,".",1)+1,LEN(N$))
20593 IF POS(N$,"+",1)=0 THE
N 20594 :: N$=SEG$(N$,1,POS(
N$,"+",1)-1)&"B"&SEG$(N$,POS
(N$,"+",1)+1,LEN(N$))
20594 IF N<0 THEN N$=SEG$(N$
,1,POS(N$,"-",1)-1)&"F"&SEG$
(N$,POS(N$,"-",1)+1,LEN(N$))
20595 CALL CHAR(CH,N$):: SUB
END
```

And to recover the values -

```
20596 SUB READCHAR(CH,N):: C
ALL CHARPAT(CH,CH$)
20597 IF POS(CH$,"A",1)=0 TH
EN 20598 :: CH$=SEG$(CH$,1,P
OS(CH$,"A",1)-1)&"."&SEG$(CH
$,POS(CH$,"A",1)+1,LEN(CH$))
20598 IF POS(CH$,"B",1)=0 TH
EN 20599 :: CH$=SEG$(CH$,1,P
OS(CH$,"B",1)-1)&"+"&SEG$(CH
$,POS(CH$,"B",1)+1,LEN(CH$))
20599 IF POS(CH$,"F",1)<>0 T
HEN CH$="-"&SEG$(CH$,POS(CH$
,"F",1)+1,LEN(CH$))
20600 N=VAL(CH$):: SUBEND
```

Here's a jewel of a routine from Danny Michael, to avoid those lockups and other foul-ups that occur when you CALL INIT after you have already CALLed INIT - CALL PEEK(8198,A):: IF A<>17 0 THEN CALL INIT

The best way to edit a program is to type NUM and the first line number, then Enter will take you through line by line with no danger of accidentally deleting a line. The edit functions will still work, and FCTN 4 gets you out of the NUM mode.

Designing downloadable characters for the Gemini printer (see page 115 of the manual) is a bit tricky because it is hard to visualize how the expanded pattern will appear in print. The following program will enable you to experiment with designs, dump them directly to the printer for viewing, then save them as a file. When you later dump this file into printer RAM for use, you must activite the download characters with the escape code -

```
CHR$(27);CHR$(36);CHR$(1).
```

```
100 CALL CLEAR :: CALL SCREE
N(4):: CALL CHAR(128,"FF8181
81818181FF",129,RPT$("F",16)
):: CALL COLOR(13,2,16)
110 FOR R=9 TO 15 :: CALL HC
HAR(R,11,128,9):: NEXT R
120 X=1 :: FOR R=9 TO 15 ::
DISPLAY AT(R,7)SIZE(2):STR$(
X):: X=X*2 :: NEXT R :: FOR
C=9 TO 17 :: DISPLAY AT(8,C)
SIZE(1):STR$(C-8):: NEXT C
```

```
130 DISPLAY AT(2,9):"TIGERCU
B'S" :: DISPLAY AT(4,1):"GEM
INI CHARACTER DOWNLOADER" !p
rogrammed by Jim Peterson fo
r the Public Domain
140 DISPLAY AT(17,1):" Move
cursor with W,E,R,S,D,":"Z,X
 and C keys. Toggle on":"and
 off with Q key. Press":"Ent
er when finished.": : :"Pres
s any key"
150 CALL KEY(0,K,ST):: IF ST
=0 THEN 150 :: CALL HCHAR(17
,1,32,224)
160 R=9 :: C=11 :: CH=128
170 CALL HCHAR(R,C,32):: CAL
L HCHAR(R,C,CH):: FOR D=1 TO
 10 :: NEXT D :: CALL KEY(3,
K,ST):: IF ST=0 THEN 170
180 ON POS("QWERDCXZS"&CHR$(
13),CHR$(K),1)+1 GOTO 170,31
0,230,220,210,200,190,260,25
0,240,330
190 R=R+1
200 C=C+1 :: GOTO 270
210 C=C+1
220 R=R-1 :: GOTO 270
230 R=R-1
240 C=C-1 :: GOTO 270
250 C=C-1
260 R=R+1
270 R=R-(R<9)+(R>15):: C=C-(
C<11)+(C>19):: IF CH=128 THE
N 300 :: CALL GCHAR(R,C-1,GX
):: CALL GCHAR(R,C+1,GZ):: I
F (GX<>129)*(GZ<>129)THEN 30
0
280 DISPLAY AT(22,1):"You ca
n't have two in a row":"hori
zontally!" :: FOR D=1 TO 50
:: NEXT D :: DISPLAY AT(22,1
):" ":" "
290 CH=CH-1
300 CALL HCHAR(R,C,CH):: GOT
O 170
310 CH=CH+1+(CH=129)*2 :: IF
 CH=128 THEN 320 :: CALL GCH
AR(R,C-1,GX):: CALL GCHAR(R,
C+1,GZ):: IF (GX<>129)*(GZ<>
129)THEN 320 ELSE 280
320 CALL HCHAR(R,C,CH):: GOT
O 170
330 FOR C=11 TO 19 :: X=1 ::
 FOR R=9 TO 15 :: CALL GCHAR
(R,C,G)
340 IF G=129 THEN A=A+X
350 X=X*2 :: NEXT R
360 FOR J=1 TO LEN(STR$(A)):
 : CALL VCHAR(15+J,C,ASC(SEG$
(STR$(A),J,1))):: NEXT J ::
M$=M$&CHR$(A):: A=0 :: NEXT
C :: A=0
370 DISPLAY AT(20,1):"Print?
 Y/N Y" :: ACCEPT AT(20,12)V
ALIDATE("YN")SIZE(-1):Q$ ::
IF Q$="N" THEN 470
380 IF F=1 THEN 390 :: F=1 :
: DISPLAY AT(20,1):"Printer
name?" :: ACCEPT AT(20,15):P
$ :: OPEN #1:P$
390 DISPLAY AT(20,1):"ASCII
to redefine?" :: ACCEPT AT(2
0,20)VALIDATE(DIGIT)SIZE(3):
CH
400 DISPLAY AT(20,1):"Descen
der (0 or 1)? 0" :: ACCEPT A
T(20,21)VALIDATE("01")SIZE(-
1):D$ :: D=VAL(D$)
410 M$=CHR$(27)&CHR$(42)&CHR
$(1)&CHR$(CH)&CHR$(D)&M$
420 PRINT #1:M$ :: PRINT #1:
CHR$(27);CHR$(36);CHR$(1);
430 PRINT #1:RPT$(CHR$(CH),7
2):: PRINT #1:CHR$(14);RPT$(
CHR$(CH),36)
440 DISPLAY AT(20,1):"Save (
Y/N)? Y" :: ACCEPT AT(20,13)
VALIDATE("YN")SIZE(-1):Q$ ::
 IF Q$="N" THEN 470
450 IF F3=1 THEN 460 :: F3=1
 :: DISPLAY AT(20,1):"Filena
me? DSK" :: ACCEPT AT(20,14)
:F$ :: OPEN #2:"DSK"&F$
460 PRINT #2:M$
470 M$="" :: DISPLAY AT(20,1
):"Another (Y/N)? Y" :: ACCE
PT AT(20,16)VALIDATE("YN")SI
ZE(-1):Q$ :: IF Q$="Y" THEN
100
480 CLOSE #1 :: CLOSE #2 ::
END
```

Micropendium ran a contest to improve on a brief ingenious organ program. The winner was Michael Christianson, who wrote a superb program. You'll have to buy the January issue of the magazine to get it (you should be subscribing, anyhow!). I didn't enter the contest, of course, and my version is not nearly as good, but have fun -

```
90 CALL CLEAR
95 PRINT TAB(5);"MICROPENDIU
M ORGAN": : : : : : : :"Pl
```

```
ay bass with left hand": :"o
n left side of keyboard,": :
"melody on the right": : :
100 REM - MICROPENDIUM ORGAN
 modified by Jim Peterson
110 OPTION BASE 0
120 DIM NOTE(20)
130 FOR A=0 TO 20
140 READ NOTE(A)
150 NEXT A
160 DATA 40000,220,247,262,2
94,330,349,392,440,494,523,5
87,659,698,784,880,988,1047,
1175,1319,1397
170 CALL KEY(1,K1,S)
180 CALL KEY(2,K2,S)
190 CALL SOUND(-1000,NOTE(K2
+1),0,NOTE(K2+1)*1.01,5,NOTE
(K1+1)*3.75-ABS(K1+1=0)00
00,30,-4,0+ABS(K1+1=0))
200 GOTO 170
```

A sprite routine that doesn't do anything but look pretty. I call it Patches.

```
50 CALL CLEAR :: CALL SCREEN
(5)
100 A$=RPT$("AA55",16):: B$=
RPT$("F",64):: CALL MAGNIFY(
4):: RANDOMIZE
110 FOR CH=40 TO 136 STEP 8
:: CALL CHAR(CH,A$,CH+4,B$):
: NEXT CH
120 C=2 :: S=40 :: R=1 :: FO
R T=1 TO 24 STEP 2 :: COL=15
0*RND+50 :: CALL SPRITE(#T,S
,C,R,COL,#T+1,S+4,C+1,R,COL)
:: S=S+8 :: C=C+1 :: R=R+15
:: NEXT T
140 FOR T=1 TO 50 :: CALL CO
LOR(#INT(24*RND+1),INT(16*RN
D+1)):: NEXT T :: GOTO 120
```

This is one that I fancied up, based on a sprite routine written by a youngster named Andrew Sorenson, published in the Sydney Newsdigest from Australia.

```
100 ! WILL O' WISP
      by Jim Peterson
       based on
       Andrew Sorensen's
       sprite routine
110 CALL CLEAR :: CALL SCREE
N(2):: CR=48
120 FOR CH=48 TO 63 :: FOR L
=1 TO 4 :: RANDOMIZE :: X=IN
T(16*RND+1)*2-1 :: X$=SEG$("
0018243C425A667E8199A5BDC3DB
E7FF",X,2):: B$=B$&X$ :: C$=
X$&C$ :: NEXT L :: CALL CHAR
(CH,B$&C$):: B$,C$="" :: NEX
T CH
130 FOR N=1 TO 28 :: CALL SP
RITE(#N,CR,INT(14*RND+3),8*N
+20,120,5,0):: NEXT N :: IF
CR=64 THEN CR=48 :: T=T+1+(T
=2)*2 :: CALL MAGNIFY(T)
140 X=(INT(3*RND)-1)*4 :: Y=
(INT(3*RND)-1)*4
150 IF INT(10*RND+10)<>10 TH
EN 170
160 CR=CR+1 :: GOTO 130
170 FOR N=1 TO 28 :: CALL MO
TION(#N,-Y,X):: NEXT N
 :: GOTO 140
```

Here are a few more enhancements to my DISK MENU LOADER, published in TI*MES ISSUE 7. Delete line 150 and add

```
101 OPTION BASE 1 :: DIM PG$
(127):: ON WARNING NEXT :: G
OTO 110
105 @,A,A$,B,C,D$,FLAG,I,J,K
,KD,KK,N$,NN,P$,PG$(),Q$,S,S
T,T$(),TT,VT,X
CALL INIT :: CALL LOAD :: CA
LL LINK :: CALL PEEK :: CALL
 KEY :: CALL SCREEN :: CALL
COLOR :: CALL CLEAR :: CALL
VCHAR :: CALL SOUND :: !@P-
```

The pre-scan will speed up run time by a worthwhile amount. The warning default will prevent a screen scroll on an erroneous Enter.

When you're finished printing strip labels, cut off the strip BEHIND the platen and roll it FORWARD! you will waste few labels that way, but if you try to roll backwards and get a gummy label stuck in the works, you have got trouble!

I used to sign off with "happy hackin'", but the vandals and thieves have made hacking a disreputable word, so
Meeowww

SKETCH WITH MINIMEM

JOY SKETCH.

by SID MICHEL.

Joy sketch is a machine code program for the mini memory and uses joystick #1 to direct a pen around a BIT MAP mode screen. 14 colours are available(black and transparent not visible on black paper)

INSTRUCTIONS.

Using TI BASIC enter the program then SAVE it to tape/disc. RUN the program. If you make a typing error in a DATA statement the checksum will be incorrect and the MINI MEMORY will be cleared. When you see DATA CORRECT on the screen the code will have been correctly POKED into the memory. You may now QUIT TI BASIC.

RUNNING JOY SKETCH.

Select the RUN option from the mini memorys menu. When asked for PROGRAM NAME type SKETCH. Then press ENTER. Now raise the ALPHA LOCK. A pen will appear on the screen. You may direct the pen around the screen using the joystick.

SHAPE OF PEN DOWN ---->

CHANGING COLOUR.

Pressing the joystick FIRE button will step you sequentially through colours 3 to 16.

ERASING.

Step through the colours as described above. When you reach white (colour 16),press the fire button once more and the eraser wil appear.

SHAPE FOR ERASER ---->

This may be directed around the screen erasing as you go.

PEN UP.

After the eraser pressing FIRE once more changes the pen on the screen to represent pen up.

SHAPE FOR PEN UP ---->

The UP pen may be freely moved about the screen without leaving a trace.

CLEARING THE SCREEN.

Press 'C' on the keyboard.

SAVING PICTURES.

Sorry pictures created may not be saved. (ED: If you have expansion this line could be used to DUMP a screen, please let us have your ideas to enable use of use PIO).

NB: This program keeps the kids quiet for hours.

All the best,

Sid Michel.

```
 10 REM  JOY-SKETCH.
 20 REM  BY S.MICHEL.
 30 REM     MAY 1985 (C)
 40 REM  SINGLE PIXEL DRAWING

 50 REM  PROGRAM IN BIT-MAP
 60 REM   MODE.REQUIRES
            MIMIMEM
 70 REM  AND JOYSTICK #1.
 80 REM
 90 REM
100 REM  *DO NOT RESEQUENCE*

110 REM  *THIS PROGRAM*
120 REM
130 REM
140 REM   ** LINE 570 **
150 REM  THE FIRST 2 NUMBERS

160 REM   THIS LINE
          WILL CONTROL
170 REM   THE SPEED OF
            THE PEN
180 REM  0=FASTEST
190 REM  255=SLOWEST
200 REM   THE FIRST
            NUMBER IS
210 REM   THE COURSE
            AJUSTMENT
220 REM   THE SECOND
            IS THE
230 REM    FINE ADJUSTMENT.
          (8.0 IS THE
240 REM  DEFAULT SETTING)
```

```
250 REM
260 CALL CLEAR
270 PRINT "P R O G R A M  L
O A D I N G":::::::
280 CALL INIT
290 LOC=32000
300 I1=3
310 GOSUB 680
320 LOC=32122
330 I1=26
340 GOSUB 680
350 CALL LOAD(32752,83,75,69
,84,67,72,125,122)
360 CALL LOAD(28700,127,114,
127,224)
370 PRINT "     *CHECKSUM CO
RRECT*":::::" ensure program
is SAVEd":"before proceeding
.":::::
380 STOP
390 DATA 128,112,104,71,39,2
5,26,29,128,127,64,64,64,64,
64,127,192,192,32,16,50,1668
400 DATA 8,4,2,1,0,2,1,224,2
,6,3,255,4,3,5,54,6,3,7,23,6
0,613
410 DATA 255,255,0,45,0,143,
255,255,0,192,1,0,112,0,0,0,
0,0,0,0,70,1513
420 DATA 2,224,131,32,2,2,12
5,24,6,160,126,108,2,0,24,0,
4,194,4,193,100,1363

430 DATA 6,193,4,32,96,36,6,
193,5,129,5,128,2,129,1,0,17
,247,5,130,110,1364
440 DATA 2,130,0,3,17,242,4,
192,4,193,2,2,24,0,6,160,126
,120,2,0,120,1229
450 DATA 32,0,2,1,0,0,2,2,24
,0,6,160,126,120,2,0,7,17,4,
32,130,537
460 DATA 96,52,2,1,1,0,200,1
,131,116,4,32,96,32,192,160,
131,118,6,160,140,1531
470 DATA 126,136,104,3,125,4
2,6,194,6,160,126,136,168,3,
125,44,6,160,126,174,150,197
0
480 DATA 4,193,208,96,131,12
4,19,5,2,129,99,0,19,205,6,1
60,126,236,6,160,160,1928
490 DATA 127,0,6,160,126,164
,4,193,208,96,125,52,2,129,1
6,0,19,218,192,32,170,1869
500 DATA 125,44,192,96,125,4
2,193,1,10,84,225,1,2,68,255
,7,161,0,2,64,180,1697
510 DATA 0,7,97,0,2,3,128,0,
11,3,192,4,4,32,96,44,216,32
,125,52,190,1048
520 DATA 125,52,19,15,224,67
,4,32,96,36,2,32,32,0,4,32,9
6,44,136,1,200,1049
530 DATA 125,52,19,4,208,96,
125,52,4,32,96,36,16,180,64,
67,4,32,96,36,210,1344
540 DATA 16,176,192,50,17,3,
4,32,96,52,16,251,4,91,4,32,
96,36,16,2,220,1186
550 DATA 216,1,140,0,6,2,22,
252,4,91,4,193,2,3,255,253,2
08,66,19,7,230,1744
560 DATA 192,65,17,2,2,35,0,
2,2,35,0,2,4,91,4,195,16,253
,2,8,240,927
570 DATA 8,0,6,8,22,254,4,91
,136,32,125,42,125,46,21,3,4
,193,200,1,250,1321
580 DATA 125,42,136,32,125,4
2,125,48,17,4,2,1,0,191,200,
1,125,42,136,32,260,1426590
DATA 125,44,125,46,21,3,4,19
3,200,1,125,44,136,32,125,44
,125,50,17,4,270,1464
600 DATA 2,1,0,255,200,1,125
,44,4,91,4,193,208,96,125,52
,9,65,2,33,280,1510
610 DATA 1,0,10,65,216,1,125
,52,4,91,4,195,208,224,125,5
2,22,3,2,1,190,1401
620 DATA 125,8,16,8,2,131,16
,0,22,3,2,1,125,16,16,2,2,1,
125,0,300,621
630 DATA 2,2,0,8,2,0,27,128,
4,32,96,40,192,224,125,44,19
2,160,125,42,310,1445

640 DATA 6,2,6,194,208,194,4
,196,209,32,125,52,2,132,16,
0,27,2,2,4,320,1413
650 DATA 240,0,9,196,2,36,11
2,0,2,5,208,0,2,0,27,0,2,1,1
31,38,330,1011
660 DATA 2,2,0,6,4,32,96,40,
192,96,131,116,2,129,1,14,22
,2,2,11,340,900
670 DATA 125,122,4,91,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,35
0,342
680 FOR I=1 TO I1
690 TOT=0
700 FOR A=1 TO 10
710 READ X,Y
720 TOT=TOT+X+Y
730 CALL LOAD(LOC,X,Y)
740 LOC=LOC+2
750 NEXT A
760 READ X,Y
770 IF Y<>TOT THEN 800
780 NEXT I
790 RETURN
800 CALL INIT
810 CALL SOUND(500,330,0)
820 PRINT "* mistake in data
: line";X;"*"
830 END
```

TI99/4a Hardware reset....Part two- by Viv Comely

The operation involves some considerable dismantling of the console, and although this is fairly straightforward should not be attempted if you are unsure of your ability. The procedure should be carrid out on a good size, uncluttered table, such as the kitchen table. All screws should be carefully kept, noting where they came from. Preferably have a linen cloth on the table to reduce the chance of slipping. Also follow precautions to prevent static building up on the body, (i.e. no nylon carpets etc.). It can often be found helpful to draw sketches during the dismantling process to aid reassembly.

Have the following tools and components to hand before starting.

Soldering iron, preferably a low voltage type.
Solder, miniature pliers, cutters, phillips headed screwdriver.
Miniature momentary push-to-make switch. 560 ohm, 1/4 watt, 10 % tolerance resistor.
Approximately 3ft of insulated connecting wire. This is fairly thin stuff suitable for interconnecting pcb's. Preferably single core (not stranded). Not as thick as two core lighting flex which is not really suitable.
Sleeving, preferably heat resistant type.
Small tube of silicon heat conducting compound. May be a trifle expensive, especially as only a small amount required, but it is necessary.

All of the above items should be available from an electronic component shop.
The following steps and diagrams give the method required for fitting the reset switch. This is the process that I have carrid out on the 99/4a. I do not know if it applies to the 99/4 as modifications will have been incorporated in the /4a. If the layout in your console does not agree fairly closely with the diagrams do not attempt the modification.

1 Remove any cartridges from GROM port.
2 Remove all connections to console, i.e. power supply, joysticks, etc.
3 Turn console upside down. Locate and remove the seven phillips headed self tapping screws holding the two halves of the plastic case together.
4 The on-off switch has a plastic 'T'-piece slider which slides into the switch assembly. The top of the 'T' forms the part of the slide switch visible on the front of the console. This must be removed, but is awkward as the 'T'-piece clicks into position, and I have only removed it by dint of careful fiddling. Remove the plastic base of the console.
5 Remove the screws as indicated in figure 1, to release the three printed circuit boards. Note that the main board has metal screens fitted to both sides.
6 Slide up the power inlet socket on the rear of the case, and lift out the power supply regulator board, removing the 4 pin plug at the rear of the board. Note that this plug has a locking bar which must be pressed to release the plug. Retain the plastic switch slider fitted underneath the power on-off switch. This will be left in position after the pcb (printed circuit board) is lifted out. Notice how it is fitted to aid reassembly.
7 Put power supply regulator board on one side.
8 Lift up main board (figure 1) sufficiently to allow the removal of the long plug mounted on top (underside in present view). This plug connects the keyboard to the main board.
9 Lift the main board clear. It is not necessary to remove the keyboard, but it will be found helpful on reassembly if it is left loose for the time being.
10 Note how the two clips and three nut and bolt assemblies retain the two metal shields to the main board. Also notice which side of the board the nuts are, as the main pcb will not sit into place on reassembly if they are refitted on the wrong side.
11 Locate the GROM port socket and small pcb mounted on top of the main pcb. This plugs into a socket on the main pcb and must be removed by gentle pulling. Before removing however, note the direction in which the GROM port socket faces, to aid reassembly.
12 Remove the two clips and the three nut/bolt/washer assemblies fixing the shields to the main board, (figure 2).
13 Lift off the screens. Note that the underside screen fits over the expansion port connections and needs to be slid sideways slightly to clear them.
14 Note the heat conducting contact on the other shield. This is smeared with white heat conducting compound, and when the shield is in place presses upon the video processor chip, which also has a smear of heat conducting compound on its surface. This aids dissipation of heat from this chip. The heat conducting compound must be renewed on reassembly.
15 Place the board in front of you, component side upwards and with the expansion socket on the right. Refer to figure 3 to identify some of the components.

FIGURE 1. Underside view of console with base removed.

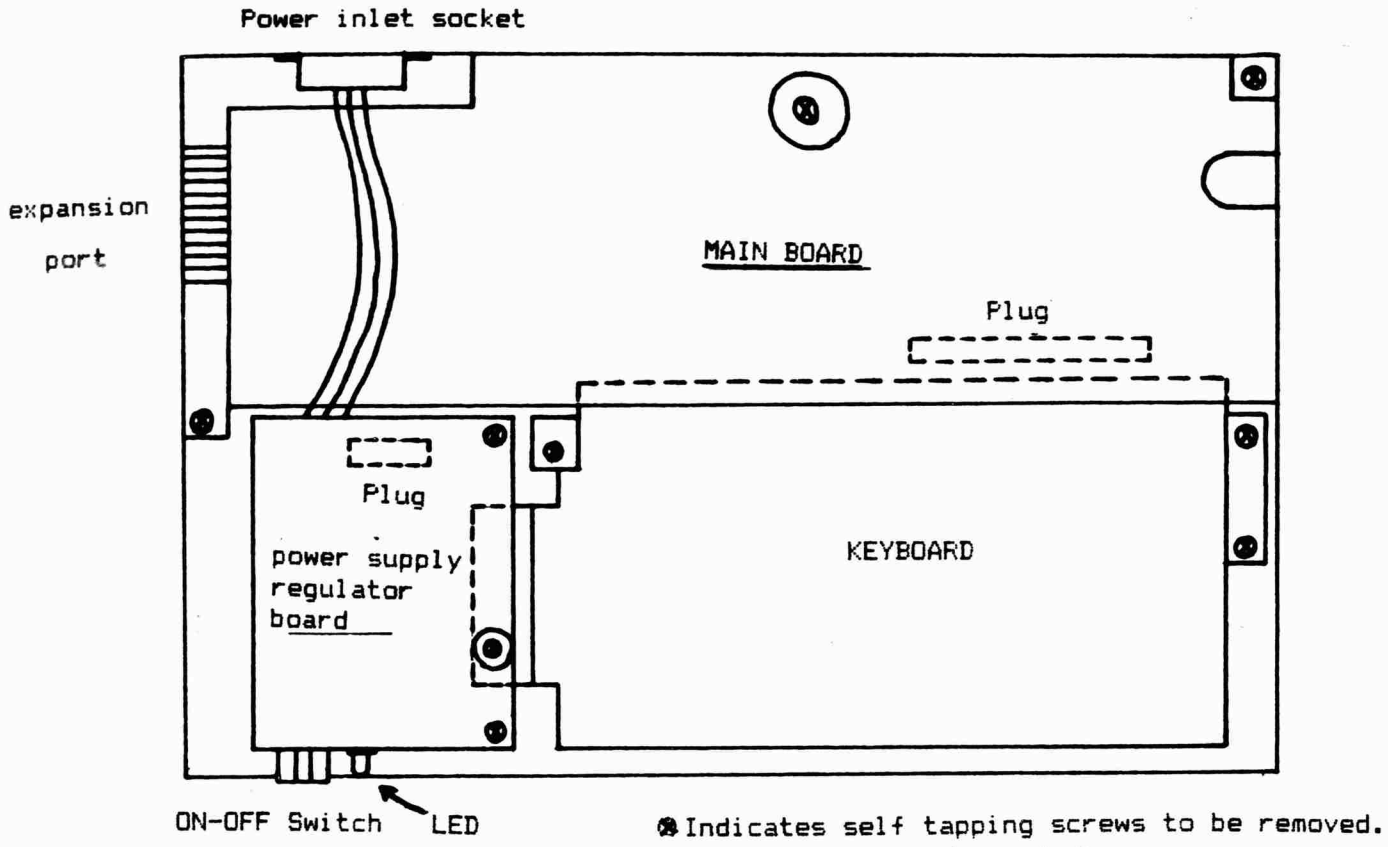
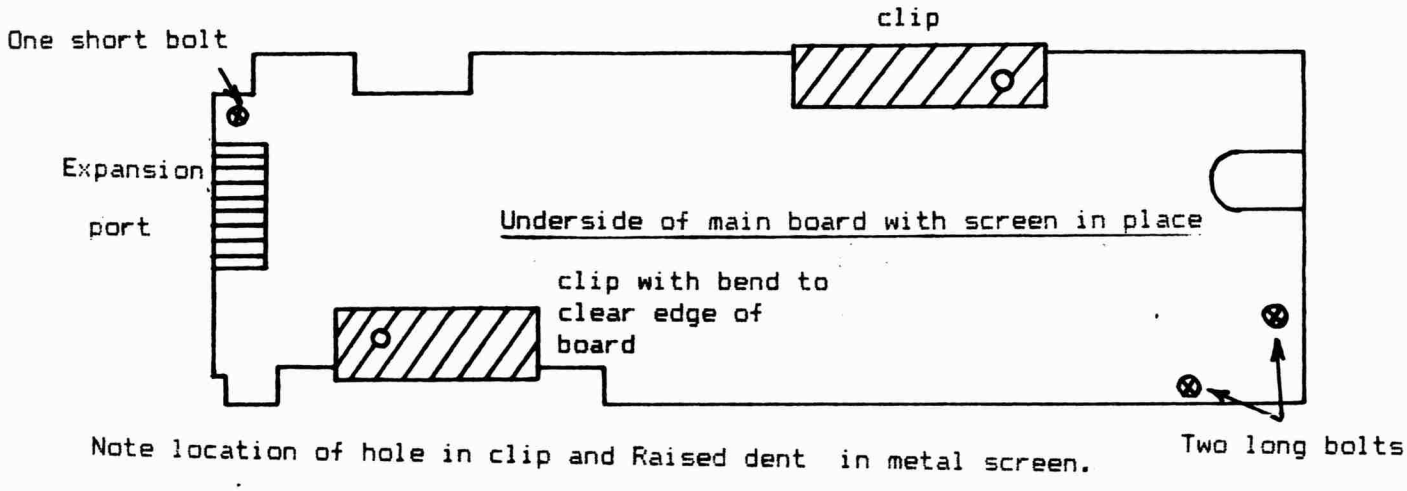


Figure 2. Main board after removal. To gain access to the printed circuit board the screens on both sides must be removed.



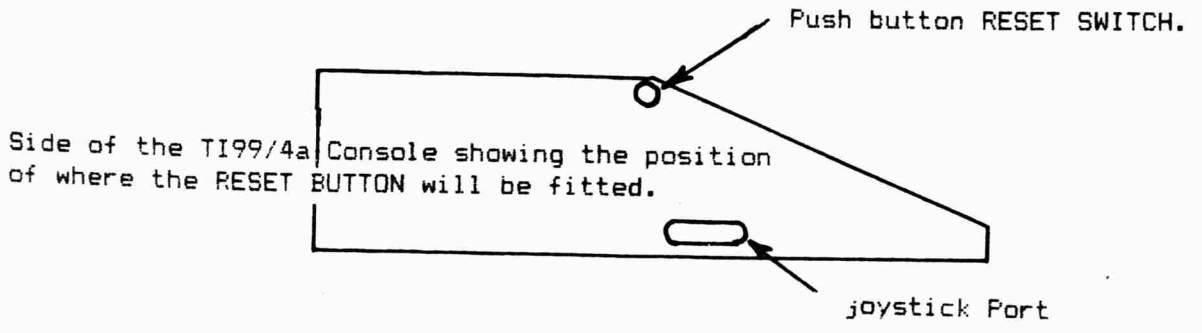


Figure 3. Main board with screens removed. The view is of the component side with only a few of the components illustrated.

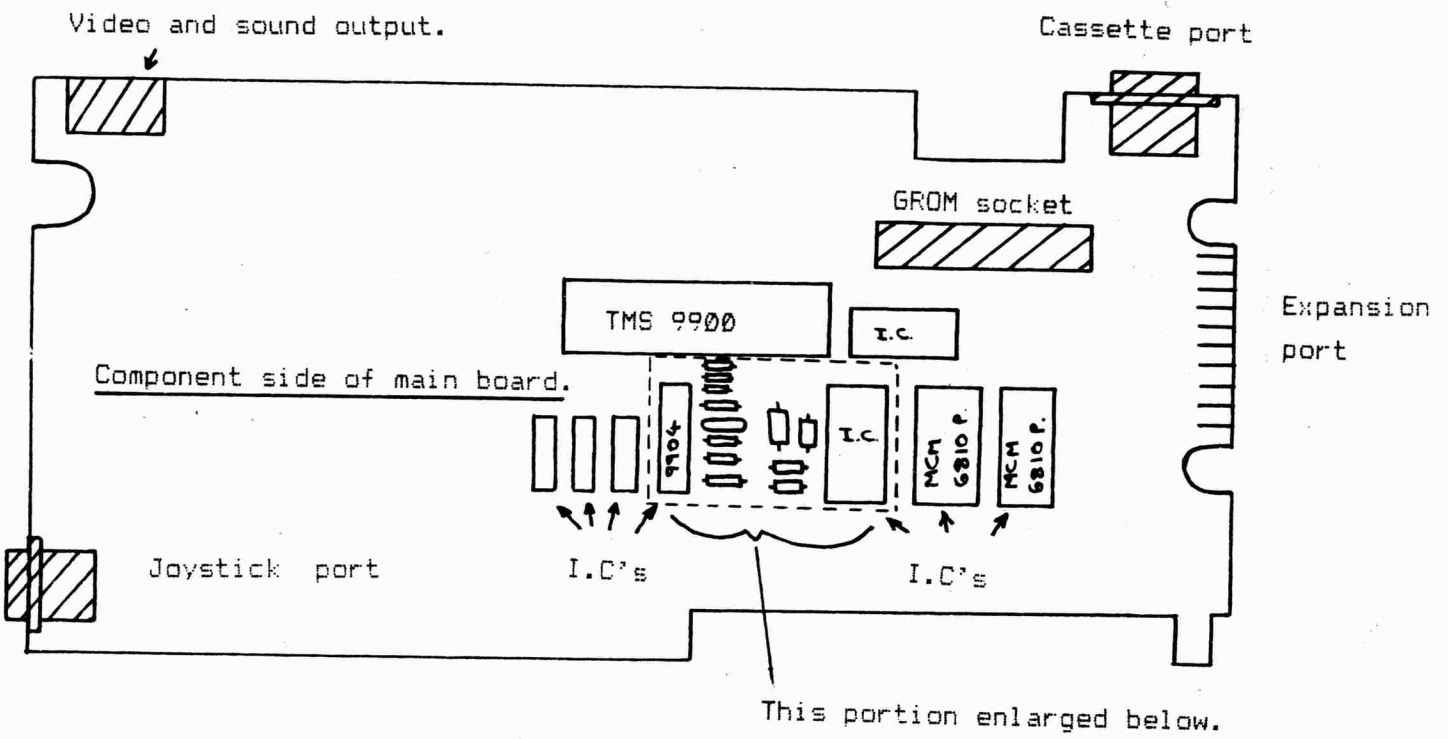


Figure 4 Enlarged view of components on the main board.

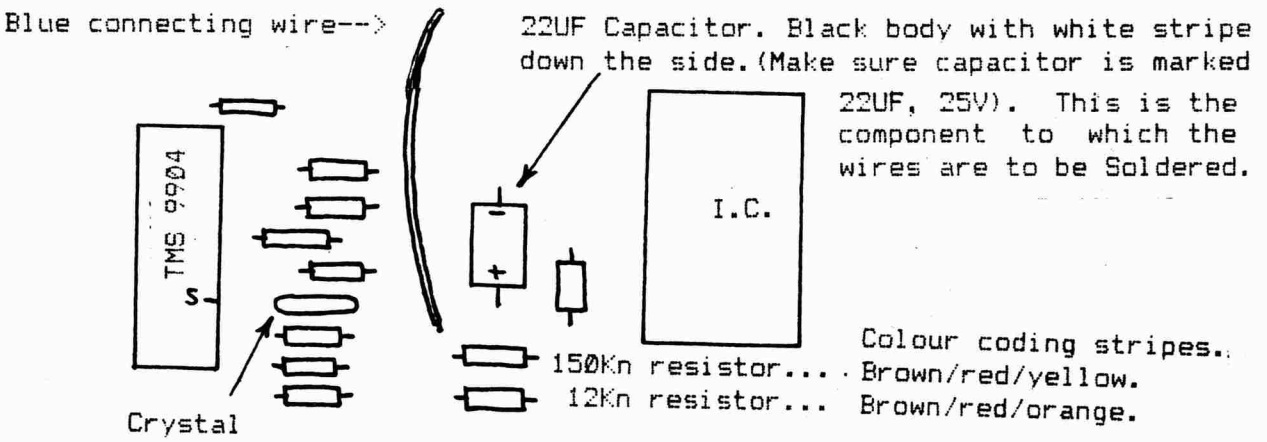
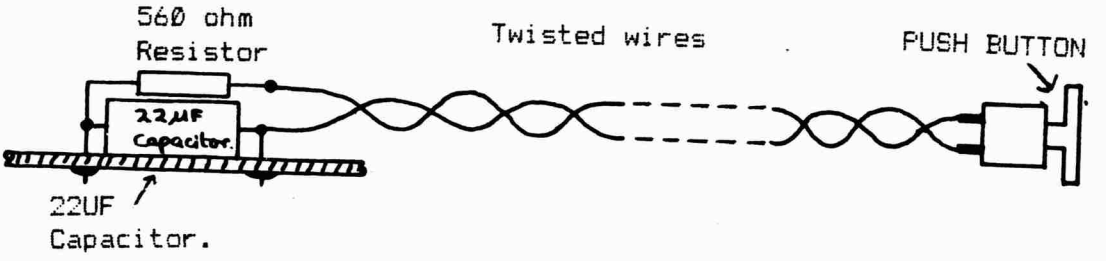


Figure 5 Side view of capacitor showing how resistor is mounted using sleeving to insulate the wires.



16 Find the 22 microfarad capacitor shown on figure 4. This is capacitor C606 and is the component across which the switch and resistor are to be fitted. The details of how to do this are shown by figure 5. Solder the 560 ohm resistor and the two wires as shown. Very important note. Only the minimum solder to be used to make a good connection. Also, do not allow the capacitor to become too warm. Do not bridge across any tracks on the pcb. This is a danger as the tracks are close together. Fit sleeving before soldering to prevent accidental short circuits. Ensure that there are no loose ends or whiskers of wire free to cause short circuits.

17 Drill hole in the upper half of the console case of sufficient size to take the push switch. I have mounted the switch as shown by figure 6, as this position does not foul any of the pcb's when they are refitted. Ensure that the contacts of the switch do not short circuit to the shield of the main board when it is refitted.

18 Pass the connecting wires through one of the ventilation holes of the shield that is to be fitted to the top surface (component side) of the main pcb. There are many holes available, but use the nearest to the connection so that the wires may be reasonably direct.

19 Twist the wires together, and solder the other end to the push switch.

20 Clean off the surface on top of the chip that has the white heat conducting silicon compound and also the heat contact on the metal shield. Smear these two surfaces with a fresh coating of heat conducting compound.

21 Refit the top and bottom screen. Ensure that the bottom screen is correctly fitted over the expansion port socket, and that this shield around the expansion port socket correctly engages with slots in the top shield.

22 Refit the nut/bolt/washer assemblies (3 off). Note that the short bolt is next to the expansion port socket, and also that the nuts fit on the upper (component side) screen. Do not overtighten these nuts as the shield is thin.

23 Refit the two clips. They are not interchangable as one has a bend in it which allows it to fit over the edge of the pcb. The two holes in this clip also fit over raised dimples in the shield.

24 Replace the GROM socket and small pcb assembly. This plugs into the socket on the main board through a slot in the shield. Note that the assembly can be fitted either way around, but only one way is correct !. The GROM port socket rests upon the metal bracket which forms part of the upper shield on the main board.

25 Offer up the main board to the upper part of the case. The GROM port socket assembly fits through a slot in the plastic case to rest behind the spring loaded door.

26 Reconnect keyboard to main board by re-inserting plug. This fits into the row of pins on the upper (component) side of the main board.

27 Locate the main board in place, positioning the twisted wire to the reset switch neatly between the top of the board and the plastic case. Make sure that the brown wires which are to be plugged into the power supply regulator board pass underneath the main board (as viewed from above), and around the support pillar. This is to allow them to tuck neatly away without fouling the regulator board. It may be necessary to slide the keyboard forward slightly to allow the long plug on the main board to clear the back end of the keyboard pcb. The main board should sit square and solidly in place, so that inserting the three self tapping screws do not flex the board in any way. Re-insert the three self tapping screws to hold the main board to the plastic case.

28 Re-insert the four self tapping screws holding the keyboard in place.

29 Re-locate the power supply regulator board, and insert the plug with the four brown wires into the socket on the board. Make sure that the plastic slider fits over the on-off slide switch and into the guide on the case.

30 Slide the power inlet socket into its place at the back of the case, and fit the two self tapping screws holding the power supply regulator pcb in position.

31 Re-fit the base of the console case with its seven self tapping screws.

32 Slide the plastic 'T'-piece into the on-off switch slot in the front of the case. It should click into position.

This completes the process, and it only remains to check the operation.
Connect up the console and switch on. When running a program or using a cartridge, pressing and releasing the reset button at any time will momentarily make the screen go blank and then return the computer to the master test card screen.
I should like to stress again that the operation is fairly involved, and if you have not dismantled electronic equipment before it is best left alone, or get a more experienced friend to help out.

V. Comley

Viv. Comley.

EXTENDED TUTOR 3

(C) by TONY MCGOVERN

EXTENDED TUTOR

by Tony McGovern. Newcastle TI99ers Sydney Australia.
Our next example will be a good start on a non-trivial utility program for printing out TI BASIC or XB listings on a 80 column printer in two side by side columns which preserve the normal screen listing format. If you just LIST "RS232.BA=...." then the computer sends it out in DISPLAY/VARIABLE 80 format and it is up to you to tell the printer how to handle it. Something approaching screen image format is only obtained (with extra paper consumption) with the printer margins set way in. 80-col printout beats none at all by miles but let's try to be fancier. If you don't have disk or printer then this lesson won't be of immediate use, but will still be a good example to work through as a programming exercise. We might as well do something useful.

First we figure out what needs to be done, and work out a set of procedures that can be CALLed as needed. The program will do only the minimum necessary to do the job properly. Bells and whistles can be added later. In one or two places we shall make provision for adding extras (bells and whistles have nothing on speech) by dummy subprograms which can be filled in later. For a good discussion of the use of such "stubs" see the excellent book by R. Mateosian, "Inside Basic Games". The detailed coding examples in this book are in Apple or Trash-80 Basics, but Mateosian develops ideas in a form much more in tune with a TI XB subprogram realisation than with these less capable Basics.

So let's start designing our program by deciding what we want it to do. We want the output nicely formatted on the page with top and bottom margins, in 2 columns each in screen image (28 char/line) format. More columns (assuming the output device will handle them) are no problem -- once you can count to 2 then 3 is easy. Lines of Basic are not to be split from from one column to the next or from one page to the next. Some things commonly encountered in printed listings, such as indenting of FOR-NEXT loops don't fit at all well with the multi-statement lines of XB (but might with TI Basic listings) so will not even be thought about here. On the other hand insertion of spaces before REM or SUB statements greatly improves the readability of XB listings, without doing violence to the idea of being screen list compatible. Page numbering is no big deal to add (a console only XB program can fill 6 pages).

At the other end of the business the LISTing to be printed is assumed taken from a disk file such as DSK1.LIST where it has been written by LIST "DSK1.LIST". A trivial difficulty easily taken care of is the blank first record written by LIST. The real problem is that LIST doesn't care about preserving XB lines as distinct entities. Each XB line starts out as a separate print record and if it is less than 80 characters long stays in one piece. XB lines can easily extend into 2 print records and more (Basic lines much less frequently), but LIST places no markers to show which print records contain the start of XB lines. So if we are going to meet our specification that XB lines be treated exactly as in a screen list then something more subtle than a simple LINPUT is needed. There's one of our most important building blocks identified --- SUB BASICLINE(...).

Any utility program needs title and advice screens so there's SUB TITLES to keep all the details from cluttering the main program. The program will also need SUB OPTIONS(...) to handle file and device name entry and print options which might be offered.

Now the real core of the program is the way in which it must assemble a whole page before printing anything because line feed moves ever on. So we need SUB PAGEBUFFER(....) to take the output of BASICLINES, chop it into screen format hunks and decide where these are to be located on the page. Then we need SUB PRINTPAGE(...) to massage the completed pages and ship them off to the printer. That about sums up the sub-programs that are called directly from the main program, and all that is necessary is to figure out the initialisation -- DIMs, default filenames etc etc, and to write the logic for program flow.

Before we start writing any code we should decide what utility sub-programs are to be used by those already defined. As the list is written into columns SUB WRITECOL(...) is a good candidate for repeated use, and SUB WRITEPAR(...) to take a line of BASIC and return it chopped up into 28 character lines to WRITECOL. Since BASICLINE fetches the input records it is the appropriate place to detect End Of File. We might as well use PRINTPAGE to wipe the slate clean before writing a new page.

Let's dress up the input of filenames and Yes/No responses a little as SUB FILENAME(...) and SUB YN(...) , with SUB MORE(...) to end it all. Other useful utility sub-programs which will be included are SUB TXTCOL(..) to change display colors in one CALL, SUB KEYCON to carry the burden of "press any key to continue", and SUB DELAY(..) is always handy.

That about finishes the roster of procedures necessary to make up the listing program, and now the detailed coding can start after some thought on the necessary chains of parameter passing. The principle that you should plan your programs from the top down and code them from the bottom up is just as valid in Extended Basic as it is in TI-LOGO or TI-FORTH where the form of the language makes it difficult to do otherwise. Sub-programs make it possible to go the same way in XB with ease. Less capable dialects of Basic make it a lot harder to keep your thoughts organised and your code on the rails.

The actual program will now be listed piece by piece and commented on in detail. The listing has been transferred into this TI-Writer file from a working copy of the program using a more elaborate version. The present program is actually a simplified version of the one originally written, but is powerful enough to do a useful job.

```
100 REM ** SIMPLIST **
110 REM * PRINTER LIST *
120 REM ** FROM DISK **
130 REM -FUNNELWEB FARM-
140 OPTION BASE 1 :: DIM PRLN$(66,2)
150 REM * DEFAULT VALUES *
160 CALL TITLES :: SFIL$="DSK1.LIST" :: PDEV$="RS232.BA= 4800"
170 CALL KEYCON
```

The first part of the main program shown here sets default values and DIMensions the string array PRLN$ for two columns of 66 lines each. The top and bottom few lines will be left blank so that page format is obtained without sending printer control codes. A 66 line/page, 80 col. printer is assumed.

```
180 REM * NEW FILE ENTRY *
190 CALL OPTIONS(SFIL$,PDEV$):: ENDFILE=0 :: LINPUT #1:N EW$
200 REM * NEW PAGE ENTRY *
210 CALL PAGEBUFFER(PRLN$(,),ENDFILE)
220 CALL PRINTPAGE(PRLN$(,),PDEV$):: IF ENDFILE=0 THEN 2 10
230 REM * END OR NEXT *
240  CLOSE #1 :: CLOSE #2 :: CALL MORE(NM):: IF NM THEN C ALL SPEAK("GOODBYE"):: GOTO 250
ELSE 190
250 STOP
```

OPTIONS returns file and device names as entered there, and the remainder of line 190 resets the End of File flag, and throws away the first line of the list-file. At new page entry the page buffer is filled and then printed out repeatedly until it runs out of listing, and then it asks if you are finished. That's all there is to the main program folks. And now to the sub-programs that do all the work.

```
260 SUB TITLES
270 CALL CLEAR :: CALL SCREEN(11):: DISPLAY AT(12,6)BEEP :"PRINTER LISTING"
280 SUBEND
290 SUB OPTIONS(S$,P$):: DISPLAY ERASE ALL :: CALL TXTCO L(16,5)
300 CALL FILENAME(1,2,"Edit as needed and ENTER","N?")
310 CALL FILENAME(4,4,"Source file for listing",S$)
320 CALL FILENAME(8,4,"Printer devicename",P$)
330 CALL YN(" Change mind ?","N",22,5,I):: IF NOT(I)THEN  CALL  HCHAR(22,1,32,64):: GOTO
300
340  DISPLAY  ERASE  ALL  ::  IF S$="" OR P$="" THEN DISPLAY AT(1,2)BEEP:"NO INPUT/OUTPUT
POSSIBLE" :: CALL DELAY(500 ):: GOTO 300
350 OPEN #1:S$,DISPLAY ,INPUT ,VARIABLE 80 :: OPEN #2:P$ ,DISPLAY ,OUTPUT,VARIABLE 80
360 SUBEND
```

TITLES here is little more than the barest stub, but you can fill that out to your own fancy. OPTIONS takes down the file names, does some checking, and opens the files.

```
370 SUB PAGEBUFFER(PRLN$(,),EFL)
380 REM * NEW COL ENTRY *
390 PLN=6 :: COL=COL+1 :: IF COL>2 THEN COL=0 :: SUBEXIT ELSE PRINT "":"** Reading column
#";COL:"":""
```

```
400 REM * NEW PARA INPUT *
410 IF EFL THEN PRINT "":" *":"*** END of  FILE  ***":"  *"  :""  ::  SUBEXIT  ELSE  CALL
BASICLINE(NEW$,EFL):: PRINT NEW $:""
420 CALL WRITECOL(PLN,COL,PRLN$(,),NEW$)
430 IF NEW$="END of COL" THEN 390 ELSE 410
440 SUBEND
```

The new column entry in PAGEBUFFER resets the line counter PLN to top of page with a margin, increments the column count, and exits back to the main program if the page is full. If not it tells BASICLINE to fetch a new program line and WRITECOL to enter it in the page buffer. If BASICLINE says it has read the last line it exits and lets the main program worry about that, otherwise it gets another Basic line or starts a new column. A stub here, CALL SKIPLINE(NEW$,SK), could have uses.

```
450 SUB BASICLINE(N$,E)
460 N$="" :: IF NX$="" THEN LINPUT #1:NX$
470 N$=N$&NX$ :: IF LEN(NX$)<80 OR EOF(1)THEN NX$="" :: E=EOF(1):: SUBEXIT ELSE LINPUT
#1:NX$
480 PX=POS(NX$," ",1):: IF PX<2 OR PX>6 THEN 470
490 P=POS(N$," ",1):: IF PX<P THEN 470
500 NR=-1 :: FOR I=1 TO PX-1 :: C=ASC(SEG$(NX$,I,1)):: N R=NR AND C>47 AND C<58 :: NEXT I
:: IF NOT(NR)THEN 470
510 IF SEG$(N$,LEN(N$),1)=" " THEN 470
520 IF VAL(SEG$(NX$,1,PX-1))<VAL(SEG$(N$,1,P-1))THEN 470 530 REM ** CHECK QUOTES 540
NQ,I=0
550  I=POS(N$,CHR$(34),I+1):: IF I THEN NQ=NQ+1 :: GOTO 5 50 ELSE IF NQ<>2*INT(NQ/2)THEN
470
560 SUBEND
```

The procedure BASICLINE which retrieves complete lines of Basic code from the LIST-file is the only part of the program with decision flow complex enough to warrant drawing out a flow diagram beforehand. I am not going to reproduce this here, but you can work out your own and see if it leads to similar code. The problem comes when the procedure has read in a line exactly 80 characters long. Does the next LIST record then represent a continuation of the same line of Basic or is it the start of a new Basic line ?
This difficulty can't be ignored if screen list format is to be preserved since 28 into 80 does not go exactly. The procedure provides a cascade of tests each of which checks whether the record being scrutinised should be appended as a continuation of the previous Basic line.
A few more rare cases could be tested for along the lines of 540-550. There is one (that I know of) unlikely case which BASICLINE cannot resolve even in principle. Can you spot it ? It does seem to work well already though. The intricate input code is needed since a VARIABLE file can only be read sequentially, and if the battery of tests says that the last record LINPUTted does start a new Basic line, then this must be saved till BASICLINE is called the next time.

Just be thankful for static variables in XB subprograms ! You also have to take care not to set off the End of File alarm prematurely.

```
570 SUB WRITECOL(P,C,P$(,),N$):: IF NC THEN P=6 :: NC=0
580 IF P>=57 THEN N$="END of COL" :: NC=-1 :: SUBEXIT
590 CALL WRITEPAR(P,C,P$(,),N$)
600 SUBEND
```

Now that WRITECOL has the line of Basic it sends it off to be formed into a paragraph. This simplified program handles coming to the end of a column in a slightly wasteful way that is very simple to program. A normal XB program line lists at most on 5 screen lines, and no matter how tricky you are in entering longer lines the program has already limited it to a string variable (max length 255 or 10 screen lines) or has crashed with an error.

The simple minded solution is to exit with End of Col message if the proposed starting line for the new paragraph is past a fixed place somewhat short of the end of the column. The value entered, line #57, is a compromise between making the program totally bulletproof or wasting space. A better approach is to print as far as possible, testing each new paragraph to see if it fits, and if not, holding it over for the next column. If you wondered why the string was called NEW$, then spare a thought for OLD$ which which vanished without trace during program simplification for tutorial purposes.

```
610 SUB WRITEPAR(P,C,P$(,),N$)
620 P=P+1 :: IF LEN(N$)>28 THEN P$(P,C)=SEG$(N$,1,28):: N$=SEG$(N$,29,LEN(N$)-28):: GOTO
620 ELSE P$(P,C)=N$ :: N$=""
630 SUBEND
```

Sub-program WRITEPAR almost was called SALAMI as it slices up NEW$ and assigns the slices to successive printlines. Once entered line 620 loops on itself recursively until the remaining piece fits on a screen line. It assumes range checking has been done before entry.

```
640 SUB PRINTPAGE(P$(,),D$):: PRINT "":"** Page print st arted"
650 PRINT "":"** Assembling printlines":" and printin g to" :: PRINT "":" ";D$
660 FOR I=1 TO 66 :: PRINT #2:TAB(9);P$(I,1);TAB(45);P$( I,2):: P$(I,1),P$(I,2)="" ::
NEXT I
670 SUBEND
```

Not much needs be said about PRINTPAGE beyond noting that line 660 formats a single print record from the two column entries and erases the page buffer as it goes.

```
680 SUB YN(A$,B$,R,C,X)
690 DISPLAY AT(R,C)BEEP:A$&" (Y/N) "&B$ :: ACCEPT AT(R,C
+LEN(A$)+7)VALIDATE("YN")SIZE(-1)BEEP:A$ :: X=A$=B$ :: R =R+2 :: SUBEND
700 SUB KEYCON :: DISPLAY AT(24,6)BEEP:"ANY KEY TO PROCE ED"
710 CALL KEY(3,I,ST):: IF ST=0 THEN 710 ELSE DISPLAY ERA SE ALL
720 SUBEND
730 SUB FILENAME(R,C,M$,D$)
740 DISPLAY AT(R+1,C):RPT$("-",LEN(M$)):: DISPLAY AT(R,C ):M$ :: IF D$<>"N?" THEN DISPLAY
AT(R+2,C):D$ ELSE SUBEX IT
750 ACCEPT AT(R+2,C)SIZE(-15)BEEP:D$ :: SUBEND
760 SUB MORE(NM):: DISPLAY ERASE ALL :: CALL TXTCOL(3,12 ):: CALL YN("More
listings","N",16,2,NM):: SUBEND
770 SUB DELAY(A):: FOR A=1 TO A :: NEXT A :: SUBEND
780 SUB TXTCOL(A,B):: CALL SCREEN(B):: FOR I=0 TO 12 :: CALL COLOR(I,A,B):: NEXT I ::
SUBEND
```

The FILENAME routine writes an underlined heading, DISPLAYs the default response, and ACCEPTs the reply. If it is asked no question, "N?", it expects no answer. The other SUBs just do their job when called. YN acts like input routines familiar in other TI modules.

```
790 SUB SPEAK(A$):: CALL PEEK(-28672,SP):: IF SP=96 TH EN THEN CALL SAY(A$) ELSE CALL
DELAY(5*LEN(A$))
800 SUBEND
```

This is a last little goodie tagged on so that you may add speech prompts to your program where desired. A bald CALL SAY has the annoying behaviour that it seems to take forever in giving up the attempt if no speech synthesizer is attached. Line 800 checks that speech is connected and line 820 substitutes a controlled delay if not. CALL SPEAK("....") can then be inserted anywhere it is wanted in the program.

So there we have it, a worked out example of a non-trivial and useful program that makes essential use of the sub-program facility of XB. It shows that the XB programmer can, with a style that finds natural expression in the language without undue contortions, follow the general principles of "structured programming" without getting hung up in the Swiss straight-jacket so beloved by some proponents.
The program as presented is a cut-down version of the all-singing, all-dancing model, COLIST, which has now grown to >22K and uses 48 subprograms. In all the versions, subprograms have been an essential tool for program development. Now it's time to take retrospective look at what at what we have done and chase a few more subtleties
[Co List, now replete with some machine code, is on sale from Stainless Software....ss]

>>>

TI WRITER TIPS

TI-WRITER AS A FILING SYSTEM

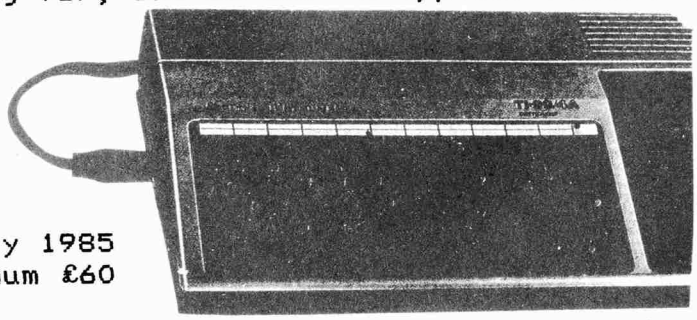
by Gregory Roscow

One of the gaps in the range of software TI produced for the 99/4A is a flexible filing system. Although the PRK and Statistics modules, by themselves and with the Report Generator, can be very useful for certain purposes, there are restrictions on the length and number of records per file, the number of items per record, and on the options for printed output. Arcade Hardware has advertised a database by Navarone which may overcome these limitations, but I have not yet seen what it does. Perhaps Howard Greenberg could be persuaded to write and tell us about it, as a follow-up to his helpful comments on Multiplan.

Sometimes, however, file management and database software can be too powerful. It can take a lot of time to set up, and once you have done so you are generally stuck with the original configuration. I think many people, unless they are in business, want something that is both less powerful than a database and more flexible than the TI data management modules.

Enter TI-Writer. Suppose you want to keep a file of your computer transactions: who has bought or sold what and when, what bits of hardware and software they're looking for, and so on. A typical record might look like this:

John Smith
10 Parsec Place
London
NW8 0PN
01-234 5678
Bought Tombstone City 28 January 1985
Looking for expansion box maximum £60



There are several advantages to using a word-processor to store such information. First, no special setting up is required. You simply type in what you want when you think of it. Secondly, you have convenient access to every piece of information in the record through the search facility offered by TI-Writer (or any other word-processor worthy of the name). You are not restricted to a set number of keys to get at the information. What is John Smith's address? Just go to the command line and type FS (FindString) and /John Smith/. Whatever happend to the Tombstone City module you thought you still had somewhere? Type /Tombstone City/ or simply /Tombstone/. Who was it that wanted an expansion box? etc. etc.

Used in this way a word-processor can be more useful for some filing purposes than true data management software. The one drawback is that you can't sort the records, but the search facility more than compensates for this in many cases and there is no need to bother with things like fields and keys. You can include as much or as little information of any kind and in any form that you choose, and it can easily be updated by insertion or deletion.

There is no need to define the format of the records. FindString does not care whether the information is stored in passages of purple prose or in terse single-line entries. To make the most of the search facility, however, you should try to keep the form of the entries as simple and natural as possible. It may be tempting to use the form SMITH John to head a record, but if you forget that you've used inversion and capitalisation you're in trouble. Capital letters and punctuation should only be used when absolutely necessary. FS /expansion box/ will not find either /Expansion Box/ or /"expansion box"/, and it's unlikely you'd remember these forms. Abbreviations like /exp. box/ are best avoided for the same reason.

Whatever form you choose, the important thing is to be consistent. Some words and names, however, have alternative spellings and it can be difficult to remember which you've used. Did you type Munch Man or Munchman? There is a rule to remember that gets round this difficulty: FindString looks for the first COMPLETE form of the word or phrase in its search. FS /Munchman/ will therefore NOT find /Munch Man/, whereas FS /Munch Man/ will find /Munchman/ and FS /Munch/ will find both. Incidentally, you don't have to use slashes with FindString, which can save a little time if you're doing a lot of searching. If they're omitted, however, only the first word in a string will be located. FS John Smith will find this name only if there isn't another John earlier in the file. With strings of two or more words it's safer to use the slashes.

The most important thing to remember when accessing information with FindString is that for each new string the cursor must be positioned AT THE BEGINNING OF THE FILE. If it isn't, the search will take place only from the point in the file where you happen to be. To find all occurrences of /Smith/, home the cursor with CTRL L and roll up with FCTN 6, then keep using FS /Smith/ until you come to the end of the file.

It's a pity TI-Writer hasn't a single keystroke for this operation, but at least there is a way of getting to the end without using the roll down key combination. Simply use FindString with a nonsense string like /xyz/, or make the last line of the file a Comment such as EOF (End Of File) and use FS /EOF/. This is particularly useful when you first load the file and want to add more records. A final comment line could also include the date, which could be altered each time the file is revised. Comment lines can be used as markers at other points to help you find your way about quickly in a long file.

While the sorting facilities of a database are not possible with TI-Writer, there is a simple method of accessing records alphabetically which can be useful for printing purposes. Choose a key for the file such as surname and a character to identify it, e.g. John _Smith. Don't use any of the characters that have a special function in TI-Writer, such as the slash (FindString) and the full stop (format commands), or that you might want to Transliterate later to send formatting instructions to your printer. The purpose of this character is to limit the search to the key words; otherwise ALL capital letters would be found. To print out the records in alphabetical order, position the cursor at the beginning of the file and work through the alphabet with FS /_A/, /B_/, /_C/, etc. Each time a record is found you can use the relevant line numbers with PrintFile to print it (see *TI-Writer User's Manual*, p. 76, 'Printing Part of the Text Buffer'). You'll have to go back to the beginning for each new letter, and the list will be alphabetical only with regard to the first letter of the name, but the procedure can be useful and in practice it is not quite as fiddly as it sounds. The screen scrolls up quite quickly if you keep the FCTN 6 keys held down.

Other characters could be used in this way to create as many keys for sorting purposes as you need, though this might begin to defeat the object of keeping the system as simple as possible. With Text Editor the characters will of course appear on the printout, but you can get rid of them in Text Formatter by using the Transliterate command to turn each one into a space.

A simple and flexible filing system of this kind has considerable potential. Imagine a recipe file where all you have to do is look in the fridge and see what you've got, then type in the ingredients and try to come up with a meal! I have a monster file called THINGS that I dump everything into as I think of it and gradually sort out when

certain records start to need a separate file. Where is the database that you can throw anything into in any form? THINGS is particularly useful for bits and pieces of information that are hard to classify or don't warrant a file of their own.

TI-Writer offers several commands to help with file management. Records can be re-positioned with the Move command. Material from other files can be incorporated at any point using INclude file. Selected records can be printed using PrintFile and line numbers in Text Editor, or a separate file with special instructions can be created for use with Text Formatter. Changing a piece of information throughout the entire file is a simple matter with the ReplaceString option. In short, TI-Writer offers considerable scope for tailoring a system to meet your particular needs.

Using a word-processor in this way can help you to decide if you need more powerful file management software. If certain files acquire a lot of records in a standard format it is probably worth moving them to a database. I also have a Commodore SX-64 and use the standard word-processor Easyscript to collect information, some of which is then transferred to a powerful filing system called Superbase which has all the necessary sorting facilities. But with a manual of more than 200 pages, Superbase is hardly worth setting up just to remind me of what's in the loft, what birthday and Christmas presents to buy, where to find cheap printer paper, or what that bright idea was I had for solving unemployment! Fortunately, Superbase and Easyscript are compatible, so if files are to be transferred they needn't be completely retyped. It would be helpful if the Navarone Database were similarly compatible with TI-Writer.

One last TIp. If like me you tend to read manuals only when you get into serious difficulty, you may have missed the point that it's possible to turn off the 80-column screen. Windowing can be a nuisance when you're dealing purely with text rather than with columns of numbers. Use the Tabs command to set the right margin to 33 (with line numbers) or 39 (without line numbers) and all printing will then be visible on the screen. These tabs will be saved with the file and can be reset for printing with Text Editor.

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£1,500 fines for 'piracy'

FINES totalling £1,500 were imposed on a Wigan computer firm and two directors under the Trade Descriptions Act for selling counterfeit tapes.

The company claimed at Wigan it did not know the goods were forgeries of products distributed by a Stockport man.

Lynkirk Limited — who trade as Blue Chip Computers from Library Street, Wigan and premises in Goose Green and St Helens — had denied five offences of applying false trade descriptions to computer program tapes and five others of supplying tapes indicating they had been produced by Stainless Software of Stockport.

Managing director Alan Brady, aged 34, of Barwell Avenue, Island Brow, St Helens, and his brother Michael, aged 33, of Syston Avenue, St Helens, had each denied 10 allegations involving "pirated" tapes.

The magistrate heard that the brothers bought two separate consignments of goods from the proprietor of Stainless Software, Steven Shaw in 1983. In February last year Mr Shaw complained that Lynkirk were marketing counterfeit copies of his computer products.

Mr Graham Jackson, prosecuting, said the two men copied tapes before supplying them to firms indicating they were produced by Mr Shaw's company or with his consent.

Lynkirk, who said they would appeal, were ordered to forfeit 37 tapes.

Manchester Evening News 25/5/85

PIRATES' DAYS ARE NUMBERED...

Legislation on copyright protection for software moved a stage closer on Friday (10th May 1985) when the house of Lords gave an unopposed second reading to the copyright (computer software) amendment bill.

!!

2022 update: The brothers won their appeal -in the absence of computer software being copyright in the UK at that time, and the prosecuting authority had been closed down by the Government. There was also a clueless barrister from London...

A PRINTER INTERFACE FOR THE TI99

by DAVE HEWITT

One of the uses that any computer , including the TI-99, can be put to is word processing , letter writing, etc, but this creates the need for a printer connection. This facility is sadly lacking .from the TI-99.

The usual means of connecting a printer to the TI-99 is to purchase the Peripheral Expansion System and the RS232 card to go in it. This approach is very bulky and costs more than many people are willing to pay.

The second option is to re-define the function of the joystick port as an RS232 output, but this requires Mini Memory or Editor/Assembler and a machine code program to operate. Even then, it is only possible to print data from within a program, but it is not possible to list a program to the printer.

The third way to achieve a printer connection is to use a stand alone interface which plugs into the expansion port on the side of the TI-99. Until recently there was only a standalone RS232 interface available, but nothing to interface to a parallel Centronics-compatible printer. It seems logical to want to use a parallel connection since most printers have this as standard. Indeed, the RS232 connection is an option on many printers for which you have to pay extra.

Next question. Where do I get a parallel printer interface from? The answer is simple. I have just designed and built such a unit.

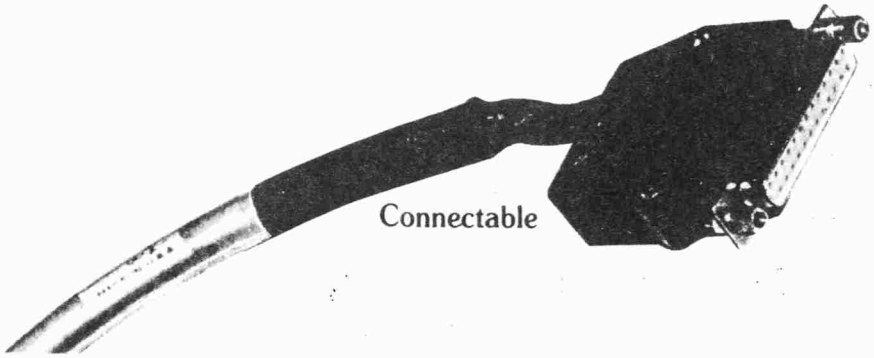
My interface is housed in a case approximately 110 × 60 × 30 mm in size that plugs directly into the expansion port of the computer. 1t is similar to a half-width Speech Synthesizer in that it stands vertically (being the same height as the console) and adding only 30 mm to the overall width of the system. Connection of the printer is using the standard BBC type of connector to enable readily-available BBC printer leads to be, used. This simplifies interfacing to almost any parallel printer.

In use the interface will allow any data to be printed to paper by the use of normal TI-99 file handling routines during program execution. It should be possible to adapt any program that uses a printer output to work with this interface simply by changing the OPEN statement to suit the interface name. In addition it is possible to list an entire program or selected line numbers to paper for documentation or to aid program debugging, etc.

It is now my intention to reproduce this interface for the benefit of any member of the group. The price will be between £50 and £60 depending upon the quantity involved, which will significantly influence the cost of the printed circuit board manufacture.

If anybody is interested in a copy of this interface then please contact me at the address below for more details.

D.G. Hewitt
31 London Road
Headington
Oxford OX3 9EJ



Cassette Files by Jane Laflamme

Now, here is a rock-bottom demostration on those 'darn' files:

Type in the following program, and save to cassette. Do not "RUN" it yet.

```
100 REM ****************
110 REM *CASSETTE FILES*
120 REM ****************
130 A$="CASSETTE FILE"
140 B$="WRITING DEMO #"
150 C=1
160 OPEN #1:"CS1",INTERNAL,OUTPUT,FIXED
170 PRINT #1:A$,B$,C
180 CLOSE #1
190 END
```

Lines 100 to 120, self-explanatory.
Lines 130 to 150, establish a variable in memory that we can save in a file.
Lines 160, tell the computer to open a file called #1 (This can be any number - from 1 to 255. "0" is the screen - try it sometime) and where to save it - CS1. We also want Tex to save it in internal format. Only Tex can "read" internal format, but who cares, we don't need to, yet. And finally we would like the computer to "OUTPUT" it from memory. You can only use FIXED format with cassette files. There is a number that can come after this but you can explore that later in the Users manual.
Line 170, we have told the computer to open the file, now we want it to write it on the tape. This line does that.
Line 180, that is all we want to write out so now we tell the computer we're finished, close the link with file #1.
Line 190 optional.

Change the tape in your recorder. Its good practice to have one tape for your program and another for your files. RUN the program and follow the prompts. Sounds a little different doesn't it?

So now we have some information only Tex can read on tape. Great! But what the heck do we do with it. READ it of course. But how? We need another program.... Type in the following and save to your program tape:

```
100 REM ****************
110 REM *CASSETTE FILES*
120 REM *READ THE FILE *
130 REM ****************
140 OPEN #255:"CS1",INTERNAL,INPUT, FIXED
150 INPUT #255:X$,Y$,Z
160 PRINT X$:Y$:Z
170 CLOSE #255
180 END
```

Lines 100 to 130, self-explanatory.
Line 140, notice that I have changed the file number. Tex doesn't remember that it was #1 the last time, nor does he care. Internal format because only he is reading it at the moment, and input because we want him to put it in to the console memory. Fixed, same reason as before.
Line 150, ah, the variable names are changed..same reason as above, he doesn't remember or care, just as long as they have the same attributes as they were written. X,Y$,Z$ would not work as you wrote two string variables and then a numeric variable.
Line 160, so Tex now has it in memory but we need to read it; put it on the screen! This line does that. Of course, you could use different print separators. Try a ";", or "," inbetween the variables.
170 to 180, shut down, we're finished.

Change from your program tape to the file tape and RUN the program. Voila! There's your information.

Play around with these two programs and experiment. You could combine them. Delete line 190 in the first program, renumber the second program starting with 190, and add the following lines:

```
70 INPUT "WRITE THE FILE? Y/N":L$
80 IF L$="N" THEN 190
90 IF L$<"Y" THEN 70
```

Now if you feel adventurous, try your own programs. INPUT your own variables; put them into a FOR/NEXT loop, or an infinite loop that you can only get out of by inputing "END". If you do this, before you close, print END (or whatever you choose) to the file so the computer will know the end of the file when it is reading it. E.G.:

```
INPUT A$,B$,C
PRINT #1:A$,B$,C
IF A$="END" THEN (close file line)
GOTO (Input line)
CLOSE #1
```

Don't forget to verify this in your read program. E.G.:

```
INPUT #255:X$,Y$,Z
IF X$="END" THEN (goto close line)
PRINT X$,Y$,Z
GOTO (input line)
CLOSE #255
```

Have fun filing...

Jane Laflamme

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ISSUES ONE TO SIX

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Personal Record Keeping and
TI WRITER modules,

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****

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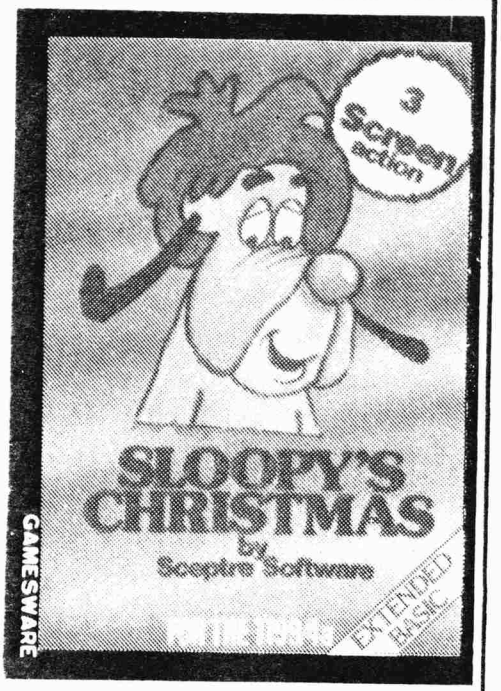

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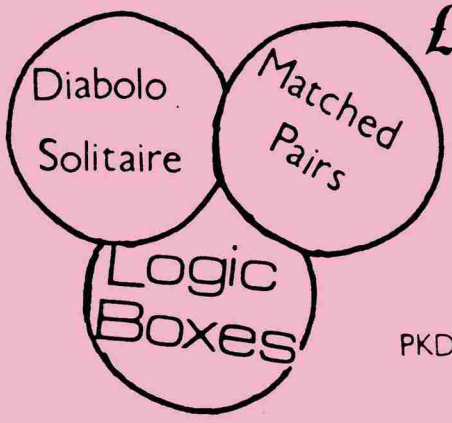

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