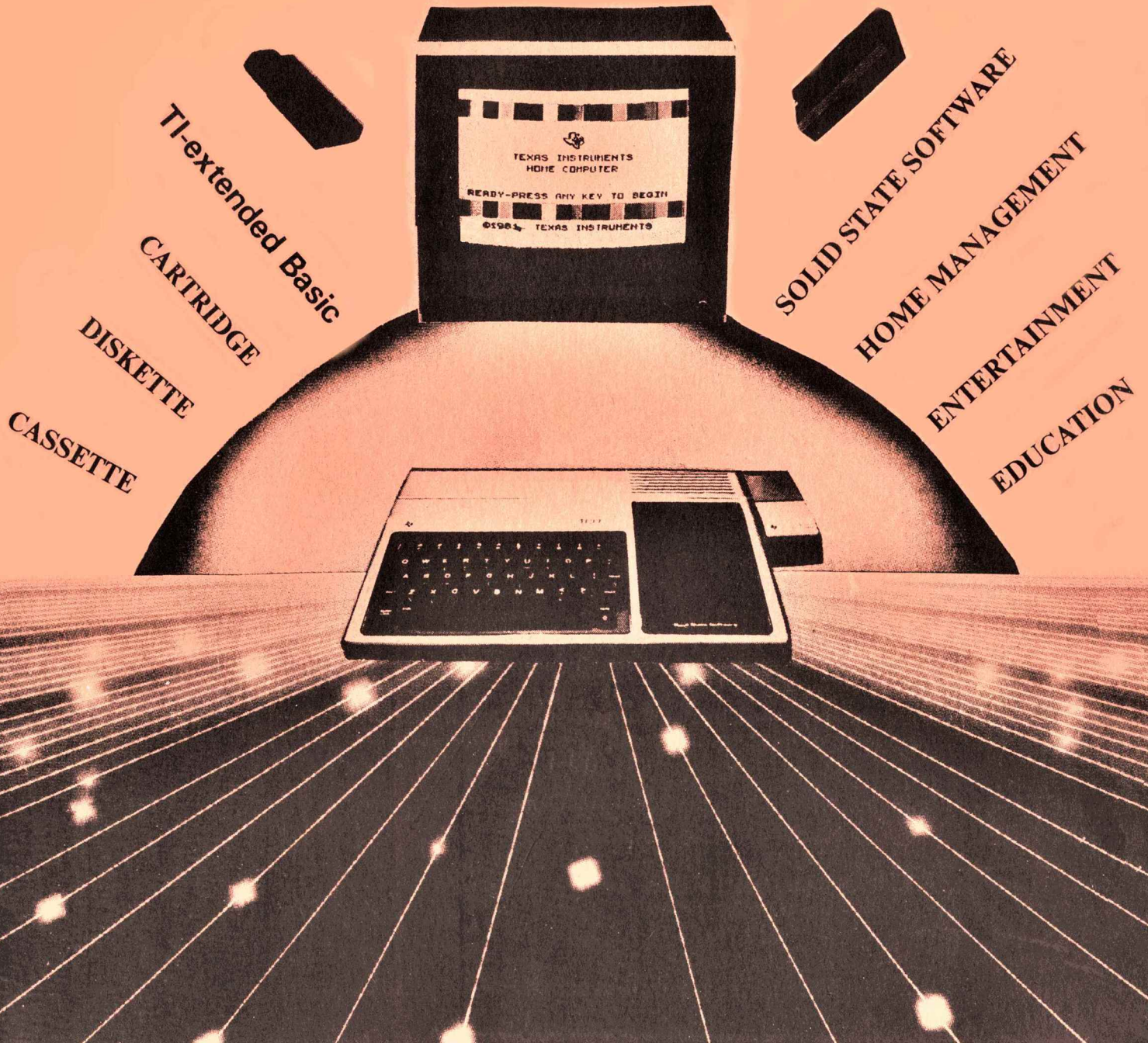


SUMMER 1984

NUMBER 5.

TI*MES

A quarterly publication
for
The TI-99/4A Home Computer



TI-extended Basic

SOLID STATE SOFTWARE

CARTRIDGE

HOME MANAGEMENT

DISKETTE

ENTERTAINMENT

CASSETTE

EDUCATION

TI99/4a EXCHANGE

TI-99/4A



of UK

WE WELCOME THE MANY NEW MEMBERS TO
TI99/4a EXCHANGE

TI*MES TI*MES TI*MES TI*MES TI*MESTI*MES TI*MES TI*MES TI*MES TI*MES
SUMMER 1984 NUMBER FIVE

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

**BRITAINS ONLY U.K. TI USERS
THAT OFFERS YOU MORE**



The telephone hotline was closed for two weeks in June due to annual holidays. Apologies to those unable to contact us then. This is a good excuse to ask if any of you would like to offer your services as an area contact. In the next edition of TI*MES your name will be published as representative to help others with queries on the TI99/4a or just a general chat.

We are pleased to enclose membership cards with this newsletter. Those people receiving renewal reminders will be sent theirs with the Autumn newsletter. NOTE These cards do not work in bank cash dispensers. Keep your card safe as it will give you preferential treatment in the Autumn. We hope to have exciting news about a NATIONAL MEETING of TI users in October. Watch computer press for details.

If any of you still have doubts about future software for your TI then we have some reassurances for you. There are now more exciting cartridges coming from the States, both from remaining TI stocks and from new 3rd party sources. Some excellent Thorn EMI modules may shortly be produced here in the UK under licence. All have a high standard of graphics and playability. Extended basic and Mini memory should now be easy to obtain. Although the price may seem high they are in fact cheaper than the price 2 years ago. There are new expansion systems and revolutionary voice recognition units. Cassette and disk based games and utilities from the States are usually of a high standard and will keep on coming so long as the TI owner/users keep on buying!

Those of you that are recent members of the group may have just purchased the TI99/4a and may not know how much power is under your fingertips. Whilst TI*MES started off to make the TI99/4a simple to use much pressure has come from members to move onto more technical editorial. Who can blame those wanting to stretch the TI to its limit. TI*MES are a changing especially as the months pass on. This group will continue to support the beginners but also provide features for those who want more from the console.

We are happy to advise that your very own TI99/4a Library has some really excellent software on offer. The advantage you have as a member is that you have access to the library which contains programs that are exclusive to TI99/4a Exchange members.

A special big thank you to those who submitted news and views to exchange with you. These contributions go towards making your own TI*MES a very readable newsletter.

CLIVE SCALLY

TI99/4a Exchange TI*MES newsletter is supported only by its subscribers. This TI users Group is completely non profit making. TI*MES is published quarterly, JANUARY, APRIL, JULY, and OCTOBER months. 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 which should be typed or be on disk or tape. Unaccepted material will only be returned if accompanied by a S.A.E. The editors reserve the right to refuse advertising.

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***** YOUR LETTERS *****

MR TUDOR-WILLIAMS of Gosmore, Hitchin writes:-

Many thanks for the copy of TI*MES with which I am most pleased. I do hope that your enterprise will flourish amongst TI owners and users, many of whom are in no doubt reeling from the defection of Texas - particularly after all the bally-hoo of the launching of their new "independent" users journal. I fear nevertheless that too many people will try to follow in your footsteps, diluting the support just when you will most be needing it. This will be a pity, as we must have all the support we can get if we are to keep this excellent piece of appartatus viable for any length of time.

ED:- Thank you for the kind remarks, a little praise goes a long way. As most of you will have seen the newsletter has increased in size alongside our membership numbers. We will maintain these standards as long as we have your support.

MUKUND RAJPARA of Moseley, Birmingham writes:-

Just come across a brilliant printer which plugs direct into the TI 99. Using a suitable interface cable available you can start printing. It is called ALPHACOM 42 - cost £99. The dealers are Dean Electronics Ltd, Glendale Park, Fernbank Road, Ascot, Tel.no. 0344 885661.

ED:- We contacted this firm immediately but were informed that although the printer was available they had no TI interfaces, and did not foresee getting any. Howard Greenberg of Arcade Hardware told us that the printers that he markets have all the necessary interfaces required for the TI. You also have the benefit of his personal service and advice, which counts for a lot these days.

JOHN PEARCE of Barrow-in-Furness writes:-

I work as a telephonist with the local Electricity Board. Over the past 6 months a number of admin. tasks have been speeded up with the employment of computers. A ICL DRS20 terminal has been installed. I am learning the delights of CP/N and the ease of use with disk drives...

ED:- John has recently had one of his programs accepted for marketing by a Softwarehouse. He has also contributed an excellent program "Sound effects" to our user library. Good to see that our micro has helped with the approach to one of the Professional machines.

WILLIE SMITH of Midlothian writes:-

Howard Greenberg in TI*MES number 4 quoted an extract from a letter of mine which had been published in HCW enthusing about our TI99/4a.... We actually became so enthusiastic about it that we even bought another colour telly specifically to couple up to the micro. While ostensibly the computer was purchased as a gift for my two children aged 11 and 9, all the family now make use of it.... I have no doubt that all those subscribing to TI*MES are real enthusiasts of the TI99/4a and need no prompting to voice their appreciation of the micro. I hope however that we shall continue to support the distribution of both hardware and software as best we can. With a bit of luck the coming birthdays in my family might produce, if there any left in stock, Parsec, speech synthesiser and most important Extended basic. I hope that the regular and technically more competent contributors to TI*MES will continue with their good work for some time to come.

ED:- We were sorry not to be able to print more of this long letter but I think the message is clear! All of your 'present list' is available still at Parco. We recommend you add 'Buck Rogers' to your list. It's a knockout.

MR. JOHNSON of London writes:-

I receive two other newsletters from two TI99/4a Clubs. I thought that your members may like to know how their "newsletters" compare to TI*MES.

TI-HOME Maidenhead, (a PR company that took over from Paul Dicks.) The last issue sent in April was the Winter edition. Still no Spring issue and we are now into Summer? TIHOME printed a 16 page newsletter of which 4 pages were adverts no features and mostly letters. Is this why TI owners loose interest?

TI-USER GALAXY VIDEO SHOP, Maidstone. Just received the May 84 issue (published quarterly). I paid six quid and all I get is 14 pages of photocopy with some statements as published in TI*MES months ago.....

There is no doubt which subs I will renew

ED: Thankyou for your remarks, it really depends who sends in material that makes any newsletter. Of course if one has to return a profit then the size of the newsletters will be the main criterion. TI*MES is non profit making of course.

CURSOR

by Dot Matrix.

IS THIS TI INVADER MERELY INTRUSIVE OR DOWNRIGHT USEFUL ?

It WAS what an estate agent might describe as a 4th bedroom/dining room/study/hobby room. I say was because it has now become occupied by a member of the high tech. revolution. Yes are the first people in our road to have a "Computer Room" Mr and Mrs Jones - eat your heart out.

How did it all begin? I'll take you back a mere two years (why does it seem longer?)

We are a gadget mad family - fully automated, radio controlled, fast forward, remote rewind, silicon chip, MAD. Whatever the new scientific age produces for the common man we want to play with it.

Thus it was when the home computer fell rapidly in price from £1000s to a couple of £100 that a shiny silver Texas Instruments TI99/4a arrived. It wasn't alone for long. Within weeks it had its own telly and then its own room. How marvellous it was all going to be. It could plan my week's meals for me (my biggest headache), educate the children and give endless hours of fun with exciting arcade games.

I had always been a sucker for video games machines. I would watch in admiration as some freckled nosed child zapped aliens to kingdom come for 10 minutes and then see my laser canons and my 10p disappear in 30 seconds flat. I knew I could never reach such standards without becoming poor. (is there an 'Impoverished Housewives Arcade Anonymous') Now here was my chance. No slots for money, this was all for free. Slot in the invader module, plug in the joystick and zap away. Sadly I have to tell you that I will never enter the Hall of Fame. There was many a slip twixt eye and hand and without ever reaching screen 3 I decided to get the computer to run the house instead.

As all frustrated TI owners know Robert Carrier, along with numerous others, was never recruited by TI to give us the benefit of his culinary knowledge. So if there wasn't any software around to help me then I just had to write some myself. I had to learn to program. Just read through the manual and type it in. So while I was trying to plough through the manual to teach the computer household management noone was managing the house. Labour saving devices lay idle and gathering dust as did everything else.

Enough-I came to the conclusion that it must be easier to look up a recipe than to cook up a program. Anyway getting Bechemal sauce out of the keyboard could be a problem. So I left the computer to the menfolk. Is this the reason why it is so male dominated?

Meanwhile the computer was expanding. It kept getting presents - a speech synthesizer, modules, tapes, then a peripheral box with its pack of cards and disc drives.

Right, says my husband, now we have the complete system it has to work for us to pay for its keep. So it helps with our cottage industry keeping records, mailing lists and does word processing. And work for us it does although at times it may seem we work for it.

Dot.

P.S. Does anyone have a program to plan my weeks menu?

CONGRATULATIONS !

John Mc Cauley's mum scored 2,441,700 at Parsec taking 3 hours to do so. Well done Maureen.

SITUATION VACANT.

ARCADE PAGE - the feature for under 18s urgently needs someone to write items of interest, programs etc for the younger users. Please write in if you can help.

We bring you all the
NEWS and more for
your TI99/4

LOS ANGELES 1984 AND
THE OLYMPICS

It is most timely in
this Olympic year that we
begin a close association
with the Los Angeles
99ers User Group. Anyone
visiting L.A. is invited
to pay them a visit
(213)271-6930. We send
them a copy of our
newsletters and in return
we receive theirs.

It is interesting to contrast the two groups. They have a large membership within a reasonable area and hold monthly meetings, work shops and live demonstrations.

I recently met with the President, no not Ronnie R. but TERRI MASTERS of LA99ers who made a visit to Sutton here in U.K. I had the pleasure of lunching with her and we talked and exchanged news and views regarding the TI99/4a.

The LA99ers group are very keen to ensure that all TI users do not suffer as a result of the Texas shutdown on the TI99/4a. Terri has very generously offered to help anyone anxious to obtain hardware software and will export direct.

It has been suggested that if anyone interested in wishing to adopt an "LAer" should write to us giving details of interests etc. A number of L.A.99ers have come forward wishing to correspond with someone in the U.K. I understand that several teachers are happy to get in touch with you. Also one member with a Bulletin board. So how about it. This is a marvelous opportunity that may open new frontiers for you. We will be pleased to forward details sent. The address of la 99er is P.O.Box 3547, Gardena, CA 90247-7247.

We received a letter from RAY KAZMER, KAZCO PO BOX 44023 SYLMAR, CALIF.91342 USA. who writes about the problem of PIRACY. He gives this as the main reason for lack of good USA software here in UK. Piracy (see Stephen Shaw article) is killing U.S. software house interests in "selling British". Ray has been very generous in submitting two extended basic programs for your software library. They are very good, high quality programs. Ray also submit EXT Basic or Assembly programs. Attention all members who asked us to send subscriptions to i.u.g (Enthusiast 99). These have all been sent to the group and the magazines will be sent direct to you. No more subscriptions are being forwarded by us but you can of course write direct to I.U.G. P.O.Box 67, Bethany, OK 73008.

REVIEW. NEW FROM THE STATES.

SIMONS SAUCER - a software package from Emerald Valley (TI BASIC) £9.75. If you have never encountered the third kind perhaps a close look at this 'Flipper-snapper' pack would be an alternative. Simon's saucer lands in the back garden and you use your computer to communicate with it, repeating the sequences of colours/sounds for colourful rewards. The cassette is boxed with flip cards to help you understand programming by changing the saucer program.

This program uses the TI's colour graphics and sound very well and together with the easy to follow lesson gives full value for money for the unexpanded machine.

Available from Christine Computing and other TI dealers here in the U.K.



TI * M E S E X C L U S I V E

SCENE USA



HOWARD WRITES AGAIN.

This is TI*MES first birthday edition. I'd like to startle you all by writing something staggering, meaningful and relevant. Well, you'll have to wait until at least the second birthday for that. Maybe longer. Still, my congratulations to our editors, who have made an amateur publication far better than that glossy professional drivel.

I've been fooling round with an Apple Macintosh and I have to confess I'm nearly as impressed with it as I was with the Lisa. Is any of this relevant you may ask? Well only in one way. Due to a shortage of space, I couldn't write my comments on the Microsoft Multiplan that I'd recently acquired before publication of the last edition of TI*MES. Being an imbecile, I promptly deleted the whole thing from the disc instead of using it in this edition. As a result, I can't remember half of what I wrote about. But I do remember that one of my main complaints about Multiplan, was that it was not particularly freindly. The concept of the electronic spreadsheet is no longer new, but whereas with word processing, you start off with some idea of where you're up to, a spreadsheet can be a completely new venture. I'd certainly never used one before. (There are times when I'm tempted to never use one again!), so it took a little getting used to. The most hideous part of Texas Instruments's version is the waiting. Unless the re-calc option is turned off before you make any entries in Multi-Plan, you have this wonderful sense of excitement similar to the kind you feel when watching paint dry, whilst you're waiting for the thing to recalculate every cell on the ***** thing. Texas Instruments's Multi-Plan is slow, make no mistake. The easiest way to do anything once the spreadsheet is set up is to turn off the recalc and then do your entering. Because computers don't think, and even if they did, they'd think differently to us, it takes Multi-Plan as long to calculate a series of empty cells as it does to work on a full set. We all know that \emptyset times $\emptyset = \emptyset$, but a machine doesn't. I can't pretend I like Texas Instruments's Multi-Plan, but it is useful.

Texas Instruments proved that they could make professional type software fit into the limited configurations that the TI99/4A offer with the excellent TI-Writer, so it puzzled me that they should revert to type by making Multi-Plan in the old fashioned way. But Texas Instruments didn't make Multi-Plan, Microsoft did and the reason they made it the way they did is now obvious. As I mentioned, I've been fooling round with a Macintosh. The first package I tried on the Mac was a Multi-Plan and it was instantly familiar. Having done this with two machines, I believe that were I to use any other computers Multi-Plan, that too would be useable immediately. The other benefits of using the Mac are speed and clarity of picture. But I'm not writing about the Mac, I'm still in love with my TI99.

For the first time since I started writing this column, I'm almost stumped for something to say. There is a lot that's new, most of it in the form of games, but you can read about them elsewhere. I also now have an MBX, which is a remarkble piece of machinery. I can be criticised for writing about/reveiwing products I sell, bu' in this case I don't know of anyone else who can write about it.

What you get for your money. The MBX comes in a polystyrene carton containing the MBX console, a headset which is two earpads and a throat microphone and a joystick. It's no ordinary joystick this. It may not

have the precision feel that the unit I make has, but it has a great many more planes of operation. There is the knob, which as well as moving in an analogue manner also rotates to act as a paddle. The fire button is now a trigger and in addition, there are three buttons on the back of the unit to give control features without having to reach for either console.

Setting up. This took some time. Not least because it's designed for 120 volts so I had to find an external transformer in addition to the enclosed mains adaptor. Don't be tempted to use a cassette type mains adaptor. The MBX draws 1 amp and that's 5 times the output of most mains adaptors. In short, it would melt in very short order. (All MBX's I supply will have a suitable form of voltage conversion.) Before starting, turn the TI console off. Once the mains is plugged into the console, don't turn on. Next attach the joystick and headset. When all this is done, then you can plug the MBX into the joystick port. There is a second plug which should be plugged into the cassette port. This all makes for a fair few wires, but it's not complicated. Following the instructions, next turn on the MBX console. If all's well so far, then the MBX will say ready. (It has its own built in speech synthesiser and speaker). Then you can turn on your TI99 and plug in a cartridge.

The MBX will only respond to cartridges designed for it. It doesn't work in Basic (yet). I've written to Milton Bradley to ask if they are prepared to make available a listing in either Basic or Machine code that will allow access to the unit, but for the time being, the answer to the most popular question is no.

I have eight of the ten cartridges designed for it and I intend getting the other two. Of this eight, there are two that don't use the voice recognition at all. Bigfoot and Meteor Belt. These use the analogue joystick though, but I don't think it was necessary to class these as MBX games. There are three cartridges which require the MBX. These are Baseball, (in my opinion the best game both for action and graphics) and two of the bright beginnings series, Terrys Turtle adventures and I'm hiding. Both of these are fun/educational for up to eight year olds. The rest are arcade type games which work with or without the MBX.

The speech recognition system isn't perfect. Even for the very biggest computers, there is still a fair amount of research work to be done yet, so the MBX's failings in the way it gets words confused can be forgiven. It doesn't do it often and is right more than it's wrong. The idea of developing a speech recognition system that can only be used with games can be criticised, but it does have uses that aren't immediately apparent. For example, it can allow disabled people to play games. It's still necessary to use the joystick for most games that use speech recognition as well, but the amount of effort needed is reduced. (In Space Bandits for instance, all that would be needed is the movement of two fingers for the fire trigger).

In my last piece, I mentioned the idea of using the Mini Memory as a library of machine code CALLS which would be called up from Basic. Now if someone were to write the necessary calls to enable the MBX then the possibilities for that unit would be almost endless.

My grateful thank: to young Adrian who took time off from studying for his 'O' levels to write to me to explain the use of cassette based files. I hope he also writes to TI*MES to give the same information.

There has been mention that V2.2 consoles (circa 1983 on the title screen) don't accept third party cartridges. Mine isn't a V2.2 operating system, but I still have trouble with certain cartridges and what's worse is that some of them are TI's ! The cartridges I have trouble with are : Micro-surgeon, Baseball, Sewermania and Ataris Donkey Kong. In each case the problem isn't major but it's always the same. The letters are scrambled. I can always play the games okay, but in Baseball and Sewermania I can't tell the score ! On Donkey Kong, the problem is less severe because it only happens on the title screen when it asks for you to press 2 for a two player game or press enter to start. The problem isn't catastrophic (certainly nothing as dramatic as Krakatoa) but I do like to know what I've scored so I can tell the world what a clever dick I am. (Or imbecile if I do badly).

Congratulations to Stephen & Cathy Shaw on the arrival of their latest peripheral. George Martin Shaw. (I believe that Cathy did most of the development work on this one !)

TI*MES always seems to appear after I've finished work at an exhibition, but before I can write about it. This time the show was in my native home town (Manchester). A total comparison to Wembly. The people we met were serious TI owners, and all in all a very pleasant occasion. The TI must be more popular than we thought though. On Saturday, we really could have done with an extra pair of hands at the stand. A young friend and my Father (who came to see what it was all about) commented that we had the busiest stand at the show. Granted, we were the only people there with anything for the TI !

I seem to make a habit of writing things and then updating them 10 minutes later. One of the pleasures of using a wo-pro is that you can chop and change your text until it's exactly the way you want it. With this in mind, I've just deleted the last 10 lines of text which mentioned that I had acquired a modem. (There is a difference between acquired and bought !) I've had it for a couple of weeks now, but this is first day it's been in use. So far I've made one call to Computer Answers bulletin board. I'd spent quite a while trying to get in, but thanks to the help of an American gentleman, who I believe is one of our new subscribers, I've finally done it. I can see that using this thing is going to be a bit of a pain in the phone bill until I can curb my enthusiasm, but it is amusing to be an overgrown adolescent "whizz kid". (Anybody watch that. Don't feel ashamed if you're the wrong age for it, I think it's great !).

What you need : In addition to the TI99/4A which we all have, (and if not why are you subscribing to this mag ?) you'll need a big overdraft, a peripheral expansion box, RS232 card and a modem working at 300 baud. You'll also need your terminal emulation software which comes in the form of the TI Terminal Emulator 2. (Ever wondered why it was called that ? now you know.) It also helps if you have one of the new British Telecom phone plugs. Very neat little things those. They cost about £25.00 and you get free with each packet a little man in a yellow van who'll come and fit it for you. Then plug your modem into the phone plug, your phone into the modem, the RS232 plug into the peripheral card and the peripheral box into the computer. If you're with me so far, I must be telling it wrong. Now you dial up your friendly database/bulletin board and discover that it doesn't work. This is where I came unstuck. As if I hadn't enough wires already, I then discovered that the RS232 card is wired in an interesting manner. Interesting that is if you're in good humour. My floor was starting to look like a plate of spaghetti. I could see why Alexander the Great lost patience with the Gordian knot. Good job he didn't work for British Telecom. It's not as bad as it sounds. All that has to be done is to reverse pins 2 and 3. 7 stays where it is and 8 goes off to 20. Got that ? Hmmm. Give me a ring if you're stuck. I have a set of instructions here which I'll read out to anyone curious/daft enough to trust me. The final line reads "light blue touchpaper and stand well clear."

It isn't essential when using a modem to have the disc system, but it can be useful in saving your telephone bill. Most of these bulletin boards have vast amounts of data in them and to read through it all would require you to be on the 'phone for quite a while. Imagine going shopping using one (because that's the aim of many of them) and having to read through every item before you found the item you wanted. That would involve being "on line" for quite a while. What would be handier would be to dump each screen to disc, (which the TE2 allows you to do) and then read it all back later making your decisions in a more leisurely manner. To do this, you'll need Extended Basic because there's an Extended Basic program listing given in the TE2 manual.

I see this new development in my computing career as being important. Not for the achievement, all I've done there is to wire the thing up correctly. But for the ability to not only receive data but to transmit it. I know we don't all have the full system, but as more of us acquire it, then we are reaching the stage where the postal service can be eliminated except for carrying goods. I can now transmit pages of information to anyone with the above mentioned equipment. What is equally interesting is that it doesn't have to be the same equipment. As I understand it, the whole business of communications software is done in ASCII, which fortunately everyone (except Sinclair) uses. I have read messages left by Commodores, Apples, BBCs etc. Of course I can't download their software, (maybe I could, but they certainly wouldn't run) but I can communicate with them.


Anyway, I'm off to my tailors to acquire suitable costume for this new venture of mine. (I'm going to buy a hacking jacket ?????!!**???)

If theres room and time, I'll let you know who I've managed to call up and what information I've dragged out of the guts of these machines.

Back to the TI-Writer. In my last manuscript, I waxed somewhat lyrically over this piece of software. I still think it's wonderful, but it seems to do odd things at times. If there's anyone else out there who has the thing, perhaps they'd like to answer a few questions. I vae particular trouble in writing in columns. (You know, like newspapers). Any suggestions on how to do it without going to word wrap and deleting the carriage return symbol from the previous column before you start every fresh line ? I'm going to try writing my adverts for this edition in columns, so maybe I can do it myself. Another weird point is why does the thing miss out my heading on the first page. It did it for my last script and it's done it this time too. Any theories ?

For now though, I'm saying BYE.

Howard Greenberg



~~~~~  
COMMENT  
~~~~~

A so called "Software User Association" in Scotland is offering for hire taped games to the public at £1.50 a throw. They include a number of TI tapes sold by Stainless Software, Timeless and Christine Computing. The prime reason for hiring a tape must surely be to make a copy and we feel it is in your long-term interest that this should be discouraged. If software houses cannot sell their products because they have been copied wholesale then they will cease to exist.

POINTS FROM PRESTON

Suppose you have 30 udgs to include in your program, and that the char-codes for these graphics didn't run in sequence (ie 3,4,58,9..). How would you go about using CALL CHAR? Surely you wouldn't use 30 CALL CHAR statements? You would!???

Well don't! Instead use the following example using DATA and SEG\$

Firstly our char-codes - 33 to 47 (15 udgs), 58 to 64 (7 more) and 91 to 95 (5), and finally 123 to 125 (the last 3)

Okay, so these numbers do not have a pattern. Now put all of your HEX nos. into DATA statements (eg 10 DATA FF453278,556565FA,) and remember by re-editing a line you can actually have six lines and not four. Also, if a HEX number ends in zeroes there is no need for them, so don't waste space.

Once your HEX codes are in DATA statements then we can begin the actual routine to READ them into CALL CHAR:-

```
10 DATA .....HEX codes
20 DATA .....Ditto.....

100 A$="!"#$%&'()*+,-./:;<=
>?@[^\_`{|} "
120 FOR K=1 TO LEN(A$)
130 READ B$
140 CALL CHAR(ASC(SEG$(A$,K,1
)),B$)
150 NEXT K
160 ....Main Program
170 .....using the characters
180 ...from A$ as udgs
```

The above can be altered to use more udgs simply by having more HEX codes and more characters in A\$. The above routine should cut out all those CALL CHAR(33,"FF453278") CALL CHAR(34,"556565FA") etc.

I have received a lot of programs to review over the past few weeks. A lot were let down by the programmers' lack of concern for detail: Instructions should be pleasing to the eye - easy to read. At the beginning of a game give the user an option to see the instructions (especially if there are several screens). Where a one-key response is required use CALL KEY and not INPUT. Why not include a little tune while the user reads the instructions. Many a program is marred by quickly written instructions.

Graphics - There can really be no excuse for poor graphics, with the TI you can have up to 128 which is plenty. Good graphics can lift a game no end. Colours - Not everyone gets the chance to use the colour TV for their computing, so when deciding your CALL COLORS remember to turn the colour off a moment to view it in mono. Do the graphics stand out?

I personally think that a good game should include some of the following points:-

- Option for instructions (instructions Y/N?)
- Plenty of good graphics
- 3 lives (or more)
- High Score Table (with names)
- Skill levels (no more than 5)
- Sound (not just Beep Beep)
- User defined cursor & fire keys

All in all if you have written a game spend some time putting in a little extra. It can make a good game better, every time.

A couple of routines

HEX TO DECIMAL & DECIMAL TO HEX

```
10 A$="0123456789ABCDEF"
20 CALL CLEAR
30 PRINT :::"1. HEX TO DECIM
AL":::"2. DECIMAL TO HEX":::
40 CALL KEY(5,A,B)
50 IF B<1 THEN 40
60 IF A=50 THEN 140
70 IF A<>49 THEN 40
80 INPUT "INPUT HEX ":B$
90 IF LEN(B$)<>2 THEN 20
100 A=(POS(A$,SEG$(B$,1,1),1
)-1)*16+POS(A$,SEG$(B$,2,1),
1)-1
110 IF (A<0)+(A>255)THEN 20
120 PRINT :B$;" HEX =";A;"DE
130 GOTO 80
140 INPUT "INPUT DEC ":A
150 IF(A<0)+(A>255)THEN 20
160 PRINT :STR$(A);" DEC = "
;SEG$(A$,INT(A/16)+1,1);SEG$
;" HEX":::
170 GOTO 140
```

This program simply converts any hexadecimal (2 digits in range 0-9 and A-F) to its equivalent decimal number and vice versa. So now you can open up your computer magazines and find decimal listings (ZX Spectrum BBC ... etc)and use their graphics for your own games.

The program offers you a menu of 2 choices. When you have chosen the particular routine that you want a Loop will be entered, so that you can enter your nos. one after another. To get back to the menu simply enter 999. Easy! Any mistakes and you will either get a WARNING or be taken back to the menu.

The next routine was written for a man who took advantage of my offer of help in programming. It is a Bingo Number Calling routine which calls all the numbers (at random) found on a Bingo-Card (1 - 90) and at the same time places the number in its appropriate square.

If you have a small problem (as big ones take a lot of time) with your programming then just drop me a line and I will try to help. Please enclose a S.A.E. Thank-you.

TI-99/4A BINGO-CARD CALLER

```
10 CALL CLEAR
20 FOR K=97 TO 108
30 READ A$
40 CALL CHAR(K,A$)
50 NEXT K
60 DATA 1818181818181818,181
818FFFF181818,1818181F1F1818
18,1818181F1F,0000001F1F1818
18,000000F8F8181818
70 DATA 181818F8F8,181818F8F
8181818,000000FFFF181818,181
818FFFF,000000FFFF,FFFFFFFFF
FFFFFFFF
80 PRINT "      TI-99/4A BING
O CARD":"ekkkkkkkkkkkkkiki
kkkkkkkf"
90 FOR K=1 TO 9
100 PRINT "a a a a a a
a a a a":"ckkbkkbkkbkkbk
kbkkbkkbkkbkkh"
110 NEXT K
120 PRINT "a a a a a a
a a a a":"dkkjkkjkkjkkjk
kjkjkjkjkjkkg":" PRESS SPAC
E-BAR FOR NUMBER"
130 RANDOMIZE
140 FOR L=1 TO 90
150 K=INT(RND*90)+1
160 D=(INT(K/9)=K/9)+1+INT(K
/9)
170 A=K-(D-1)*9
180 K$=STR$(K)
190 IF K>9 THEN 210
200 K$=" "&K$
210 CALL GCHAR(D*2+1,A*3+2,K
)
220 IF K<>32 THEN 150
230 CALL SOUND(110,110,0)
240 CALL KEY(3,A,B)
250 IF K<>32 THEN 240
260 CALL SOUND(110,810,0)
270 FOR B=1 TO 3
280 CALL HCHAR(D*2+1,A*3+1,1
08,2)
290 CALL HCHAR(D*2+1,A*3+1,A
SC(SEG$(K$,1,1)))
```

```
300 CALL HCHAR(D*2+1,A*3+2,A
SC(SEG$(K$,2,1)))
```

```
310 NEXT B
```

```
320 NEXT L
```

When you run the program the Bingo-Card will scroll up the screen, and a low note will sound to signify that a number is ready. By pressing the space-bar this number will 'flash' onto the correct square and another note will sound for the next number and so on ...

PRINT statements can be used with far more success than CALL HCHAR. A full screen can be made up from about 4 or 5 PRINT lines. You may say that 1 CALL HCHAR statement can fill a screen. But not with DETAIL!

PRINT is generally faster than lots of CALL HCHAR statements, although the latter can present a game nicely (provided it doesn't take too long to set up). By using a combination of PRINT and CALL HCHAR well

A lot of people are under the impression (from a few games that I have been looking at) that when using IF THEN statements you must also use ELSE. Personally, I rarely use ELSE but I have seen it used as follows ...

```
230 IF A=87 THEN 100 ELSE 240
```

```
240 .....
```

This is silly, if A doesn't equal 87 then the computer will automatically "drop" into line 240. I have even seen an ELSE statement directed to a GOTO line!

If anyone would like to write to me - I live at

35 PARKER ST. PRESTON LANCS PR22AH

Paul K Dunderdale

PiKaDee Software

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★ ★ ★ ★ ★
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Arcade action with Rivets! You have to pick up all of the rivets left lying around by your workmates. The boss is timing you so you had better be quick. Beware the banana skins and don't run too quick as it's a long way down to the ground. 5 skill levels. 21 floors. Timer. "This is a must for all game players." CHARSET TWO (PICA) is the second off-the-shelf character set for your own games. Instructions included.

PKD4: ESCAPE FROM MICA! by B Dhooper

£4.95

This has to be the most addictive arcade game yet for your unex-TI-99/4A! You've been captured by the Count of Mica. To secure your release you have to collect valuable items from 3 fields. These fields are guarded by a terrifying monster who eats people like you for dinner!!! The Count has given you 4 Hyperspace pills — use them wisely. This is a very entertaining game with 4 skill levels, animated running, good graphics, sound and a High-Score table. Not to be missed!

All cheques, PO's etc... to **PiKaDee Software**
Proprietor: PAUL K. DUNDERDALE

FRIENDLY GAMES

Graham Baldwin.

Most people seem to enjoy writing an occasional graphics game, perhaps because it's the reason they bought a computer in the first place, or as a bit of light relief from exploring the darker depths of their TI-99/4A. In this short series of articles I'll be suggesting a few simple ideas for making these games a little more user-friendly, particularly from the point of view of non-computer users.

TITLES

Let's start at the logical beginning with title screens, because this is where you can tempt your player into either exploring your game or dismissing it entirely.

We've all seen a bald line of print, saying "GALACTIC HEM-A-ROIDS" or whatever scrolling up the screen until it reaches the approximate centre, but we can be a little more adventurous than that. It looks far more professional if the title appears 'in one go' on the screen, without scrolling. We can do this quite simply by changing the colours of the characters to that of the screen, printing them, then altering the characters to a contrasting colour. Alternatively we could first change the screen colour to that of the characters, ie black, and save ourselves the first step.

```
100 CALL CLEAR
110 CALL SCREEN(2)
120 PRINT TAB(7);"THIS IS A TITLE":::~::~:
130 FOR A=2 TO 8
140 CALL COLOR(A, 16, 1)
150 NEXT A
160 CALL KEY(3, K, S)
170 IF S=0 THEN 160
```

This is an improvement, but we could make it prettier by varying the colours of the characters while waiting for a key to be pressed. This we can do by the addition of one line:-

```
165 CALL COLOR(INT(RND*7)+2, INT(RND*14)+3, 1)
```

We could also add another line to play a sound while waiting to continue.

```
167 CALL SOUND(-200, INT(RND*800)+200, 1)
```

I've used the now well-known 'Print At' simulation in TI BASIC for titles and instructions in the past, which displays characters at a slow reading speed. This looks fine the first time a player sees it, is irksome the second time and unbelievably tedious thereafter.

Another, more impressive, title screen can be made up of multiple print lines containing re-defined characters to form man-sized letters when displayed on the screen. It's rather hard to describe but the following short program to print a large 'L' should give you the idea.

```

100 CALL CLEAR
110 CALL CHAR(37, "FFFFFFFFFFFFFFFF")
120 PRINT "%%"
130 PRINT "%%"
140 PRINT "%%"
150 PRINT "%%"
160 PRINT "%%%%"
170 PRINT "%%%%"
180 GOTO 180

```

With a little imagination this method can give you a superb title screen, even if it does leave rather less room for the program...

Calling HCHARs and VCHARs to make a border of some sort can improve the title still further, but don't use them until you've finished printing or they'll scroll off the screen!

Working out a display of this type means a lot of hard work with squared paper, coupled with VERY careful counting of spaces if the result isn't going to resemble a Chinese takeaway order for egg foo-yung.

By the way, I prefer to DIM all arrays, define characters and so on before printing the title, so that the player doesn't have a long wait to get into the game after the title is shown.

INSTRUCTIONS

Game instructions in a program can burn up an awful lot of memory so I usually leave them out until the game is complete to be sure I have enough memory left to contain them. In practise there's usually enough room for at least a reminder of which keys control what in the game.

If your program contains game instructions it is polite to offer the player the option of bypassing them, because after playing the game a few times he won't be amused at having to wade through several screens-full of text he knows by heart every time he plays.

```

200 PRINT "WANT INSTRUCTIONS?"
210 CALL SOUND(200, 800, 5)
220 CALL KEY(3, K, S)
230 IF S=0 THEN 220
240 IF K=78 THEN... (By-pass instructions)
250 IF K<>89 THEN 210
260 PRINT (Instructions)

```

This attracts the players' attention with a discreet 'beep' and won't let him go further until he presses "N" (ASC 78) or "Y" (ASC 89). If he can't handle that decision lead him gently but firmly away from your precious console.

While on the subject of idiot-proofing let's mention skill levels. Some games need an adjustment factor built in so that the youngest daughter as well as teenage tearaways can play the same game. We can ensure that only the information we want can be entered by use of another 'mug-trap'.

The following program gives a simple key choice of 1 to 5, which, being consecutive, is easy to trap. I'll be looking at more sophisticated validations of key-presses a little further on in this article, time, space and coffee-breaks permitting.

```

400 PRINT "GIVE YOUR SKILL LEVEL (1 to 5)
410 CALL SOUND(200, 800, 1)
420 CALL KEY(3, K, S)
430 IF S=0 THEN 420
440 IF(K<49)+(K>53) THEN 410
450 SKILL=K-48

```

Line 440 will refuse to accept any key-press outside the specified range 1 to 5 (ASC 49 to 53) and line 450 will convert the code of the chosen key to a value of 1 to 5 and place it in a variable, SKILL. With a suitable formula you could, of course, convert the key-codes to any consecutive range you require.

Notice that so far the INPUT statement hasn't been mentioned. I prefer to leave it out and rely on CALL KEY for several reasons. First, the player can get into the game a little quicker, second, novices at computing don't always realise that the computer effectively ignores an INPUT until the 'ENTER' key is pressed, and third, it saves wear on the ENTER key, which, if you think about it, is the only key you HAVE to use on every line when entering a program!

The next short program will give a range of 1 to 4 from the keys A, K, Q, Z. (I can't imagine anyone wanting to use such an odd arrangement but it may come in useful for a mnemonic menu of some sort.)

```

100 PRINT "SKILL LEVEL? (AKQZ)"
110 CALL KEY(3, KEY, S)
120 IF S=0 THEN 110
130 SKILL=POS("AKQZ", CHR$(KEY),1)
140 IF SKILL=0 THEN 110

```

Line 130 is the one that matters here; it is checking where our key-press appears in the sequence and assigning a value to the variable SKILL as appropriate. If some other key was pressed the value would be zero, bouncing us back to line 110.

SOUND

I'll round off this first article with a few thoughts on sound in games. As sound is so subjective I can do little else except air my prejudices on the subject. For instance, have you tried the TI Blasto game? To me this demonstrates about the worst use of sound yet devised for a game. The continuous 'orrible music nearly drove me to distraction after a couple of games and I haven't bothered with it since. On the other hand Parsec has almost excellent sound which complements the game. The proof is that Parsec is very hard to play with the sound turned off!

The next article in this series will continue with sound, move on to cursor keys, graphics, high or low score displays and anything else I can think of in the next month or two.

Happy computing,

Orlando

RANDOM EYES.

Have you noticed that now the TI-99/4A is no longer in production the magazines are changing their tune about it? Previously, few had a good word to say about it, and a regrettable minority printed some unmitigated rubbish. I'm thinking of the mag that complained bitterly about the position of the on/off switch (most of its rivals don't even HAVE one), the mag that told us that complex arithmetic calculations are required to move a graphics character (is row=row+1 complex?) and the mag that swore, hand on heart, that the only add-on that could be used without the Box was the Speech Synthesiser! Nary a mention of Extended BASIC, Mini-Memory or even the joysticks! Others seemed content to dust off reports of the previous model and go through the text, adding an A to the TI-99/4.

But now our computer is an orphan, what do we read in the computing press? "This fine machine...many advantages over its rivals...a Mercedes among Volkswagens...sadly discontinued". Don't they ever read their back-copies?

Perhaps I'm being unfair to the magazines but they seem to have got their message across. Witness the recent conversation I had with a non-TI computer owner. After admitting ownership of a TI (which can be like owning up to dubious parentage in some circumstances) I was told, with some force, that: "The TI is rubbish". After questioning him I found he'd never used a TI, had never seen one in operation but had got his information and picked up his opinions from magazines. A familiar story to many TI owners, I'm sure.

Having submitted one or two programs to magazines (and if anyone bothered to type them in, let me apologise here and now) I found I suffered two separate reactions after publication. First, a certain pride at seeing my work in print, quickly followed by a sinking feeling as I examined the listing, which I had never seen 'in one lump' in its completed form, because I did not own a printer. It was a pretty mortifying experience spotting where I could have used a sub-routine here or a better way of setting up graphics there and so on.

Like most married computer owners, my programming has to be fitted into odd corners of the day and evening, and despite flow-charts and hand-written original listings a program often gets modified over the weeks and months without a record being kept of all the changes, and as we all know, sorting out a listing from the screen alone is unrewarding, to put it mildly. Therefore I was delighted to receive my Alphacom printer from Arcade Hardware, which should make life much easier when developing a program. As Howard would be the first to admit, the Alphacom is not up to word-processing work and its print quality can't compare with a daisy-wheel, but for program listings or a quick screen-dump it is ideal.

Time is too short for a full road-test this issue; if no-one else offers I'll try to write it up for the next.

(OK, a quick look to fill this page. It will list a program complete or between specified line numbers, print string or numeric variables on request, perform a rapid screen-dump and do lots of clever things with control codes. Speed is about 70 or 80 c.p.s., it plugs into the side port and uses thermal paper. Price is £115, replacement paper rolls are about £6 for five. Unfortunately the hand-book is written in American and follows the TI tradition of giving no technical information whatsoever.)

I recently bought a copy of Pete Brooks' new book, 'Mastering The TI-99' and, as you would expect from Pete, it is full of useful information, ranging from simple "why didn't I think of that" hints up to some quite intricate graphics handling routines. Chapters include translation from other dialects of BASIC, debugging advice and a gentle introduction to cassette file-handling. This last should answer the pleas of all those who long ago gave up trying to make sense of the Sanskrit version in the TI handbook. Thanks, Pete. A very worthwhile book.

Having played with Parsec on and off for a few months I've noticed a bug that I haven't seen reported before. Very occasionally, after passing through an asteroid belt, the ship explodes with a 'crash with ground' message, even though it's at the top of the screen! I haven't been able to gather much circumstantial evidence about level of play, ships remaining and so on and would be interested to hear if anyone else has noticed this problem. (Nasty afterthought: perhaps my console or module is faulty!)

Don't you just love the advertising industry? It has given me a lot of harmless amusement over the years but reaches new heights when it gets its claws into the home computer industry.

We've all seen the optimistic claims for RAM space, the inferences that the *** micro can be used for sophisticated business applications and the notorious '28 days delivery' promise, but the weasel-word that always appeals to me is 'power'. What is processing power? Is it clock speed, memory access time, quality and speed of the resident language or a mixture of these and many other factors? The answer is, of course, that it depends on what you want the computer to do. A games programmer would want flexible, easy to use graphics and sound, a scientist may need fast, accurate number crunching to umpteen decimal places while a businessman would prefer first-class file-handling capabilities and CP/M compatibility. In view of this, what have some advertisers claimed to prove the power of 'their' micro? The amount of RAM! On the face of it the claim sounds good, because big numbers are, in themselves, impressive, and statements like 'twice the memory of its competitors' have a fine ring to them, but let's make an analogy for a moment. If we consider a car as a computer its engine can be regarded as the microprocessor, the controls as the operating system and the driver as the programmer. So where is the RAM? Surely it's the boot space, the luggage-carrying capacity, and to the best of my knowledge no advertiser has yet claimed that a Ford Escort is more powerful than a Grand Prix Lotus, so why do they try it on with computers?

Anyway, having plumbed the depths of inconsequence I'll finish off with a few quickies.

Did you know that...

...there's no need to type EDIT (linenumber) in TI BASIC? Just the line number and FCTN E or X will do it...

...when a program passes over CALL KEY the return-variable is set to -1 if no key is pressed? (I can't think of a use for it off-hand, but it's there if you want it)...

...in Ex-Bas, RUN can be used as a program statement and RUN(first line) will start your program off again, resetting your variables? (Not as painful as it sounds)...

I don't claim anything original for these; I offer them in case some people haven't come across them before.

Happy computing



PIRACY



A subject I dealt with in TIDINGS some time ago, it has seen a great number of letters in the popular computing mags, mainly very uninformed opinions.

At the time of writing I have just identified nearly fifty cassettes, ostensibly by STAINLESS SOFTWARE, but actually made by an unauthorised person. Legal action is pending, so my comments must be most careful, but all the titles which have been pirated were supplied to BLUE CHIP COMPUTERS and to no other single person.

The pirated tapes are easily identified: the standard green printed STAINLESS SOFTWARE label is precreased. The pirated label has a fold line, easily visible on the left of the label... just a short green line, indicating where the fold should be. These tapes came to my notice as a result of poor quality.

Because of the size of Stainless Software, a civil action for damages is not practical, but criminal action is being pursued... I won't receive compensation, but at least the culprits will not have made a profit on their venture.

The software market generally is in decline, and a number of software houses... maybe half ... will cease trading this year, in some cases involving the loss of very good programs. I know of at least one TI supplier who will cease supply shortly.

Under these circumstances, with the vast profits talked about in magazines clearly not being seen, the action of unpaid copying is highly destructive to the industry. Why should a programmer spend even two hours writing a program (very few take that short a period!!!) if he is going to receive nothing for his time? Why should a publisher bring out new programs?

A few companies ARE making profits, where they have a number one best seller for a popular machine, and can take advantage of economies of scale. For TI suppliers, the TOTAL market is less than these top sellers can expect to sell!!!

Of the dealers named by TI when they withdrew, half of them are involved with pirate copies of my tapes. Please don't be too surprised if I am not very keen on dealers! They seem intent on ripping everyone off, supplier and customer.

Please would you bear these points in mind when reading letters on piracy. There is room for general discussion on payment for creative works of all kinds, but in my opinion, the highest quality will not be seen unless there are suitable rewards.

I must hasten to add that not quite ALL dealers are interested in money and nothing else (although, commerce being commerce, it is important!). I can strongly recommend Galaxy Video, Maidstone; Parco Electric, Honiton; and Arcade Hardware, Manchester. These persons are struggling against the odds to supply a small market with rare and hard to obtain products.

STAINLESS SOFTWARE (Proprietor: Stephen Shaw)
10 Alstone Road STOCKPORT Cheshire SK4 5AH

RAMBLES

Greetings once more.

First, family news: The Shaw family was augmented by a little nybbler named George Martin on 22nd May, at a sufficiently early hour to permit his mother to have a full breakfast afterwards! All are well and suitably sleepless...

Since the last Rambles a whole host of new products have been seen or purchased, and a package of reviews will follow, edited if required by Clive!

Also, many interesting enquiries have come in, one of them leading to an interesting discovery, so we'll take that one first:

```
IF A=4 THEN 100
IF A=4 THEN GOTO 100
```

TI BASIC requires the first entry but EXTENDED BASIC will allow either version. What is the difference? One word, GOTO, which uses up one byte. Anything else? YES!

```
IF A=4 THEN 100 :: IF A=5 THEN 200 :: IF A=6 THEN 300
IF A=4 THEN GOTO 100 :: IF A=5 THEN GOTO 200 :: IF A=6 THEN GOTO 300
```

These lines ARE NOT equivalent in practice.

The Extended Basic manual suggests that following the condition (A=4), if the condition is not met, program control will pass to the NEXT STATEMENT, eg IF A=5 etc.

If your program is in the first form, this indeed happens. However, if the condition is followed by anything other than a line number (eg the command GOTO) then the program passes to the NEXT LINE.

In order for the second version to function as intended, you need to replace the double colons (::) with the word ELSE. This makes it function as the first version.

Interesting!!

One package obtained recently (more later...maybe!) was TI FORTH. This is supplied as a fully printable disk, complete with explanatory REMS. Hence, from Screen 3, we learn how to disable the quit key! Either Extended Basic and 32k ram OR the mini memory are required:

```
(Extended Basic requires you to use CALL INIT first).
CALL LOAD(-31806,16) will do it!
```

At the time of writing it was doubtful if UK made 3rd party modules would make it... mainly due to greed by the licensing parties. Pity.

I did have the pleasure for just an hour of playing the long advertised THORNE EMI modules for the TI99/4A. These were made to plug into the right hand port, not the usual module socket. VERY nicely made, with bare wafers, gold plating, screening... excellent job. Good programs too. RIVER RESCUE had the very smoothest horizontal scroll ever seen on the machine. Bearing in mind THORNE have these modules actually manufactured and ready for sale, you wouldn't believe the amount they want guaranteeing before they are prepared to release them! Very strange industry this.

ASSEMBLY LANGUAGE:

As they stand, Editor/Assembler cannot save to or load from tape, and Mini Memory cannot save to disk. Although these utilities are omitted from the standard packages, you could write your own small assembly language program to do it. I am presently in course of obtaining a program for Stainless Software to retail which would do at least some of this work!

ACCURACY

I am sure you are well aware of the accuracy of your computer, with its ability for instance to go through a loop:

```
FOR I = 1 TO 100 STEP 0.1
PRINT I
NEXT I
```

...and have every value of I printed as an integer (try it on a Spectrum sometime)...

More news on accuracy:

Take the number 1.0000001, and raise it to the power of 134217728... that could be entered as 1.0000001 ^ 134217728.

If you have an IBM PC, it will give you the answer 8850273. An Apple will tell you the answer is 22723.9709

Try on your 99/4A two versions of the same calculation:

A. PRINT 1.0000001 ^ 134217728

```
B. 100 A=1.0000001
110 FOR T=1 TO 27
120 A=A*A
130 NEXT T
140 PRINT A
```

Have a think about the answers you see.... back to this in a couple of pages.

SCIENTIFIC AMERICAN, to whom I am indebted for the IBM and APPLE figures, and also the correct figure!, suggests that for accurate calculation to many hundreds of places, you could use separate bytes of memory for each digit, writing your own simple routines to 'carry' numbers from the tens byte say to the hundreds byte. To do this on the 4A you do need memory expansion and either MiniMem or Extended Basic.

Something to think about and perhaps experiment with.

Another question: How do I print a long data list without it vanishing off the top of the screen? The data is read from DATA statements in the program.

Answer: Use CALL KEY as follows:

```
100 FOR T=1 TO 500
110 READ A$
120 IF A$="END" THEN 2000 (last item read)
130 PRINT A$
140 CALL KEY(3,Z,X)
150 IF X=0 THEN 130
160 IF Z=13 THEN 3000 (go somewhere else if ENTER is pressed)
170 NEXT T
```

Hold a key down to read and print.
Release the key and the scrolling halts. Press again to resume.
Press ENTER to jump out!!

TE2:

To list a program verbally with Terminal Emulator 2 in place, use LIST "SPEECH"
 ... There is a very similar program available on disk for Extended Basic,
 called Text to Speech. As far as I know it was never offered for sale in the
 U.K. I have asked TI (USA) if I can sell their disk based software, but of
 course, no reply! Frustrating when you find out what they kept from us.....

Apropos the ATARISOFT modules, Richard Blanden has now taken a peak at them,
 and confirms the gross error made by Atari's programmers: For their title
 screens in a few of the TI modules, and in at least one game screen (Picnic
 Paranoia) they have used the large character set (used in the opening 'test
 card' screen only). They have addressed this in the GROM directly, instead of
 using the handy index which is also there. Now... the GROM has suffered quite
 a few rewrites, and the direct addresses have altered accordingly.

..no problem if you use the index! Notable at the end TI made the same
 error... at least it occurs in a module made by TI, for Milton Bradley,
 SEWERMANIA (game not affected).

The Atarisoft modules would be very much better if they were programmed with
 due care, and one can only hope that ATARISOFT pull their fingers out and do
 some rewrites. Unlikely I agree. The delay is bringing us the new modules, such
 as Pole Position, is basically due to Atari UK not being in the slightest bit
 interested in selling their product. They have no interest in the product
 itself either. Far worse than TI.

Now...in the last issue I mentioned a TI booklet describing extra calls
 available in Basic when the PRK or Stats modules were inserted...this is still
 available, in Xeroxed form, for 1.00 inc. p&p. The following example of its use
 is to whet your appetite a bit. Full of REMS:

TRANSFERRING PRK FILES TO TI WRITER COMPATIBLE FILES

CONSOLE SET UP:

INSERT PRK MODULE AND THEN SELECT TI BASIC (Stats module may also be used)

FIRST: IS DISK CONNECTED? USE CALL FILES(1), NEW
 THEN: USE: CALL P(10900) then NEW

Console memory is now set up

RESTRICTIONS:

The disk system and this program use up memory.
 It may be necessary to delete some records from the PRK file to be transferred
 if the PRK file fully utilises system memory.

```

      load prk file
100 CALL L("DSK1.PRKFILE",Y)
      is file loaded?
110 IF Y=0 THEN 310
      NOW open output file
      NB: do not open output file until after Call L!!
120 OPEN #1:"DSK1.TIW_FILE",DISPLAY ,VARIABLE 80
      How many fields in each record?
130 CALL H(1,5,0,F)
140 PRINT "FIELDS";F
      How many records (pages)?
150 CALL H(1,6,0,R)
160 PRINT "RECORDS";R

```

CONTINUED OVERLEAF.....>


```

      Now loop: through each record:
170 FOR I=1 TO R
      and through each field in turn
180 FOR T=1 TO F
      Is the field a number or a string?
190 CALL H(1,10,T,TP)
200 IF TP=1 THEN 240
      for numeric data:
      get the data in record I, field T
210 CALL B(1,I,T,Z,RD)
      and print it to disk
220 PRINT #1:RD
230 GOTO 270
      for string variable data:
240 CALL B(1,I,T,Z,RD$)
250 PRINT I;T;RD$
260 PRINT #1:RD$
270 NEXT T
      insert spacing as required
280 PRINT #1:" ";;;
290 NEXT I
300 END
310 PRINT "NOT LOADED"

```

If required, string and numeric data can be concatenated to the preferred format before printing to disk. Read each required field, concatenate, and print.

Each print to disk should be considered as one TI Writer line:

Use of pending outputs is to be avoided, as is the use of a semi colon print divider, due to the complex requirements of DISPLAY format.

I suspect it is possible to do some very interesting things with these modules. They enable you to save data in memory image format, much faster and using less storage medium. The other way of course is to use MiniMem as an electronic disk, and dump the contents of MiniMem in memory image using EasyBug 'S'.

Thanks to those of you good enough to write and say 'thank you'.... at a time of personal stress I have recently received some pretty nasty letters, such as a two page letter tearing to shreds a program which had received a 5 star review. I regret that there are some people if they disagree, go completely overboard, to their own detriment. Letters of thanks at such times prevent one overreacting and throwing the towel in! Stainless Software operates on tissue thin margins, mainly for fun; there would be no point in continuing if my services were in vain! Thanks again for the NICE letters. They are appreciated. (But constructive well mannered criticism is always welcome!).

The correct answer to the puzzle a few pages back is: 674530.470741078

This makes the IBM look very silly indeed.

The TI99/4A is 0.0000671% out when using the ^ operation, and it is 0.000022638% out when using the looped multiply routine.

That is pretty accurate!!! Is there a more accurate computer out there somewhere?

It may be useful to look closely at a program many of you received.... PARCO sent out some 20,000 fliers for a new magazine ("1st issue sent in May...ho ho ho! Not here by 10th June!)...on the back was a program in TI BASIC.

If we look at how it can be improved, maybe something can be learned!

NB: This is not a criticism of the program!!

Please see next page.....>

'Your first free program' from PARCO flier.

"GAME OF CHASE"

Lines 140 & 150: Two print lines could be dealt with on one program line (this comment applies generally where PRINT is used):

thus:

```
140 PRINT "WELCOME TO THE GA
ME OF CHASE-----
-----";;
```

(Did you notice the original has spaces between the colons there: that is because the program has been listed in EXTENDED BASIC. When keying in in TI BASIC, you can put the colons together, without spaces.)

LINES 440 & 450: Can be put together using the TI Basic equivalent of "OR":
440 IF (KK<1)+(KK>20) THEN 430

LINES 620-680: The use of INT is not really required here, the computer will automatically use an integer value. This applies to most commands, but not all: refer to your manual, which says when a value can be a fraction.
eg for CALL HCHAR:

"If the evaluation of any of the numeric expressions results in a non-integer value, the result is rounded to obtain an integer"

Thus, if you drop the INT, you should also reduce the multiplicand by one, as a rounded value is not quite the same as an integer: instead of 24*, use CALL HCHAR(23*RND+1,30*RND+1,72).

This method will slightly reduce the chances of a character appearing at the boundary, and on occasion it may be required to use the INT expression.

Lines 1060 to 1130 are quite wasteful. When checking a whole range of possible inputs, it is far neater to use POS. The following new lines have the same effect as the original lines 1060 to 1140:

```
1060 IF F=0 THEN 780
1070 ON POS("WERDCXZS",CHR$(F),1)+1 GOTO
780,1230,1260,1280,1310,1330,1360,1380,1410
```

It may be a long line but it does save memory and speed!

Note the test in line 1060: If no key is pressed, CHR\$ will give an error, so we must ensure the CHR\$ is skipped if no key is pressed!!

Not a bad little program really..... have these notes helped you at all?

If you do have any problems, share them! Drop me a line. For a personal reply, a stamped envelope with your address on it is a MUST, and a reply may take 10-14 days! I regret I cannot give assistance with non-standard peripherals nor with assembly language.

Address: 10 Alstone Road, STOCKPORT, Cheshire, SK4 5AH

Don't forget the post code! OR the S.A.E. !!!

One writer passes on to me some 'bugs' in PARSEC:

The number of ships you have is held in one byte: if you go over 256 ships in reserve (phew!!!!) the counter resets to one (awww!).

Fly the first screen as usual and crash into an asteroid. Then press REDO. When the next ship is flying, crash into the ground without firing! Then fly the next ship as usual... you aren't on the first screen anymore and a new ship appears (new to those of us still trying to get past the first screen!!!!).

Because speed is also held in one byte, strange things happen as the speed gets faster and faster! Any other bugs found!

TI MULTIPLAN is another advanced program to be released, on disk, plus module, plus huge manual.

MULTIPLAN has the advantage of being a highly standardised program, so you can buy a book for MULTIPLAN which covers any implementation.

I bought a copy of THE POWER OF MULTIPLAN which has some ten worked examples for you to key in. This gives you practice in entering and using Multiplan, as well as some ideas for its use.

The keystrokes described in the book work exactly as printed on the 4A. Nice.

MULTIPLAN is a 'spreadsheet' which is useful for all occasions where you use paper with lots of columns on... bookkeeping, balance sheets &c. Because you can interlink various items, you can change the cost of one element and see what result that makes on profits, quickly and easily.

Programs such as this have been a considerable help in the financial centres, where the effects of a .01% change in exchange rates needs to be known FAST!

THE POWER OF MULTIPLAN also shows how you can use it for producing invoices, with description, price, discounts etc all printed merely by entering an item number.

I now have quite a collection of thick manuals.... my local Xerox copy shop have laminated the covers and spiral bound them for me, at a fairly low cost, and I find them much easier to consult than trying to use the huge thick binders TI supply!!!

It appears that both we and the console are being fooled as to what is in the modules... Extended Basic for instance appears to have 3 GROMs and 2 ROMs... but inside about 34k seems to be on one HUGE chip... and there are two chips which seem to be RAMs.

Taking one Milton Bradley module apart, again what seem to be two RAMs. Now... what are they for... what do they do...? They don't seem to be directly available. Possibly the MBX modules use them to store a record of your voice?

Do you write programs in Extended Basic? Do you use sub-programs?

When the BBC computer was launched a great deal of fuss was made about it having multi line named procedures with local variables... now guess which computer really had these first!!! TI just calls them sub-programs.

EXAMPLE:

Suppose we have a program in which the colours of character sets 1 to 8 are regularly changed.

It could be done with a subroutine, setting variables and then using GO SUB:

```
200 X=2
210 Y=4
220 GOSUB 800
.....
800 FOR T=1 TO 8
810 CALL COLOR(T,X,Y)
820 NEXT T
830 RETURN
```

In Extended Basic we can create a sub program called COLOUR (NOTE: English spelling!). Sub programs MUST appear at the end of your program. Only other sub programs can follow them.

Example:

```
200 CALL COLOUR(2,4)
...
2000 SUB COLOUR(X,Y) :: FOR T=1 TO 8 :: CALL COLOR(X,Y) :: NEXT T :: SUBEND
```

Thats it!

continued.....

In this example of a sub program, we have passed two VALUES to the sub program, which are taken by the local variables X and Y in the subprogram.

If X and Y are used in your main program, or indeed in other sub programs, their values are NOT changed by their use here! This X & Y are unique to this sub program.

If instead of numbers, we use variables CALL COLOUR(A,B), then in this form, the values of A & B may be changed in the sub program.

Further example:

```
CALL EXAMPLE(A,B)
...
SUB EXAMPLE(X,Y) :: X=2*X :: PRINT X :: SUBEND
```

In this format, if A=2 and B=4 when the CALL is executed, the values of A and B are passed to X and Y in the sub program. At the end of the sub program, the values of X and Y are passed BACK to A and B, thus the sub program has changed variables in the main program.

If you do not want this to happen, it doesn't have to. You have the option:
CALL EXAMPLE((A),(B))

The same SUB will take its values from A and B, but at the end of the sub program, A and B will retain their original values: they will not be changed by the sub program.

Powerful programming this! Take another look at your manual and experiment a little.

STAINLESS SOFTWARE

ADVERT

BILLY BALL PLAYS CATCH in EXTENDED BASIC £6.00

By R Trueman. JOYSTICK REQUIRED.

Billy catches various objects through several screens while avoiding one of his old enemies (a sharp punch on the nose can be useful sometimes!). Nice screen design and plenty of variety. Lots of fun and not too hard.

THE BEETLE RUN in TI BASIC by R Trueman. £5.00

Guide a beetle around several screens. Manual dexterity is useful for this program. Uses keyboard controls. Nice use of TI Basic.

FORCED ROUTE in TI BASIC by A. Walker. £6.00

A board game for two players. The name refers to the method of movement: you may move one square in any direction indicated by the square your opponent is on. His moves are dependent on the square you are on. There is lots of room for careful planning and strategy on this one! and the board is different each time you play, for greater variety.

GREEDY GREEN GRABBERS in TI BASIC by Paul Dickinson.

Written in TI BASIC. £5.00

A 'thinking mans pacman'... on various green mazes you must avoid an increasing number of nasties and collect dots for points. Use tactics to keep your pursuers at a safe distance. Not real time: allows you to think! Your enemy only moves when you do! TI Basic so not especially fast action.

DUNGEON GOLD in TI BASIC by P Dickinson. £6.00

Another maze type of game, but this time only one room at a time is on screen. You must locate and retrieve gold, again and again, each time the monsters you meet are more aggressive. With your gold, before you reenter for more, you may purchase spells and potions. They help to keep you alive a little longer!

Latest programs, in just before press date:

NEW PROGRAMS:

ALPHA T'OMEGA: Extended Basic. £6.00

A word forming game for two players. Fills the gap following the non-appearance of the Scr----- module. Friendly entry procedures. By A Walker.

CRAZY CLIFF: Extended Basic by R Trueman. £7.00

An incredible game in which you must climb up the outside of ever taller buildings, avoiding closing windows, nasty people who throw flowerpots, low flying aircraft... and lots more. **JOYSTICK IS REQUIRED** for this game. Good fun.

SNAKES & LADDERS plus **FIRELADY** in **TI BASIC**. £5.00

The old board game plus a variant, for one or two players. Interaction with the computer is minimal and simple, but the graphics are nice. Perhaps a younger owner would appreciate this package!

CU*BERT in **TI BASIC** by P Strassen. £6.00

A **TI BASIC** version of the cube hopping varmint. You hop from cube to cube, changing colours and avoiding nasties.

THE WALL: Extended Basic by N. Lawson. £6.00

All you have to do is climb a wall. Simple. Do avoid the creatures moving around though! **MANY** screens with various tactics to be discovered.

SPY'S DEMISE by Mark Sumner.

An arcade game: Pass from side to side of the screen many times, avoiding secret agents.

A code: every time to make one pass, a letter appears, forming a coded message.

A riddle: the message is a riddle for you to solve!

A Competition: First UK solver wins a software prize from the program author!

TWO VERSIONS: BOTH REQUIRE JOYSTICK. State which you require:

FOR MINI MEMORY (Machine code) or EXTENDED BASIC. £8.00 each

FLIP FLAP by R Trueman in **EXTENDED BASIC** £6.00

An original arcade style game. Traverse the squares, changing their colours and avoiding nasties. Different layouts on each screen with bonus points to be earned. Challenging. Joystick required.

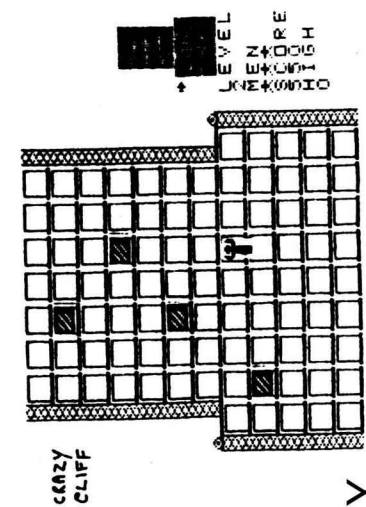
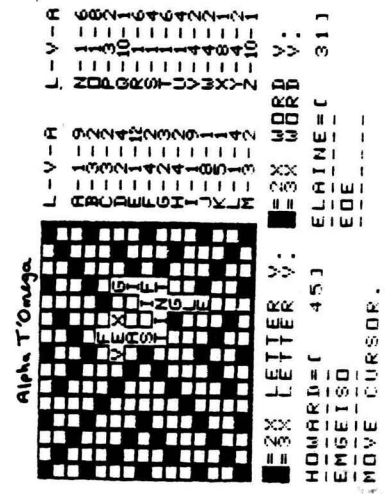
BILLY BALL AT THE HATCHERY in **EXTENDED BASIC** by R Trueman

What could be the start of a series of adventures for a cuddly bouncy little Ball. As the eggs hatch Billy must knock them to the ground to avoid the space monsters attacking him. Eggs are dislodged by jumping up and down on top of them, but there are also some handy hammers around. **JOYSTICK REQUIRED.**

GEM GRABBER in **TI BASIC** by R Trueman. £5.00

Tunnel your way around rocks and explosives to collect gems. You have limited explosive to dig your way around! Several screens.

Prices include VAT and POSTAGE. Also see next page!



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Programs having earned 5 star HCW reviews ***** :

MATH FLASH ASTRONAUT, TI BASIC
from MAPLE LEAF MICROWARE. For 5-10 yrs old
Teaches addition and multiplication of single digits, with a graphic reward. £6.00

WALLABY in EXTENDED BASIC by Mark Sumner
JOYSTICK REQUIRED. Help the wallaby out of the dangerous factory! £7.00

STARPROBE 99 in TI BASIC by Mark Sumner.
A reworking of his CRAZY CAVER, with many more hazards, as you plumb the depths of the alien planet, refuelling and rearming as you go. £7.00

Q*BOND + QUASIMODO, EXTENDED BASIC, £8.00
Joystick required. Q*Bono is that cube hopping creature again! Quasi is a simple implementation of a game now proving popular. A 5 star review, but this program has proven most unpopular with one buyer! Find out what the fuss is about! Do you agree with HCW?

SPECIAL OFFER FOR TI*MES READERS ONLY:
GOBLINS REVENGE in TI BASIC, by PEWTERWARE, *****
Usually £7.00, but for you, until 30.7.84, £6.00
A maze program in which you avoid a Goblin.

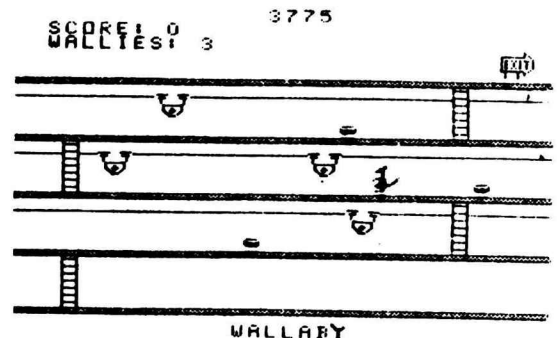
KEYS OF THE CASTLE plus OCTAL-1, EXTENDED BASIC
by PS SOFTWARE (Mark Sumner). One maze type game with many levels, and a shoot em up game. Usually £11.00 but for you, until 30.7.84, only £9.00 ***** review

Other 5 star reviews:
3D Race. TI BASIC. £6.00
SHUTTLE COMMAND. Extended Basic. £12.00
GLOBAL RESCUE. Extended Basic. £7.00
QUICKER QWERTY. TI Basic. £9.00
GOLF. TI Basic. £8.00
WALLS & BRIDGES + ZOMBIE MAMBO. TI Basic.
-3 programs. Joystick Rqd. £19.50
PLANET DESTROYER. TI Basic. £6.00
KONG. TI BASIC. £5.00

Full details in catalogue, see above!

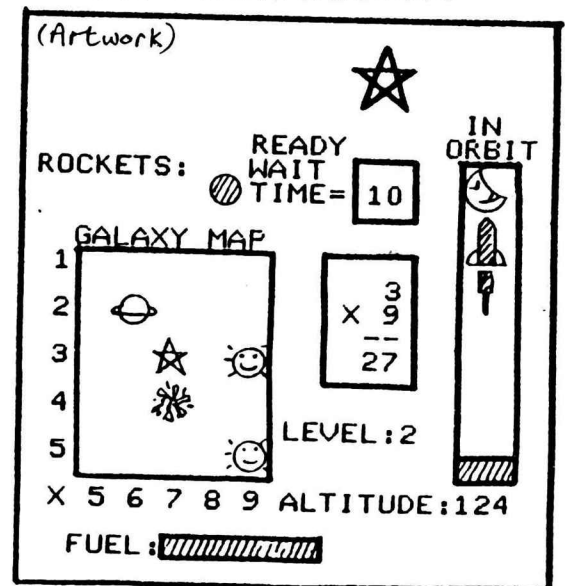
Lots of good 4 star programs too!!!!

STAINLESS SOFTWARE (Proprietor Stephen Shaw)
10 Alstone Road STOCKPORT Cheshire SK4 5AH



ONLY THIS THIRD WAS VISIBLE ON SCREEN

Math Flash Astronaut



Did you ever wonder why TI's modules cost so much, before they started selling them at 'distress prices' ? ... If you know anyone with a DRAGON, ask them what happens if they insert and withdraw modules when the console is switched on... TI did at least believe that self-destructing modules were not 'on'. .. then you can commiserate with your Dragon owner.. last news I have is that Dragon have also failed, adding to the list...

TI, Vectrex, Adam, Dragon, Jupiter, and Lynx said to be in trouble.

Latest name in the list of petitions for winding up is PCS DISTRIBUTION, one of the big five national software distributors. Distributors bought too much stock for Christmas, and were left with a lot of rapidly aging stock. As they also deal on credit, it is entirely possible PCS may drag some software houses with them, that remains to be seen....

Whatever the current crop of opportunists feel, I am sure that present pressures to bring software prices down is merely leading to the quite rapid demise of the industry. The opportunists will of course make a huge fortune, but how many programs can sell in sufficient quantity to merit such prices? Not a lot, and none of your 'minority interest' programs!

Good news though... there are still some new TI suppliers appearing. One of these, Program Factory Ltd., has taken over the programs sold by BAMBI SOFTWARE (although advertising them as 'new' some of the titles were on sale by Bambi over a year ago!). Bambi suffered from a VERY remote location, making mail order rather difficult, and also not sending any programs to HCW for review.

Did you see the July 84 issue of GAMES COMPUTING? Two programs for the TI!!! One by N Lawson, Sir Prancealot, may have had you guessing! If you see the pound symbol (£) in a listing, you should type in the hash symbol instead (that is, the #.). This is because the same ASCII code is used for the pound and the hash on printers. Whichever is printed is set either by a switch in the printer, or by software commands ... which is what I have used (with TI-Writer) to give you those symbols: # & £.

If the person listing a program has his printer set to print £ then it will print £ instead of # symbols (eg in CALL SPRITE(#1....))

I suppose it is a bit lazy not to switch the printer back to # ... although as you may see, it takes me very little effort!!!

And if you liked that program of Neils, watch out for another by him in my advert in this issue (The Wall).

Do you have an interest in commercial software? Adding up all the sales of tapes it seems that some 70% of TI owners have no commercially bought tape software... which could mean a great deal of copying! The lack of sales is already leading to people reducing or removing their software support, so if you do like commercial software, support the producers! (Now, before they give up!). And please, although it is very tempting and easy, don't copy commercial programs for your friends! Thanks.

Incidentally, in addition to queries, I am always happy to receive your thoughts and opinions, or any snippet of information you may have stumbled on, for possible publication in RAMBLES. An SAE if a reply is required please!

My address again, in case you missed it earlier:
10 Alstone Road STOCKPORT Cheshire SK4 5AH (Remember the post code!)

RAMBLES REVIEW TIME

Lots of new products seen or purchased in the last 3 months.

Many of these items are in very short supply, and some will not be available when you read this. For current information, please contact ARCADE HARDWARE and PARCO ELECTRIC. Some items may become available second hand or you may be able to locate sources in the USA.

MBX SYSTEM:

This system promised much for the 4A, and its rapid withdrawal following TI's withdrawal is a considerable tragedy. Its facilities are hardly used in the few modules which have been released.

First the system description, then the modules:

The MBX unit is a large box which connects to the console via the joystick socket AND the cassette port. Other connections are: 9v DC power supply, special joystick, and microphone.

Facilities:

Membrane keyboard on the MBX unit. This is used to control the unit, and in some games, an overlay is used giving various positions certain functions.

Microphone: attached to a comfortable headset unit, this is used for speech recognition, allowing you to direct a program with your hands tied behind your back!

Joystick: Very special joystick: fire button plus 3 control buttons. Analogue joystick...point it in the direction you want to travel: not limited to 8 directions. Also can be used as accelerometer: the faster you move the stick the faster your man moves. Also the 'knob' rotates and can be used to rotate a man or to provide some other input.

NONE of these facilities can be used in Basic or Extended Basic. The Joystick can ONLY be used with the MBX cartridges. None of the cartridges use ALL the MBX facilities.

The MBX console appears to be controlled by the MBX modules, and it may therefore be possible to interface to a machine code program, but with no information available it could be a long job unravelling it.

As a powerful unit, it is not cheap, despite the lack of access. It may perhaps be best considered as a luxury item, to be bought if you have everything else!

The modules:

TERRY TURTLES ADVENTURE, I'M HIDING, BASEBALL: REQUIRE the MBX unit to function. The other 7 modules may be used on a 4A console without the MBX, although the MBX may add certain features.

All ten modules have speech output: the MBX can provide this (output via a loudspeaker in the MBX) or if you do not have the MBX, the Speech Synthesiser may be used.

TERRY TURTLES ADVENTURE: Using Speech Recognition. You tell the Turtle where to go. The aim is to get him home before Winter. Quite easy even with the 3rd (most difficult) screen. For very young owners. Directions include Swim, Eat, Climb, Left, Right, 1, 2, and 3. Suggested for age 4 up.

I'M HIDING: My favorite. Suggested for age 4 to 7, but some 1 year olds could benefit, with supervision. Uses speech recognition. A simple game of hide & seek, with two screen layouts of jars, pencils, crayons, and brushes. A cast of very likeable characters, each with its own voice.

Choose a location (type, colour and size) and receive clues such as 'nearer' or 'farther' or 'very close'. Uses bit map mode graphics and very catchy music. My favorite, and may be worth buying the MBX for! Teaches classification and deduction.

A younger child who may lack voice control can use a keyboard overlay which has pictures on it, to input guesses.

...the voice recognition is remarkably accurate by the way, but can be fooled. You first 'teach' it your voice, then it compares your input to the taught library, and chooses the closest match.

HONEY HUNT and SOUNDTRACK TROLLEY I have not seen. They are described as for ages 5 to 8. The only facility is speech synthesis. Honey Hunt is described as teaching patterning skills (?) while Soundtrack Trolley seems like an interesting variation on the Simon music game.

CHAMPIONSHIP BASEBALL uses many of the MBX facilities. For two players. One player is pitching: he uses the keyboard to input the type of pitch, and the headset to direct his fielders where to throw the ball. The other player as batsman uses the joystick. The rotating top gives bat speed (which governs where the ball is likely to land) while the joystick itself directs the man to run. Baseball is not very well known here, but the module seems faithful to the game.

SPACE BANDITS is a sort of 3D game in which you collect gems and avoid aliens. The form of input is very difficult, and you may prefer the use of a normal joystick to the MBX. Voice recognition is available, but a trifle too slow. There may be a bug in the program, as the man seems to dislike turning one of the corners. A very difficult game to master, and the layout, being original, may appeal to those who like a challenging arcade game. The 3d tunnel is wrap around style, so even if the aliens do not shoot you, you could shoot yourself in the back!!! Different.

SEWERMANIA. May be best suited to younger players, as there is no urgency in the action. You must search a sewer for a hidden bomb, avoiding an alligator and rabid rats. The MBX unit adds speech recognition, which does add to this game. The MBX joystick is also used. The speech recognition allows you to 'store' a command ('door') which will be obeyed when possible.

BIG FOOT: The MBX adds nothing to this game. It is a CLASSIC and very strongly recommended to you. Play testing here shows it has great appeal. Similar to ALPINE, but much better put together. From the mountain top, BIGFOOT throws iceballs at you. Avoid these and collect gold, then climb to the top and cage him. In later screens eagles may carry your ropes away... so far I have made it to screen 6 (all different). Patience has its rewards in this game! Not TOO difficult.

METEOR BELT: The MBX joystick may be found better, but I am happy using an ordinary joystick! For 1 or 2 players, who must shoot down meteors and satellites and each other. There are conflicting tasks: to get a high score, or to destroy your opponent. Playing against the computer, high scores are difficult as the computer can play very aggressively, and once either of you have used up all your ships, its game end! The confusion of tasks does detract a little, I suggest you forget high scores, and play for who has the highest score at the end of each round.

SUPERFLY: Again perhaps for younger players. Features speech recognition, and uses the MBX joystick rotating top. (CAN be used with a 4A alone). Control a fly armed with a deadly laser(?) and control those equally deadly spiders. Quite a simple game. Most players will reach at least screen 7 on first play!

NB: I'm Hiding and Meteor Belt do require a COLOUR tv!!!!!!

Overall, a worthwhile first offering. It is a shame more modules will not be forthcoming to really use the MBX system.

As I mentioned above, I'M HIDING gets my prize for best use of the MBX and best overall offering. BIG FOOT is a very worthwhile module without the MBX.

HERE TO STAY



TEXAS INSTRUMENTS HOME COMPUTER TI-99/4A £89.00

Console: 9900 Family, 16-bit microprocessor, plus 256-byte scratchpad RAM.

Memory: Total combined memory capacity: 110KBytes. Internal ROM memory supplied: 26KBytes. External ROM memory: (Solid State Software command modules) up to 36KBytes each. **RAM memory supplied:** 16KBytes (Expandable to 48KBytes). **Keyboard:** 48 key QWERTY with control and function keys (user definable), full upper and lower case capability, alpha lock, auto repeat.

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BABBLING BROOKS II

Peter Brooks SUMMER 1984

Some of this issue's Babble was also published in TI-LINES which is the newsletter of the Oxfordshire group, OXON TI USERS. To save me retyping large chunks material, Clive (Uncle Clive ?) has kindly agreed to incorporate part two and three of CONTROL AND FUNCTION KEYS.

TI-LINES is not much like a newsletter in the true sense of the word. It has little news to speak of, mostly because the group members are so thinly-spread upon the grounds that it is difficult to hold meetings and therefore there is little to report. Having been allowed by Paul Dicks to be so verbose in Tidings, I found that I was beginning to experience withdrawal symptoms after a few months of not having to write hefty chunks about what I or others had been doing, and these symptoms were aggravated by having to rush to produce 48,000 words in three weeks on a professional word processor, followed by a longish period of digital inactivity (my fingers weren't typing!), so that even writing for a prestigious publication like TI*MES didn't satisfy my need to 'get things off my chest' (quote first attributed to Raquel Welch...).

However, although I enjoy writing (or typing) about whatever happens to be the subject of the moment, I pay for the intellectual pleasure with physical discomfort. Backache, neckache, headache, and eye strain are common payments I make for being loud-mouthed (loud-fingered ?). Until now, that is.

I recently rather rashly decided to expand my system into a full word processor come what may (and one of the things which had better 'come what may' is a royalty cheque for my book's sales, so perhaps that ought to read 'come what July') and bought the TI-Writer module from Gary Harding. I don't yet have a printer, RS232 card, or PES (peripheral expansion system) but do you think I'd let a little thing like that stop me? In the past three days I've pored over the manual and tried all sorts of things - many of which I learned at the keyboard of a professional system - and managed to knock up a 10,000 word article with six tables on the subject of the Speech Synthesizer. If that sounds like I'm being studiously casual, believe me I'm not. It wasn't easy, mainly because old habits die hard and I have this habit of trying to do things which the TI-Writer won't accommodate - like reformatting a carefully-set-out table which has no carriage-returns embedded in it (TI-Writer owners may chortle, non-owners can let their imaginations run wild).

**ED: Printing out this without carriage return was not easy but I cracked it.

Other, more experienced, TI-Writer owners (or Keepers - it tends to behave like an animal at times, eating files when there is a mains spike) have given reviews of its good and bad points, so I won't add my six penn'orth here, except to say that I am slowly learning to look at one screenful of script while holding the other screen and a half in my head - not an easy task for me. (Before anyone leaps forward with suggestions about reducing the tabs settings to give a 40 column typing area, this doesn't help when you're working on a table that occupies 72 columns!).

COMMENTS on TI*MES Number Four.....

Anyway, one of the things I decided to do to add to the article from TI-LINES was a 'post mortem' on the last issue of TI*MES. I don't know about other members, but every issue generates all sorts of ideas, questions, and comments in my excuse for a brain, only like many of you I don't get the chance to air them with anyone - except in the pages of the next issue of TI*MES, that is...

On page 4 of the SPRING issue, Mr V. Comley commented on the single pixel drawing article (I assume that this was the Australian version published in an earlier TI#MES). Since my over-long waffle on the subject in Tidings, V2.1, (Feb'82), the routine has been rewritten several times to enhance its speed and reduce its size, and recently I received a letter from one IAN SWALES who has special skills in going two better on my feeble efforts, and he has managed to work wonders on my original routines. He tells me that he has sent a detailed explanation to Clive for possible publication in this Summer issue (nasty case of month-itis breaking out in this Babble) so it may even exist elsewhere in next issue. Either way, so great an improvement has he made to some of the routines that one, the Low Resolution plotter, now runs as quickly as a single subprogram does in TI BASIC - and that really IS something.

This ought to underline something for those of you who are new to programming: a program is never finished; there is always some improvement or enhancement to be made.

Also on page 4 was a request for information on a MODEM for the TI. I did wonder if ACOUSTIC COUPLER was meant instead, as you don't need permission to connect one of those to the phone (and TI used to market one for the 99s). A modem is hard-wired (as they say) into the phone line, and the GPO's interest (so they claim) lies in the fact that the signals transmitted by the computer through the modem could activate our DEWline (District Early Warning system) and trigger a false Nuclear Attack Alert. It is true that DEWline uses the phone lines but, as a series of articles in PERSONAL COMPUTER WORLD pointed out, it is questionable whether any micro could trigger the system. 'Desperate' Dave Tebutt was the journalist who tried chasing the GPO up to get some hard facts from them (without any real success) but it is interesting that until they needed to approve the TORCH system (for their own use), they had only examined and passed one modem (for use with the PET I believe) in three years...

Page 10's problem concerning the search for the digit '7' in a string could be solved a little faster using POS(); until I can find a quicker method, I swear by the use of POS() and SEG#() when translating from HEX to BINARY and vice versa:

```
H$="0....1....2....3....4....5....6....7....8....9....A....B....C....D....E.... F"
```

```
B$="0000.0001.0010.0011.0100.0101.0110.0111.1000.1001.1010.1011.1100.1101.1110. 1111"
```

To translate the hex digit B into binary, first locate its position in H\$ with POS(H\$,"B",1). That same position in B\$ contains the four binary digits which correspond to hex B, and you can thus isolate them with SEG\$(B\$,POS(H\$,"B",1),4). This approach using string manipulation is very quick and has many uses. If you want to reverse the bit sequence when manipulating graphics, you might include another 'reference' string:

```
R$="0000.1000.0100.1100.0010.1010.0110.1110.0001.1001.0101.1101.0011.1011.0111. 1111"
```

Similarly, you can do the same thing with the hex digits themselves:

```
H$="0123456789ABCDEF"
```

```
R$="084C2A6E195D3B7F"
```

If you want to translate from decimal to hex (perhaps turning an ASCII code into its hexadecimal equivalent), then try this (using V as your decimal value):

```
H=INT(V/16)
```

```
L=V-H
```

```
V$=SEG$(H$,H+1,1)SEG$(H$,L+1,1)
```

where V\$ holds the hex result. This approach can be extended to translate any decimal (integer only) number into hex, or even into binary. (Or octal, or in fact any numbering system).

On page 15 there were two short programs. Could anyone make out why line 185 was used? I couldn't find a READ instruction anywhere which used the DATA... and lines 210 and 215 would never be executed as far as I could see. Or have I missed something important? ** ED: LA99ers can you explain this ??

Without trying to be terribly modest, the shortest Tic-Tac-Toe program published in the UK was less than 256 bytes long and used Artificial Intelligence techniques. The shortest unpublished program was less than 220 bytes long. Both were written for the Casio fx502p, and PCW paid me seventy nicker for the first one...and both are unbeatable...

Page 17 and an answer to Geoff Nunn's query about what part of the LINES routine was doing - initialising the SPRITE DESCRIPTOR TABLE apparently...

Page 22 - good to see Graham Baldwin writing in TI*MES. Most folks may not know it, but Graham and I have been submitting a series of articles on the 99/4A to Home Computing Weekly since about November last year. They may be published shortly.

Page 25 - who is this idiot? ASCII 127 is NOT the start of the UDGs, 128 is.

STOP PRESS: The fool who wrote this article on behalf of DAVE HEWITT left off some information about the 47 uF capacitor. It should be soldered on one end to the inner cable of the video lead going to the video socket, and on the other to the 1 kilohm resistor, taking care not to apply too much heat or the resistor's connection to the circuit board may come away. In addition, there are several different modulators around, and the article did not apply to modification of the type housed in a plastic casing.

Page 31 and Howard Greenberg: thank you for your kind wishes - I'm going to need them in the months ahead! Also, I am a devotee of the lower case l and have been for twenty years (it beats religion any day).

With regard to the line by line assembler, I know of someone who is preparing a direct cassette-to-disk loader, thus enabling we poor MiniMem owners who also have a borrowed disk system to put our masterpieces on disk.

I'm not a competent programmer but you may find some help concerning the basics of the cassette filing system in TI BASIC from MASTERING THE TI-99, a masterpiece by...er...some looney called Brooks...

Page 39: would that more vendors of 99/4A equipment and software had a similar policy; good on yer, Blue.

Page 41: the program offered by Ed York is good enough to be included in my new book: "Teach Yourself To Debug Other People's Examples" (many of my own ought to be in it). If you tried entering and running the routine that begins a loop with FOR A= TO 100 and then ends it with NEXT, well, you'll see what I mean. Also, rounding off numbers has a short cut: to round off to N figures use $10 N$ thus:

```
INT(.5 + A * 10 N)/10 N
```

(where $10 N$ can be calculated beforehand to speed things up, and A holds the value to be rounded).

You could turn it into a DEF function with $DEF RD(A) = INT(.5 + A * 10 N)/10 N$, where N has to be set whenever it changes. For example,

```
N = 3  
PRINT RD(123.45678)
```

The example given for producing random numbers may have caused some problems. Few calculators will evaluate $(-X) Y$ simply because they use their LOGARITHM functions to calculate the answer, not because it can't be calculated. $(-3) 3$ is $-3 * -3 * -3 = -27$.

At the risk of pre-empting one of my own HCW articles, a better method of generating random numbers in the range -10 to +10 is this:

- 1) Add 10 to make it non-negative (0 to 20).
- 2) $\text{INT}(\text{RND} * 21)$ will give you integers in the range 0 to 20.
- 3) Now reverse what you did in (1) - i.e., subtract 10 - and you have $\text{INT}(\text{RND} * 21) - 10$.

One point to notice is the use of RND twice. This is a fairly complex thing to discuss (and was to have been a major article in TIDINGS), but RND produces a 'PSEUDO-RANDOM' number, where certain values are produced more often than others, so it is 'biased' or 'weighted'. To reduce this unequal generation, many pundits suggest using RND twice, but it depends mainly on the technique used to generate the numbers in the first place.

- 1) By checking the numbers of 'frames' of TV display sent to the TV by the computer. This information is contained at an address in memory, and usually yields a value between 0 and 255.
- 2) By calculation using a set of special numbers. Try doing long division of 1 by 997. The resulting fraction has about ~180 digits before the sequence begins repeating. Throw in another variable like that in (1) while slicing the fraction into 3-digit groups, and you might have a slightly better number generator.
- 3) By doing (1) and (2) and also sampling areas of memory which are used to store other information which is constantly changing, and adding the whole lot together.
- 4) By using a set of tables, held in ROM, perhaps in conjunction with any or all of the preceding items.

For example, my Casio fx502p programmable calculator has a RAND function, part of which samples the number currently in the display when calculating its pseudo-random number.

Page 42: At some stage in the not-too-distant future I will try to get round to writing something coherent on Sorting and Searching. I am planning to produce some A5 format booklets over the next few months on various aspects of the TI - mostly because the publishers don't rate the machine any more and I resent that. It may not be the best micro that was ever produced, but it's the only one I've got and I'm not letting almost two thousand pounds worth of electronics sit around idle because of someone's uninformed policy decisions. (That's two thousand at purchase cost - today's prices are a fraction of what they were. My NTSC 99/4 cost me a thousand for the console and TV alone - and that doesn't include the credit charges of about two hundred pounds on top of that.)

STOP PRESS

A contact of mine, ALAN DAVEY, has notified me that he intends setting up what is known as a BULLETIN BOARD. The services which he will try to offer will be determined by the response he gets. You will need a TERMINAL EMULATOR II module and an RS232C interface, as well as some form of MODEM. You will also need to be on the telephone. Alan will use a MINOR MIRACLES modem (which featured in DATABASE, the micro-buffs program, recently) if that helps anyone decide on their equipment, while MICHAEL SAYERS, secretary of the DERBY USER GROUP, is going for the MAPLIN MODEM kit. For the moment, all enquiries are being channelled through me. If there is sufficient response, we have a retailer who is willing to stock modems, and who has generously offered to support this project.

Anyway, that's about it for this Babble. I hope that it comes out alright (I'm writing it using the TI-Writer but without the benefit of a printer to give me hard copy to check. **ED: Peter we are more than grateful for your excellent work it is just fine.

Good luck with your programming, and if you need to, I can be contacted on OXFORD 717985 or by post to 29 Kestrel Crescent, Blackbird Leys, Oxford OX4 5DY.

THE CONTROL AND FUNCTION KEYS

PART II

Peter Brooks

In the first part of this article we looked mainly at ASCII rather than at using the CTRL and FCTN keys, primarily because before you can discuss the keyboard scans and 'active' keys, you need some basic knowledge as background. So far we have glanced briefly at the function of CTRL and FCTN in their roles as control and editing keys, and at their use to obtain TOKENS. The Users Reference Guide (URG) gives a list of almost all the control characters, but you may have been confused by the references to 'Pascal' and 'BASIC' modes, and the two different sets of key codes listed on page 93. Quite why there should be a difference between the two modes is not clear.

A 'mode', in case you were wondering, refers essentially to the way in which the computer has been programmed to respond according to what it happens to be doing. When you are running a program, the computer is in RUN mode and will not respond in quite the same way as it would in IMMEDIATE mode. Immediate mode is the one you get when you select TI BASIC (or Extended BASIC, for example) - it means that the computer will respond 'immediately' to certain commands, rather than storing them away for later execution (i.e., what happens when you enter program lines).

For example, in RUN mode, pressing and holding down FCTN and then pressing 4 will BREAK the program - the computer will then return to the IMMEDIATE mode. However, if you perform the same key presses in Immediate mode, the computer will 'ignore' any instructions which you have just typed (but not ENTERed), and present you with a fresh line ready for another command.

Try this:- get into Immediate mode, making sure that there is no program currently resident - if necessary type NEW and press ENTER - then press and hold down the CTRL key and press these other keys one after another:

the comma (,), the letters A to Z, the full stop (.), the semicolon (;),
the equals (=), and the digits 8 and then 9.

Release the CTRL key and press and hold down the FCTN key and then press 4 to perform the BREAK. The display will scroll up, a fresh 'prompt' will appear (the 'greater than' symbol), and the cursor will indicate that the computer is ready to receive instructions. If you had pressed ENTER instead of BREAK, the response would have been an error tone and the message BAD NAME - i.e., the computer would NOT have ignored what you had typed.

BASIC mode therefore is what you are in when using TI BASIC, and Pascal mode is what you are in when using the UCSD Pascal system which is available for the TI.

Now thoroughly confused, you probably wonder what on Earth all those control characters which you have just entered are supposed to do. Last issue I gave two short, very similar routines to print out on screen all of the User-definable graphics characters (UDGs), and I mentioned that it was possible to use the CTRL key to replace one of the routines, which is what we have now done. You might choose to simplify things and just use CTRL with the alphabet keys (A - Z); the intention is simply to provide a visual indication that any incoming program is being loaded successfully. There is a set of tables later which gives, amongst other things, a list of the ASCII characters 127 to 255 and, where possible, the keys to be pressed to obtain those characters on the screen (in a program listing, for example). In some cases, more than one combination of keys can be pressed - for example to get the character whose code is 133 - and in some instances you may find that your keyboard gives slightly different results: RICHARD BLANDEN tells

me that on his 4A FCTN Q gives ASCII 185 instead of 197, which means that his keyboard is probably decoded differently.

The lists contain more information - for example, the TOKENS, which we will examine a little more closely later - but our interest at the moment centres around the UDGs. Having placed them on the screen with the CTRL key, get a program which you have already recorded on tape, and begin the OLDing sequence (see page 9, last issue), just to see the effect.

Once your program has OLDed successfully, type NEW and press ENTER. The UDGs won't now be on screen: place them there as described earlier with the CTRL key. Note that the 'shapes' are still defined. Most, if not all of them, will be blocks of apparently randomly-scattered dots and lines, but what you are actually looking at is part of your BASIC program. To digress a little (again), when you typed NEW and entered it, the computer DIDN'T remove your BASIC program from memory. What it did do was to alter a 'system variable'. System variables are values referred to, and in use by, the computer as it not only runs your programs but also when in Immediate mode, etc. Somewhere in memory the computer stores details about any resident BASIC program: where it is currently stored, for example. One system variable holds the address in memory where the listing begins, another where it ends. If those two system variables hold the same value (so that the 'listing' begins and ends at the same place) then there is no BASIC program on board as far as the computer is concerned. NEW alters the 'end of listing' variable, and if we had been given access to machine code as standard (PEEK, POKE and USR or similar) we would have been able to 'recover' a program if we had inadvertently NEWed it.

Now, because the UDGs definition area in memory, and the TI BASIC program listing area, begin at roughly the same point, (see last issue) we can 'see', to a limited extent, what a BASIC program 'looks like', by examining the UDGs without redefining them. (Again, had CALL CHARPAT() been included in TI BASIC, we could have obtained the current definition strings for the 'undefined' UDGs, and thus examined part of the BASIC program without using machine code commands. You can try this with MiniMemory, but I doubt if it is possible with either Editor/Assembler or Extended BASIC + 32K RAM Expansion, because they don't make use of VDP RAM in quite the same way.)

For example, take the BASIC instruction OPTION BASE - disregard the 0 or 1 for the moment. When stored in the computer's memory, OPTION and BASE are 'tokenised' - that is, ASCII 158 is placed in memory instead of the full word OPTION, and ASCII 241 in place of BASE. In two consecutive memory locations therefore are the binary equivalents of 158 and 241 decimal. In hexadecimal, 158 is 9E, and 241 is F1. So what? you might say.

Well, try defining a graphics shape to be "9EF1" - you can do it very simply with say CALL CHAR(159, "9EF1") in the Immediate mode, and then use CTRL 9 to place the character whose code is 159 on the screen. The shape you see is OPTION BASE as it appears in memory through our 'window'. Try translating other tokens in the same way, and then go one step further: take a simple phrase like "HELLO MA", work out the ASCII codes for each of the letters and the space, translate them into hex (the text is 8 characters long, and the resulting hex string will be 16 digits long) and then use that with CALL CHAR() to redefine ASCII 159. You should have arrived at "48454C4C4F204041". Put the character on the screen with CTRL 9 to see what 'HELLO MA' will look like when stored internally.

Now, quit, select TI BASIC again, put in this routine, and run it:

```

100 CALL CLEAR
110 DIM T$(128)
120 FOR I=128 TO 159
130 PRINT CHR$(I);
140 NEXT I
150 FOR I=1 TO 128
160 T$(I)="HELLO MA"
170 NEXT I
180 GOTO 150

```

The sequence runs like this:

- 1) Clear all the UDGs of shapes; come back into TI BASIC
- 2) Clear the screen
- 3) Reserve space for a string array which has 129 elements (0 - 128)
- 4) Print out all the UDGs in a continuous string
- 5) Put the text "HELLO MA" into every element of the array
- 6) Go back and do (5) again until BREAK is pressed

If you leave this running for some time, you will notice one or two peculiar things happening; see if you can explain what they are and why they occur (answers next time).

Above all else, you should be able to recognise your 'HELLO MA' pattern appearing over and over again in the UDGs, although it probably won't sit squarely in each character - it may overlap from one character to the next. You'll have to BREAK the program to stop it running. Try different groups of letters to see the shapes that different words or sentences produce.

OK, you say, now what? I still don't see how to use CTRL or FCTN in my own programs.

Well, if you examine the CALL KEY() command in the URG, you'll see that with some keyboard scans the FCTN and CTRL keys are 'active' - they will return a number if you press a combination of either CTRL or FCTN and certain other keys - and in others they are not. If you want to provide some special keys to be pressed, to provide some options for the user, you could use "PRESS 1 FOR this, 2 FOR that," etc., OR, you could use "PRESS CTRL AND 1 FOR this, AND 2 FOR that," etc.

Because the TI use of CTRL characters is non-standard, they will not have the same power as on other systems, but they can be used to extend your range of keys for use as menu options.

However, it must be said that it is probably simpler and easier NOT to use CTRL or FCTN in this way - in menus, you are unlikely to need to use more than the keys A - Z and 0 - 9 for any program that you could write for the 99s.

Where CTRL does have a use is in listings. Instead of using the laborious (and space-consuming) CHR\$() function (with or without loops) to manipulate the UDGs, you could employ the characters directly: for example, instead of:-

```
PRINT CHR$(128);CHR$(129);CHR$(130) : CHR$(131);CHR$(132);CHR$(133) :
CHR$(134);CHR$(135);CHR$(136) : : :
```

You COULD shorten it to:-

```
FOR I = 128 TO 134 STEP 3
PRINT CHR$(I);CHR$(I+1);CHR$(I+2)
NEXT I
PRINT : :
```

But better to use:-

```
PRINT "CTRL , CTRL A CTRL B": "CTRL C CTRL D CTRL E": "CTRL F CTRL G CTRL H" : :
```

where, obviously, you don't type C-T-R-L in full, you press and hold down the CTRL key and then press the key for the letter or punctuation mark shown. Don't forget to make a note somewhere of the keys that you have used, and in what sequence, for reference (although you can edit any such line and replace "PRINT" with "A\$=", and then encompass the following PRINT statement with quotes. You can then run a loop of 1 to LEN(A\$), and PRINT out the ASCII codes - ASC(SEG\$(A\$, loop, 1)); which will show you which characters are 'hidden' in the listing. Next issue we'll use this technique to uncover some interesting things.)

Note that after the first RUNNING of any program containing the UDGs directly in listings, they will 'appear' in their redefined form in the listing. Remember this when producing hard copy on any printer capable of reproducing the listing exactly.

We now come to a more detailed examination of the tables of tokens. I have arranged them by ASCII code and by alphabetical key word. It might be useful here to stop and point out the difference between key words and Reserved words. A key word seems to be, universally, the BASIC word which is replaced by a token when listings are entered ('tokenisation'). A Reserved word is one which has been reserved for the computer's use and the user cannot employ them as variable names. In this respect, LIST, RUN, CON(TINUE) etc., are Reserved words but not tokens, while LET, IF, PRINT, etc., are both key words AND Reserved words. (Just as you cannot have 100 RUN in TI BASIC, you also cannot have 150 CON = 3000 or 1000 FOR IF = THEN TO ELSE STEP GO....1100 NEXT IF!). The URG lists the Reserved words, and in the tables here the key words are given. Notice that there are even tokens for +, -, /, &, (,), etc., and that some key codes are 'unused'. Under certain circumstances, if placed in a listing these will produce gobbledegook in TI BASIC; some DO have a use in Extended BASIC (see Stephen Shaw's list in Tidings) and others have some function but at the moment we know the function and not the language!

Some of them are UPRC\$, DAT\$, etc., (related to me by Richard Blanden) and I have seen these before in a TI 990 manual. This tends to support the belief that the 99/4 and /4A are cut-down versions of full-blown mini-computers, complete with mini-computer operating systems. (For example, in the FILE PROCESSING commands, the file description PERMANENT is given, suggesting that there is possibly also a TEMPORARY description. The URG says that PERMANENT may be omitted as all 99 files can be considered permanent - if that is the case, why have PERMANENT at all? Because the mini-computer operating system from which the 4 and 4A system is derived uses PERMANENT and TEMPORARY?..)

The use of CTRL and FCTN to obtain these tokens is of little real practical help when programming, but it is a tool with which to dig a little deeper into the 99/4A (but not unfortunately the 99/4, which has no CTRL or FCTN keys), without needing to expand it.

Although we will have articles later for those possessing MiniMemory and the like, this initial foray is for those who have just the console and who want to play detective (my favourite past-time bar none!).

In the table of tokens by ASCII code, you'll see that after ASCII 198 there are tokens but no key-strokes. There is also a block between ASCII 160 and 175 which also cannot be accessed directly from the keyboard. (If YOU find anything different, please let us all know.).

In the next issue of TI-LINES we'll look at ways of accessing these 'indirectly' - some initial details are given in the tables - and hopefully play around with the effects of editing lines, and discover the devastating effect of ASCII code 0.

Now for some fun. Clear any program from your computer, type:

```
1REM
```

(note: no spaces) and then press and hold down the CTRL key, and press U and keep it pressed to bring the auto-repeat into play. When you reach the end of the 4th line, where the cursor will stop and the machine will make rude beeping noises, press CTRL A and then ENTER. CTRL A gives 'ELSE' which will serve as our 'end of listing' marker.

We now have a TI BASIC statement which is 4 lines long - or do we? CTRL U is the token for RANDOMIZE, and we have around 107 of them, so LIST and watch the longest TI BASIC line you'll ever see. (Well, almost: 'SEQUENTIAL' is one letter longer, but we can't get the token for it directly from the keyboard).

This is where life gets complicated. Type EDIT 1 and press ENTER. Eventually the screen will stop scrolling and the last word on screen will be ELSE, but where is the cursor? (§64000 question). Answer: sitting over the 'R' in 'REM'. Where is that? (§128000 question). Answer: I don't know, but try using FCTN D to move along the line (wherever it may be) and watch the screen scroll up one line for every character sideways that you move the cursor. Bring the auto-repeat into play and be prepared for an all-time-great crash (not audible). The psychedelic flashing, flickering colours and shapes you see are caused by the computer being forced to clog-dance through its own work area, upsetting the colours, 'patterns', even the Sprite descriptors. To get back to normality, exit from your 'editing' with FCTN 4 (BREAK) and then type RUN and ENTER. If all goes well, your normal screen colour should return and the shapes on screen (if they have been visible!) should resolve into normal letters etc.

I suspect that there may be a use for this. (You may suspect that I have a screw loose. I suspect that you may be right...)

If you possess a spirit of adventure, play around with this some more and let us all know what you find!

M I C R O T I P S

Although the manual doesn't tell you so, the keys R, C, and E are 'active' when you OLD and SAVE to cassette. You can, for example, type SAVE CS1 and press ENTER, and then press C, and the computer will act as if you have already been through the full SAVE sequence and now want to check the program which has just been SAVED. This has the advantage that you can check a program which you already have on cassette and compare it with the program which you have onboard to see if they are the same (perhaps to try and avoid making duplicate copies of an amended program). On the other hand, you may have wanted to SAVE the program but been called away to deal with a major catastrophe (the dog's been sick in the washing machine, your eldest has just taken the ears off the guinea pig with the Flymo, and the cat from next door has just dug up the gerbil you carefully laid to rest last week. And the week before. And the week before that...) in which case you can press E and exit, just as if you had encountered an error and decided not to pursue matters further.

This is one of those tips which can be of immense use to some owners and of no use whatsoever to others. I've always found it very useful: I have this habit of not checking a program with C having SAVED it, and this enables me to check it later when I suddenly feel uncertain about the reliability of my cassette recorder. In addition I occasionally use CS2 to SAVE programs (usually because I've either gone and typed the wrong instruction without checking what I was doing, or because I've had trouble with my CS1 RECORD lead), and to check it I then change the leads round (well organised, you see), type SAVE CS1, press ENTER, and then press C, which allows me to check the program.

Editor's note: There have been no entries for the Bulletin board and no response to Gary Harding's request for assistance. If any member feels that they could be of some help, please don't hesitate to get in touch with me.

 TOKENS IN TI BASIC : KEYBOARD - DIRECT : AFTER STEPHEN SHAW TIDINGS V2.3 1982

<u>ASC</u>	<u>STROKE</u>	<u>FUNCTION</u>	<u>ALTERNATIVE</u>	<u>ASC</u>	<u>STROKE</u>	<u>FUNCTION</u>	<u>ALTERNATIVE</u>
127	FCTN V	Unused (DEL)		164		Unused	
128	CTRL ,	Unused		165		Unused	
129	CTRL A	ELSE		166		Unused	
130	CTRL B	Unused		167		Unused	
131	CTRL C	Unused		168		Unused	
132	CTRL D	IF		169		Unused	
133	CTRL E	GO	CTRL Shift D	170		Unused	
134	CTRL F	GOTO		171		Unused	
135	CTRL G	GOSUB		172		Unused	
136	CTRL H	RETURN		173		Unused	
137	CTRL I	DEF		174		Unused	
138	CTRL J	DIM		175		Unused	
139	CTRL K	END		176	CTRL O	THEN	
140	CTRL L	FOR		177	CTRL 1	TO	
141	CTRL M	LET		178	CTRL 2	STEP	
142	CTRL N	BREAK		179	CTRL 3	,	
143	CTRL O	UNBREAK		180	CTRL 4	;	
144	CTRL P	TRACE		181	CTRL 5	:	
145	CTRL Q	UNTRACE	CTRL Shift A	182	CTRL 6)	
146	CTRL R	INPUT	CTRL Shift F	183	CTRL 7	(
147	CTRL S	DATA		184	FCTN ,	&	
148	CTRL T	RESTORE	CTRL Shift G	185	FCTN .	Unused	
149	CTRL U	RANDOMIZE		186	FCTN /	Unused	
150	CTRL V	NEXT		187	CTRL /	Unused	
151	CTRL W	READ	CTRL Shift S	188	FCTN O	Unused	FCTN)
152	CTRL X	STOP		189	FCTN ;	Unused	
153	CTRL Y	DELETE		190	FCTN B	=	
154	CTRL Z	REM		191	FCTN H	<	
155	CTRL .	ON		192	FCTN J	>	
156	CTRL ;	PRINT		193	FCTN K	+	
157	CTRL =	CALL		194	FCTN L	-	
158	CTRL 8	OPTION		195	FCTN M	*	
159	CTRL 9	OPEN		196	FCTN N	/	
160		CLOSE		197	FCTN Q	^	
161		SUB		198	FCTN Y	Unused	
162		DISPLAY		199		Quoted string	
163		Unused		200		Unquoted string	

<u>ASC</u>	<u>STROKE</u>	<u>FUNCTION</u>	<u>ALTERNATIVE</u>	<u>ASC</u>	<u>STROKE</u>	<u>FUNCTION</u>	<u>ALTERNATIVE</u>
201		Line number		228		Unused	
202		EOF		229		Unused	
203		ABS		230		Unused	
204		ATN		231		Unused	
205		COS		232		Unused	
206		EXP		233		Unused	
207		INT		234		Unused	
208		LOG		235		Unused	
209		SGN		236		Unused	
210		SIN		237		Unused	
211		SQR		238		Unused	
212		TAN		239		Unused	
213		LEN		240		Unused	
214		CHR\$		241		BASE	
215		RND		242		Unused	
216		SEG\$		243		VARIABLE	
217		POS		244		RELATIVE	
218		VAL		245		INTERNAL	
219		STR\$		246		SEQUENTIAL	
220		ASC		247		OUTPUT	
221		Unused		248		UPDATE	
222		REC		249		APPEND	
223		Unused		250		FIXED	
224		Unused		251		PERMANENT	
225		Unused		252		TAB	
226		Unused		253		#	
227		Unused		254		Unused	
				255		Unused	

Using the CTRL (Control) key, all the User-definable characters may be brought directly onto the screen (and into listings) through the keyboard, rather than by using CHR\$() as is necessary on the TI-99/4. During cassette OLDing in TI BASIC, incoming program data is transferred into the same area of memory used to contain definitions of any User-defined characters which may subsequently be used. This explains the appearance of 'pre-defined' shapes reported by some users when pressing either CTRL or FCTN and other keys.

 TOKENS : BY RESERVED WORD / SYMBOL

<u>TOKEN</u>	<u>CODE</u>	<u>KEYSTROKE(S)</u>	<u>TOKEN</u>	<u>CODE</u>	<u>KEYSTROKE(S)</u>
ABS	203		OPEN	159	^c 9
APPEND	249		OPTION	158	^c 8
ASC	220		OUTPUT	247	(^f /)
ATN	204		PERMANENT	251	(^c /)
BASE	241		POS	217	
BREAK	142	^c N	PRINT	156	^c ;
CALL	157	^c =	RANDOMIZE	149	^c U
CHR §	214		READ	151	^c W , ^c shift S
CLOSE	160		REC	222	
COS	205		RELATIVE	244	
DATA	147	^c S	REM	154	^c Z
DEF	137	^c I	RESTORE	148	^c T , ^c shift G
DELETE	153	^c Y	RETURN	136	^c H
DIM	138	^c J	RND	215	
DISPLAY	162		SEG §	216	
ELSE	129	^c A	SEQUENTIAL	246	
END	139	^c K	SGN	209	
EOF	202		SIN	210	(^f /)
EXP	206	(^f /)	SQR	211	
FIXED	250		STEP	178	^c 2
FOR	140	^c L	STOP	152	^c X
GO	133	^c E , ^c shift D	STR §	219	
GOSUB	135	^c G	SUB	161	
GOTO	134	^c F	TAB	252	
IF	132	^c D	TAN	212	
INPUT	146	^c R , ^c shift F	THEN	176	^c 0 (zero)
INT	207		TO	177	^c 1
INTERNAL	245	(^c /)	TRACE	144	^c P
LEN	213		UNBREAK	143	^c 0
LET	141	^c M	UNTRACE	145	^c Q , ^c shift A
LOG	208		UPDATE	248	
NEXT	150	^c V	VAL	218	(^c C)
ON	155	^c .	VARIABLE	243	

CTRL = ^c FCTN = ^f Indirect = () string symbol = §

<u>TOKEN</u>	<u>CODE</u>	<u>KEYSTROKE(S)</u>	<u>TOKEN</u>	<u>CODE</u>	<u>KEYSTROKE(S)</u>
QUOTED STRING	199	(^c C)	&	184	f ^f ,
UNQUOTED STRING	200	(^f Y)	=	190	f ^f B
LINE NUMBER	201	(^c B)	<	191	f ^f H
#	253	(^c /)	>	192	f ^f J
,	179	c ^c 3	+	193	f ^f K
;	180	c ^c 4	-	194	f ^f L
:	181	c ^c 5	*	195	f ^f M
)	182	c ^c 6	/	196	f ^f N
(183	c ^c 7	^	197	f ^f Q

CTRL = ^c FCTN = ^f Indirect = () string symbol = \$

CONTROL/FUNCTION KEYCODES : "UNUSED" RESULTANT SEQUENCES (TI BASIC) : PROGRAM

NEW

```
100 REM A$ = "insert single ctrl/fctn character here"
110 FOR L = 1 TO LEN(A$)
120 PRINT ASC(SEG$(A$, L, 1));
130 NEXT L
```

EDIT 100

```
100 delete 'REM' to give A$ = "sequence"
```

RUN

Printout of ASCII codes of sequence occurs

In some instances, 'unused' control/function characters have a use in Extended BASIC, and there may well be additional language modules which employ further 'unused' codes.

 CONTROL/FUNCTION KEYCODES : "UNUSED" RESULTANT SEQUENCES (TI BASIC) : CODE LIST

ASC KEYSTROKES AND SEQUENCES AFTER EDITING

187 CTRL /
 197 62 181 251 182 55 253 254 183 255 87 223 135 121 255 245 79 126

131 CTRL C
 32 175 218 128 136 32 77 150 143 68 109 150 199 32 2 245 77 32

130 CTRL B
 32 86 108 147 32 6 40 44 109 163 6 40 60 201 32 42 86 113 6
 40 62 86 32

128 CTRL ,
 32 214 176 42 128 106 81 145 42 190 176 42 32

188 FCTN 0 (zero)
 228 191 224 1 32 169 174 163 32 0 4

198 FCTN Y
 82 148 200 75 67 114 148 6 45 153 32 100 140 75 140 74

186 FCTN /
 54 191 163 226 245 63 6 55 127 210 74 118 247 92 179 94 183 160 206
 191 118 177

189 FCTN ;
 75 156 163 97 0 4 197 97 42 75 164

185 FCTN .
 232 178 128 136 247 6 48 185 182 6 48

Code sequences arising from the editing of indirectly-obtained sequences to single characters (keyboard-indirect also) have not yet been investigated, but it seems very likely that ALL 256 characters can be brought into listings, thus avoiding the use of CHR\$() and saving space.

 THE CONTROL AND FUNCTION KEYS

PART III

Peter Brooks

Before launching into the third (and possibly final) part of this long and rambling episode on the Control and Function keys (mostly Control, you'll probably have noticed) I need to clear up some unanswered questions from the last article.

If you entered and ran the program given on page 9 of V1.2 TI-LINES and left it running long enough, you should have observed two things (or possibly three - it depends on how long you ran the program). When the program begins running, the first thing that you should notice is the small shapes in the bottom left-hand corner of the screen. The rightmost shape will be changing shape pretty rapidly, and occasionally the whole group may flicker. The second thing which should soon make itself known is a sudden streak of 'insects' which begins at the bottom right hand corner of the screen and shoots across to the left. The third effect only appears after several more seconds, when the flickering shape at the left ceases moving for a few moments - there may also be a small 'ripple' through the line of insects, causing them to advance towards the left. This pausing occurs every minute or so, but the rippling effect may cease.

So what are they? The first effect is caused by the computer 'working' on your program. Remember that I said that the User-definable Graphics (UDGs) occupied the same area of memory as the computer used while working? The shape-changing is due to the UDGs acting as a window on the execution of the loop in lines 150 - 170. In effect, the computer is counting while we watch.

The second effect, the streak of insects, is a little more difficult to explain - mostly because of a lack of detailed information on the processes used by the 99/4A when storing data. When a program instructs the computer to store data in a variable (whether numeric or string doesn't really matter), the computer locates an area in memory which is not being used and stores the data there. It keeps a record of where it has got to as far as storage space goes, so that when the program instructs the computer to store something else, the computer then locates the next free area to store it in. In the program we are using, the computer is instructed to store the same data over and over again. Once it has finished filling the T~~X~~() array, it has to start all over again, but being stupid (as all computers are) it doesn't use the areas which it has finished with, it keeps on using fresh areas until it runs out of memory.

What happens then is the third effect, called GARBAGE COLLECTION (you'll find a large number of terms in Computing which relate to domestic activities - another is HOUSEKEEPING). This is what occurs when the computer pauses. It is 'clearing out' if you like, all the data which is not currently required. This probably involves resetting the internal record of where free areas of memory are located, rather than by actually removing the data. Considering the speed at which computers work when not coping with programs in BASIC, the 99/4A seems to spend rather longer doing its household chores than one might expect.

On top of all this, (as if it wasn't enough), the 'HELLO MA' shape which you see appearing in the UDGs is likely to be in transit - in the process of being stored temporarily in a work area or a 'buffer' (a kind of reception area or waiting room, if that helps you to picture it) - rather than actually being in its final position.

Right, that's got that out of the way, on with the business of the day. So far we have limited our discussion to those tokens which are available directly from the keyboard. However, it is possible to obtain some (if not all) tokens (and therefore characters) using an 'indirect' method.

Before entering into a detailed discussion of the technique and its use as a research tool, let us look briefly at the EDIT mode in TI BASIC. This mode is entered when you type EDIT and a line number followed by ENTER (or FCTN X or FCTN E), or when you type the line number followed by FCTN X or FCTN E. When you do this, the numbered statement (if it exists) is presented on the screen in its entirety - including the line number - and the cursor sits over the first character in the statement. (In Extended BASIC, it is possible to place the cursor over the first digit in the line number using a little trick with FCTN 8 - REDO - and edit the line number as well).

If you then press ENTER or FCTN X or FCTN E without having previously pressed any other keys (or almost any other), the existing copy of the line currently held in memory is left unaltered, but more importantly, no check is made of the line you are 'entering'. If you do type something - even simply overtyping a single letter - the computer reacts as if you were entering the line for the first time. Similarly, if you change a line, then decide to leave it as it is, unless you use FCTN 4 and BREAK out of the editing the computer will examine the line when you enter it, and this can be a very, very slow process in a large program.

This re-examination can be demonstrated easily using tokens. Last issue I offered a quirk for general investigation. It involved entering a REMARK consisting of a large number of CTRL Us to obtain a very long statement. This time, produce a REM containing only 20 CTRL Us and enter it. Call it up for editing with (say) FCTN X, and press ENTER (or FCTN X or FCTN E - all three act like ENTER except under certain circumstances).

Nothing devastating happens. Call it up again, and this time, with the cursor positioned over the R in 'REM', type R again. Note that you haven't changed the line - just retyped a single letter. Press ENTER now, and bang! LINE TOO LONG appears.

Now create another REM, this time containing a single CTRL /. Enter it and then call it up for editing. Note that there seem to be far more characters than you originally entered. (See TI-LINES V1.2, page (v)). With the cursor over the R in 'REM', type R (to con the computer into scanning the line again) and press ENTER. Call the line up for editing yet again, and once more the statement will have changed. Why should this be ?

If you examine the tables in V1.2, pages (i) to (v), you'll notice that certain key codes have 'UNUSED' written next to them. These are codes for which there is no token assigned. The computer, however, still attempts to find a token, and as the token words (LET, PRINT, etc.) are probably related to the token codes (141, 156) and their location in memory, it finds 'garbage' and prints that. Page (v) shows the codes of the garbage for those unused codes which are accessible directly from the keyboard. CTRL / gives a sequence of characters whose codes are 197, 62, 181, ... 126. This is what you saw at the first editing. When you typed R, you caused the computer to scan this sequence, and subsequently when you called the 'new' line up for editing, the computer replaced those tokens (codes greater than ASCII 127) with, in some cases words or symbols, in others, further garbage.

Looking at the sequence for CTRL / on page (v) and the lists of tokens on pages (i) to (ii):

197 : ^	62 : >	181 : :	251 : PERMANENT
182 :)	55 : 7	253 : #	254 : Unused
183 : (255 : Unused	87 : W	223 : Unused
135 : GOSUB	121 : y	255 : Unused	245 : INTERNAL
79 : 0	126 : ~		

A small number of the characters here are not obtainable directly from the keyboard: 223, 245, 251, 253, 254, and they in turn will produce sequences, possibly also containing codes not directly obtainable from the keyboard. I have yet to tabulate

these secondary (and tertiary, quaternary, etc....) codes - perhaps readers might like to compile their own tables and submit them to me, and any important differences will be published in a later TI-LINES.

At this point you might be saying to yourselves - So what ? None of these characters can be redefined by us using TI BASIC, so why bother ?

There are two reasons. The first is universal: because it can be done. Experiment for all you are worth and you'll always end up knowing more than when you started. The second is because you now have a valuable research tool. You can place special codes in listings, which TI never intended you to do, and this has two consequences. Firstly, you can 'embed', or hide, special characters in your program listings which can be of immense help if you ever have a dispute over illicit copying (piracy). This involves ASCII code 0, and the technique for using it is discussed later. Secondly, you can now begin looking for undocumented subprograms (an article later this year will begin to look at this intriguing area of research).

For example, the PERSONAL RECORD KEEPING and STATISTICS modules possess CALLs A, D, G, H, L, P, and S. There is nothing too remarkable about that - the CALLs are well documented now, if not widely known. (They form the basis of Enhanced BASIC, on which subject there will be a series of articles starting soon). However, RICHARD BLANDEN of Wokingham has informed me that, using machine code access through other equipment, he has uncovered more subprograms on those two modules. Using this new research tool in TI BASIC without the need for additional equipment, we can begin to investigate matters for ourselves.

How, though, can we isolate the characters we want from a REM statement ? Page (iv), TI-LINES V1.2 shows one way of doing it. You can either edit a REM statement to fit your purpose:

```
Enter: 100 REM CTRL /
```

Call it up for editing and change REM to A\$=" and then run the cursor as far right as it will go and then add a trailing " to give:

```
100 A$ = " see the list on the previous page "
```

or you can make the REM contain everything you'll need:

```
Enter: 100 REM A$ = "CTRL /"
```

You edit line 100 and delete the letters R-E-M and then enter the new line.

If you type in the program on page (iv) of issue V1.2 you can then place any single CTRL character between the quotation marks in line 100, edit the line, deleting the REM, then enter it and then RUN. You'll get a printout of the ASCII codes of the characters which make up the garbage.

When however you need to isolate a single character, you must carefully delete those characters which lie either side of the one you want until you are left with just that character within the quotes.

Try and obtain character code 254 on its own from the sequence produced by CTRL /. You need to edit to get the garbage between the quotes. Then delete the 'REM' letters, skip over the first quotation mark and carefully delete 7 characters. Move the cursor one position to the right using FCTN D and continue deleting up until the right hand quotation mark. Press ENTER and then RUN the program. If you don't get 254 printed on screen, you've slipped up somewhere. You will not be able to re-edit the line, because whatever is now within the quotes may be replaced by tokens when you try to LIST or EDIT. You will have to set up the line afresh and go through the process all over again.

We come finally to CHR\$(0) and its special properties. As far as the INTERPRETER

is concerned, CHR\$(0) is what it uses to signify the end of text in a REM statement (an end of text marker). The Interpreter is the built-in program which runs your BASIC programs.

When you put a CHR\$(0) in a REM statement, the interpreter thinks that it has found one of its own end of text markers, so any text which appears after the CHR\$(0) will not be listed. It will still exist in memory, though, and will be saved to disk, cassette, or other storage medium - for example, the MiniMemory module. You can therefore place copyright notices and other data in a REM which cannot be seen but which can be recovered through the use of PEEKing with MiniMemory or through PEEK and Extended BASIC, or even through Editor/Assembler. It won't appear in any listings either.

There is one drawback (or possibly two). Firstly, if a copy of your program is made using either direct tape-to-tape copying, or by loading and then saving to a copy tape, your hidden ("embedded") copyright notice will be transferred. However, if the pirate makes a listing of your work and then enters that at his own keyboard, obviously no copyright information pertaining to you is going to be added.

The second possibility is that your program might be edited before being copied. Bearing in mind the technique that we have been investigating, where we make use of the fact that editing a line causes it to be re-scanned, you can see that all an illicit copier has to do to inactivate any copyright information which may have been hidden is to edit every REM line in the program. All that has to be done is for any REM line to be called up for editing and 'R' to be pressed in order to bypass any embedded text.

The program listing below has had two pieces of text embedded in it. Its purpose is simply to 'look at itself' and print out what it finds on the thermal printer. Due to the tokenisation process, much of the printout is nonsense, but you can see quite plainly what the embedded material is.

It has been rumoured that at least one UK software firm has had its programs pirated; perhaps the use of CHR\$(0) in future might make life a little less difficult for those trying to protect their property from thieves.

```

100 OPEN #1:"TP.U.E",OUTPUT
110 REM  EXAMPLE PROGRAM
120 REM  COPYRIGHT PGQB 1984
130 REM
140 REM
150 REM  PRINTOUT OF PROGRAM TO
THERMAL PRINTER
160 REM
170 REM
180 FOR L=16060 TO 16383
190 CALL PEEKV(L,B)
200 PRINT #1:CHR$(B);
210 NEXT L
220 CLOSE #1
230 REM
240 REM

```

→

```

?i' ?p ?t ? I>_ "? I?I ?
?( #?_ x?_ n?_ d?_|| L 7716060777
16383 $<< EMBED OBTAINED THROU
H FCTN 0 8 EMBEDDED COPYRIG
HT NOTICE NOT VISIBLE IN LISTING
S I I &E 7.1 | L 7.1' _
B I 77PEEKV_L_B I * PRINTO
UT OF PROGRAM TO THERMAL PRINTER
I COPYRIGHT PGQB 1984 ||
EXAMPLE PROGRAM || 7.1' _&TP.U.
E--

```

The CHR\$(0) was obtained using the editing technique we have been examining, through FCTN 0 (zero) - see page (v), V1.2 TI-LINES - where the unwanted characters were deleted to leave CHR\$(0) and then the text was added following that character. Alternatively, FCTN ; could have been used - it too provides CHR\$(0) on editing.

Enjoy your programming,

Pete Brock

MANCHESTER MUSINGS

In my recent enthusiasm for all things TI-99/4A, I've now got a system complete with speech synthesizer, joysticks, expansion box, 32K RAM, disk controller and one disk. When I plugged it all together I got some very strange happenings! The disk controller seemed to pack up almost immediately, and the program listings in Extended BASIC coming out of the 32K RAM had to be seen to be believed! I had a real problem because, though you should be able to take the stuff back to your dealer, each part, just about, came from a different dealer (like I said - hardware's not easy to get hold of!). In desperation I rang the "official" TI User Group and (credit where credit's due) they gave me a number to ring in TI at Bedford to answer my question, "What do I do now?!!" Actually, they gave me the wrong number, but I eventually got through to the person they'd told me of in the TI Technical Department, who put me straight on to one of their Home Computer repair technicians. When I'd described the problems, the diagnosis was a bit worrying: "It could be the memory, or the expansion box, or the computer, or!". The answer seemed to be to pack the whole lot up, modules and all, and send it off to Bedford - from where it returned in just over a week (I was never in when Securicor called!) with the 32K RAM card and the disk controller card replaced! I tell this story just to encourage other TI-99/4A owners that TI really is honouring its warranty pledge.

After Stephen Shaw's recommendation of the International 99/4 User Group (IUG) in previous issues of TI*MES, I decided to join. Being a plastic money fan (well, I've not too much of the real stuff!) I thought I'd ring them up and join with my VISA card. I tried the number given in Casciato and Horsfall's "The TI-99/4A User's Guide" and had an interesting conversation with a computer (try it for yourself!), which eventually told me I ought to ring the new number, which is 010-1-405-948-1023. It's very convenient to ring in the evenings because Bethany, Oklahoma time is 6 hours behind us in England. You can pay your membership fee with VISA as well as paying for hardware and software.

The March issue of the IUG "Enthusiast'99" has a fascinating article on Bit Map Mode and (I could hardly believe my luck) when I'd typed in their sample program to draw a line across the screen, using the disk Editor/Assembler, it did!

There's one little problem I have at the moment: no RS232 interface card and no printer. I've solved this problem temporarily by writing a program on a BBC Model B at work, which does have a couple of printers, to read Texas disks! Decoding the Texas disk format by looking through hex listings of sectors reminded me of my first ever programming job. (I was given a 10,000 line assembler program with one comment in it, which said: "JUMP IF DRUM BUSY", and was told: "We haven't got a drum, change the program to work with a disk!!!"). However, I can now LIST programs to disk on the TI-99/4A as well as produce data files, and then get printed listings of them. I can't imagine there are many TI-99/4A owners in a similar situation, but if there are, I'm quite happy to let them have a copy of the BBC program (for a small handling cost). Incidentally, the BBC program also duplicates Texas disks a track at a time using two drives, which is infinitely faster than disk copying on my single disk TI system (but it only works with some 40-track BBC drives and controllers).

Well, I've gone on far too long, so I'd better stop. Just one last word: after Howard Greenberg's rave review of TI-WRITER in the last issue of TI*MES I went out and bought it. Everything he said was true!

Best wishes,

John Rice

John Rice

P.S. I've just worked out how to send TI-WRITER formatted output files to disk and then list them from a BBC onto an Anadex DP9500 dot matrix printer and Olivetti DY250 (Qume code compatible) daisywheel printer (like this!).

by JOHN RICE, SWINTON, MANCHESTER.

First let's look at three general guide books to the TI-99/4A:

1. "Programmer's Reference Guide to the TI-99/4A"

C.Regena (COMPUTE! Publications Inc) £14.95

This 350-page book is worth its weight in gold! It assumes you've read your "User's Reference Guide", and explains all the features of BASIC, with nearly 50 program listings covering "serious" uses for the whole family. My nieces (3 and 5) didn't want to stop singing along with the illustrated version of "Hey, diddle, diddle"! Anyone who's read Cheryl Regena's excellent column in COMPUTE! (£2.25 a month) will know what to expect.

2. "How to Feel at Home with a Home Computer" (Texas Instruments) £12.95

Let's get it straight, this isn't about any home computer - it's about the TI-99/4A! And not just any TI-99/4A. "All you need to do is unpack the parts, connect them together, and plug them into a standard 120 volt AC wall outlet". Yes, it's about the U.S. model - which, you will be annoyed to discover, has a switch on its RF modulator so you don't have to constantly re-plug it into the aerial socket on your TV! The format of the book is excellent, but don't believe all you read. You can use the speech synthesizer with modules other than the Speech Editor (such as Extended BASIC and Terminal Emulator II). There's a useful appendix of "available software", including a number of modules only recently released such as the "10 Milton Bradley Voice Command Video Games : where you use your voice to give various commands to the games"(nice to see that Howard Greenberg at Arcade Hardware is importing the voice recognition hardware and modules). If you take the sales pitch with a pinch of salt, and you want a really well-presented simple introduction to what your TI-99/4A can do for you, you'll find this book quite useful.

3. "The TI-99/4A User's Guide"

C.A.Casciato and D.J.Horsfall (Howard W. Sams Inc) £9.85

I laughed till I cried! If you want a really laid-back, jokey, all-American intro to the TI-99/4A - this is it, man! It does actually provide a very reasonable summary of what the machine is, what you can add to it, and what you can do with it; but at the price, it's really worse value than the new TI book. Almost a "no-no", I think.

Now for two games books:

1. "Entertainment Games in TI BASIC and Extended BASIC"

Khoa and Quyen Tan (Howard Sams) £8.05

As a professional computer scientist I raise my hat (and my glass!) to the pair of US high school kids who wrote this excellent book. And the publisher must take a bow for superb layout and presentation. Here are 20 games; each one is introduced, the features of the program described, instructions given on how to play, and the program explained. 9 are in BASIC and 11 in Extended BASIC. The great thing about this collection is that various programs have options to use joysticks, speech sythesizer, printer and disk drive, so there's something for everyone and every system. Apart from arcade-type games there's an address list program and an auto-sprite definition program as well. Well worth buying.

2. "Games for Your TI-99/4A" Andrew Nelson (Virgin Books Ltd) £2.95

22 programs for £2.95 has got to be good value. The programs are typeset from dot matrix printer listings but are easy to read. All but one are in console BASIC (the one in Extended BASIC uses speech, but not very impressively). If you enjoy typing in games from magazines like Home Computing Weekly, rush out and buy this book!

It was nice to meet Howard Greenberg and Ian Godman at the Northern Computer Show in Manchester - one TI-99/4A flag raised in a sea of Spectra! They even managed to sell me the "Smart Programming Guide for Sprites" - an excellent mine of information!

NOTES FROM THE NORTH.

(Soon to be changed to BRUSSELS SPOUTS see later!)

Someone else returns to the fold. Old TIHOMERS's may remember I had columns in the last 2 TIDINGS and very pleased I am to join your organisation. Hopefully I can pass on a few thoughts I've had since last in print.

Very INTEResting.

Do you realise that INT is very often unnecessary in your programs and particularly in TIBASIC they may run significantly quicker without it?

```
eg; 100 FOR I=1 TO 300
      110 CALL HCHAR(INT(RND*24)+1,INT(RND*32)+1,INT(RND*94)+33)
      120 NEXT I
```

This puts 300 random ASC characters on the screen in random positions and takes about 45 seconds.

NOW TRY-110 CALL HCHAR(RND*24+.5,RND*32+.5,RND*94+32.5)
in the above and you get the same effect in only 30 seconds.(Screen will, in fact, be exactly the same without RANDOMIZE).

How does it work?

Well, every time the TI needs an integer it quickly rounds the floating point number, apparently even if it already has an integer as there is no noticeable speed difference. X.500 etc. is rounded up and X.499 etc. down. This is a very powerful feature and you should try not to waste it by excessive use of INT. I've not found anywhere that integers are a must, even array subscripts and file nos. are just rounded.

Ah! but suppose you actually need integers for some reason? Well, if you know the range over which you'll need them, you can still save time by setting up an array and using the fact that subscripts are rounded.

eg:-Key in the following two programs which both return 1000 random integers from 1 to 10 - and check the timings.

```
100 DIM IN(10)           100 FOR N=1 TO 1000
110 FOR I=1 TO 10        110 P=INT(RND*10)+1
120 IN(I)=I             120 NEXT N
130 NEXT I
140 FOR N=1 TO 1000
150 P=IN(RND*10+.5)
160 NEXT N
```

Runs in 24 seconds.

Takes 38 seconds!

In both these examples notice the -0.5 shift which you must understand before attempting to use.

Relational Operators.

As a newcomer to the machine (is it really nearly 2 years ago?) I had trouble with the concept of Relational Operators so to help newer comers it's worth going over the ground again. An excellent illustrative example is the program for moving the cursor around the screen, published in TI*MES Vol1 No3 (page 31) This took up 20 lines, but can actually be written in only 10!

```
Viz; 100 CALL CLEAR
      110 CALL CHAR(44,"FFFFFFFFFFFFFFFF")
      120 R=1
      130 C=3
      140 CALL HCHAR(R,C,44)
      150 CALL KEY(0,K,S)
      160 IF S=0 THEN 150
      170 C=C+(K=68)*(C<30)-(K=83)*(C>3)
      180 R=R+(K=88)*(R<24)-(K=69)*(R>1)
      190 GOTO 140
```

Each expression in brackets in lines 170 and 180 becomes 0 if it is false and -1 if it is true. Think of them as (Does K=68?) etc.

Try to think through each key press (including invalid ones) and see what happens to R and C in each case.

As a further exercise you should be able to look at the original program and remove the unnecessary ABS functions, if you understand the concept.

Sound Effects.

The TI sound chip can produce interesting effects but it's not always obvious how to get them. I think readers should submit any ideas they have and to kick the ball off I hope 'Ramblin' Steve' will forgive me for digging out a bell sound from one of his C & VG programs.

```
100 FOR A=0 TO 30 STEP 5
110 CALL SOUND(-99,698,A,1924,A)
GOSUB.
120 NEXT A
```

The conventional wisdom has always been that Subroutines are better placed near the start of long programs but:---

- I've tried GOSUB/RETURNS in long programs and find that if you are already near the end of a long program then it is much quicker to go to a SUB(and RETURN) that is also near the end.
- To compound the mystery I recently read that someone reckoned (I think it was the famous J.T.Dow!) that commands themselves work quicker near the end of long programs. Not much point getting to a SR quicker if it's slower when you get there!

Does anyone have the definitive answer???

Random Integers.

Tips in magazines are usually excellent value (Especially in TI*MES!) but one odd item slipped into Vol4 Page41.

The Cincinnatti Group suggest the following for Random integers from -10 to 10

```
B=(-1)^(INT(11*RND))*(INT(11*RND))
```

Not only is this unnecessarily complicated but it will actually give 6 positive nos. to every 5 negative!! That could be cured by changing the first 11 to a 2 but this is simpler (and more than 3 times quicker!).

```
B=INT(RND*21)-10
```

There is a simple general rule for getting random integers in steps of 1 ie:

```
X=INT(RND*NO OF INTEGERS)+SHIFT FROM 0
```

Without the SHIFT series will always start at 0. In the above, -10 to 10 is 21 numbers (Don't forget 0!) with a SHIFT of -10.

If you want a step different to 1 the form is--

```
X=INT(RND*NO OF INTEGERS)*STEP+SHIFT FROM 0
```

```
eg:- X=INT(RND*4)*2+2 Gives 2,4,6 or 8
      X=INT(RND*2)*2-1 Gives -1 or +1
```

Speeding up TI BASIC.

I hope to be a regular contributor to TI*MES and you'll soon notice that I like to try and do things as quickly (Doesn't always mean as neatly!) as possible. Over the months I'll share the tips, but if anyone would like me to take a look at a routine I'd be happy to do so. (No charge!) TIBASIC is not the quickest language ever written but things can often be improved.

Books in French.

I now live in Belgium (Hence the title change!) and although Home Computers are less evident over here I think TI have (had!) a bigger share of the market.

If anyone would like me, on a purely private basis, to get hold of French language books on the TI there are quite a few available, including one of 102 programs (Eat your heart out Vince Apps!). The programs themselves are easy to follow with only INPUT prompts and PRINT lines in French (BASIC is the same) but ease of following descriptions will depend on your ability (or dictionary!).

Books are not cheap, 102 Progs being 850 Francs (about £11) but if interested drop me a line.

Au revoir mes amis.

IAN SWALES

Contact me at either:--

c/o 2, Blaydon Drive
Marske
Cleveland
(England)

or. A. Van Dycklaan 43
1980 Tervuren
Belgium

(Stamp is about 20p I think)

The "LOADER" program will enable you to experiment and with patience large and complicated pictures can be drawn like the Silk cut adverts. The following are examples using the three new commands.

MULTI-COLOUR MODE

```

100 REM *****
110 REM THIS PROGRAM WILL
120 REM DISPLAY 15 COLOUR
130 REM BARS TOP OF THE
140 REM SCREEN IN
150 REM MULTI-COLOUR MODE
160 REM *****
170 REM
180 CALL LINK("COLOUR")
190 CALL LINK("PAPER",4)
200 FOR A=1 TO 16
210 FOR B=1 TO 64
220 CALL LINK("INK",A,B,A)
230 NEXT B
240 NEXT A
250 GOTO 250

```

```

00 REM *****
110 REM THIS PROGRAM WILL
120 REM DISPLAY 16 COLOUR
130 REM BARS DOWN THE
140 REM SCREEN IN
150 REM MULTI-COLOUR MODE
160 REM *****
170 REM
180 CALL LINK("COLOUR")
190 CALL LINK("PAPER",4)
200 FOR A=1 TO 16
210 FOR B=1 TO 48
220 CALL LINK("INK",B,A,A)
230 NEXT B
240 NEXT A
250 GOTO 250

```

```

10 REM *****
20 REM * THIS IS A SAMPLE *
30 REM * PROGRAM WHICH *
40 REM * DISPLAYS A WHITE *
50 REM * BLOCK PUTTING *
60 REM * THE SCREEN INTO *
70 REM *MULTI-COLOUR MODE *
80 REM *****
90 REM
100 CALL LINK("COLOUR")
110 CALL LINK("PAPER",2)
120 CALL LINK("INK",24,32,16)
130 GOTO 130

```

```

10 REM *****
20 REM ADD THIS LINE
30 CALL LOAD(-31788,232)
40 REM YOUR SCREEN FILLS WHEN
50 REM YOU USE FCTN 4
60 REM *****
100 REM *****

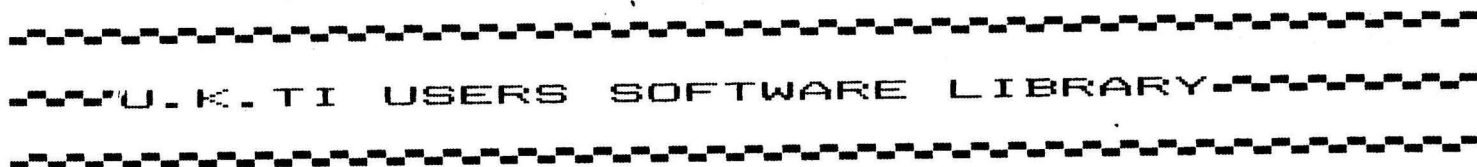
```

```

10 REM *****
20 REM ADD THIS LINE
30 CALL LOAD(-31788,224)
40 REM TO GET BACK TO NORMAL
50 REM YOU USE RUN
60 REM *****
100 REM *****
110 REM THIS PROGRAM WILL
120 REM DISPLAY 16 COLOUR

```

Our thanks to Sydney Michel of Gosport. If anyone produces a complicated picture let us know.



To receive a YAHTIZEE or another program on cassette/disk we ask members to submit their own programs for the Users-group software library. Programs must be original and NOT copy from commercial software houses or third party copyright programs (unless written consent is obtained to use such programs). Instructions on use should always be included.

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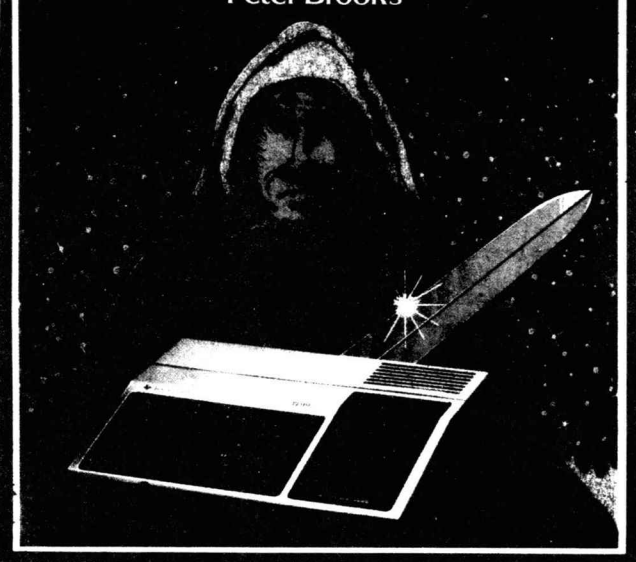
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Write to: TI99/4a EXCHANGE, 40 Barrhill, Patcham, Brighton, Sussex, BN1 8UF.

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It was with much pleasure (and not a little surprise!) when recently I found my 8-year old son playing "Color Math" on the computer. He has just discovered the good feelings that go with successfully solving math problems. Even though this particular program has little reinforcement (just a happy face flashed on the screen), he spent over an hour playing with it.

For many of us, helping our children learn was a primary reason for buying a computer. And generation of math problems is one of the most valuable and easiest tasks the home computer can perform.

Presented in this article is a short program demonstrating how math problems can be created and scored. The key to generating math problems is the RND function. This "pseudo-random" number is used to produce a number between zero and one which will vary in a random-like manner. But the RND function alone produces the same sequence of numbers each time it is called, unless it is preceded by the RANDOMIZE command. And since we usually want whole numbers larger than one, we must also use the INT function and multiply the RND or add some number to the RND to reach the range of number we are after.

The INT function merely erases any digits following the decimal point, causing 3.514 (for example) to become 3.

For instance, suppose we want some addition problems. We want to add two numbers, one of which is more than 100 but less than 500, and the other number must be less than 100.

Let's use X for the first number, and Y for the second. Then:

100 X=INT(RND*400)+100 generates an integer (no fractions) between zero and 399, and then adds 100 to it. Thus X is more than 100 and less than 500.

110 Y=INT(RND*100) generates a number between zero and 99.

The addition problem is then presented to the user and the user's reply accepted:

```
120 PRINT "WHAT IS";X;"+";Y;"?"
130 INPUT "":ANSWER
140 IF ANSWER=X+Y THEN 100 checks the answer
and generates another problem if it is
correct.
150 PRINT "TRY AGAIN"
160 GOTO 120 allows the user to try to
answer the problem again.
```



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The following program allows the user to answer problems of the four main math functions. There is only one level of difficulty for each type of problem: this is meant merely as an example of a math program. You will want to set up your own levels of difficulty using different numbers to multiply the RND by.

THE

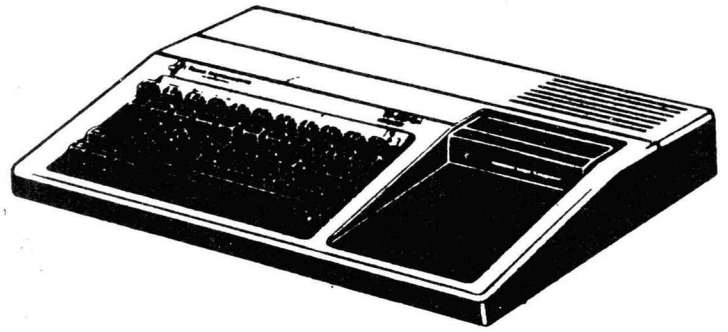
```

100 REM *****
110 REM * MATH DRILL *
120 REM *****
130 RANDOMIZE
140 CALL CLEAR
150 PRINT "TYPE OF MATH ";;;
160 PRINT : "1. ADDITION"
170 PRINT : "2. SUBTRACTION"
180 PRINT : "3. MULTIPLICATION"
190 PRINT : "4. DIVISION"
200 PRINT : "5. RANDOM MIX"
210 PRINT : "6. END DRILL";;;
220 INPUT "YOUR CHOICE? ":CHOICE
230 IF CHOICE=6 THEN 1180
240 IF (CHOICE<1)+(CHOICE>5)THEN 220
250 CALL CLEAR
260 PRINT "HOW MANY PROBLEMS (1-100)?"
270 INPUT NUMPROB
280 IF (NUMPROB<1)+(NUMPROB>100)THEN 260
290 FOR I=1 TO NUMPROB
300 CALL CLEAR
310 TYPE=CHOICE
320 IF CHOICE<5 THEN 340
330 TYPE=INT(RND*4)+1
340 ON TYPE GOTO 400,540,680,820
350 NEXT I
360 GOTO 1110
370 REM *****
380 REM * ADDITION *
390 REM *****
400 X=INT(RND*100)
410 Y=INT(RND*100)
420 PRINT "WHAT IS ";X;"+";Y;"?"
430 INPUT ANS
440 IF ANS=X+Y THEN 960
450 IF WRONG=2 THEN 490
460 WRONG=WRONG+1
470 PRINT : "TRY AGAIN"::
480 GOTO 420
490 PRINT : "SORRY, THE ANSWER IS";X+Y
500 GOTO 1020
510 REM *****
520 REM * SUBTRACTION *
530 REM *****
540 X=INT(RND*100)
550 Y=INT(RND*(X+1))
560 PRINT "WHAT IS ";X;"-";Y;"?"
570 INPUT ANS
580 IF ANS=X-Y THEN 960
590 IF WRONG=2 THEN 630
600 WRONG=WRONG+1
610 PRINT : "TRY AGAIN"::
620 GOTO 560
630 PRINT : "SORRY, THE ANSWER IS";X-Y
640 GOTO 1020
650 REM *****
660 REM * MULTIPLICATION *
670 REM *****
680 X=INT(RND*100)
690 Y=INT(RND*100)
700 PRINT "WHAT IS ";X;"*";Y;"?"
710 INPUT ANS
720 IF ANS=X*Y THEN 960
730 IF WRONG=2 THEN 770
740 WRONG=WRONG+1
750 PRINT : "TRY AGAIN"::
760 GOTO 700
770 PRINT : "SORRY, THE ANSWER IS";X*Y
780 GOTO 1020
790 REM *****
800 REM * DIVISION *
810 REM *****
820 X=INT(RND*100)
830 Y=INT(RND*(100-X))

```

MSP 99 NEWSLETTER

```
840 PRINT "WHAT IS";X*Y;"DIVIDED BY";Y;"?"
.
850 INPUT ANS
860 IF ANS=X THEN 960
870 IF WRONG=2 THEN 910
880 WRONG=WRONG+1
890 PRINT : "TRY AGAIN"::
900 GOTO 840
910 PRINT : "SORRY, THE ANSWER IS";X
920 GOTO 1020
930 REM *****
940 REM * CORRECT ANSWER *
950 REM *****
960 PRINT : "THAT WAS CORRECT"
970 WRONGTOT=WRONGTOT+1
980 REM *****
990 REM * DELAY LOOP & *
1000 REM * ERROR COUNTING*
1010 REM *****
1020 FOR DELAY=1 TO 500
1030 NEXT DELAY
1040 WRONGTOT=WRONGTOT+1
1050 WRONG=0
1060 GOTO 350
1070 REM *****
1080 REM * DISPLAY % *
1090 REM * CORRECT *
1100 REM *****
1110 CALL CLEAR
1120 PRINT "NUMBER OF PROBLEMS=";NUMPROB
1130 PRINT "NUMBER CORRECT=";NUMPROB-
WRONGTOT
1140 PRINT : "PERCENT CORRECT=";INT(100
* ((NUMPROB-WRONGTOT)/NUMPROB)+.5);"%"
1150 FOR DELAY=1 TO 500
1160 NEXT DELAY
1170 GOTO 130
1180 END
```



MSP 99 USERS GROUP
P.O. BOX 12351
ST. PAUL, MINNESOTA 55112

```
100 REM Music Program by Rob Williams of
102 REM TI Users Group of Perth, Australia,
104 REM listed in ChiTimes Newsletter,
106 REM Chicago-Area TI Users Group,
110 REM Vol. 2, No. 6, Summer 1983
120 V=8
130 T=600
140 T1=T/4
150 FOR I=1 TO 5
160 CALL SOUND(T,659,V,784,V,981,30,-4,0)
170 CALL SOUND(T,440,V,523,V,1310,30,-4,0)
180 CALL SOUND(T,494,V,587,V,1470,30,-4,0)
190 CALL SOUND(T,523,V,659,V,825,30,-4,0)
200 IF I=5 THEN 280
210 FOR J=1 TO 4
220 READ N
230 CALL SOUND(T1,110,30,110,30,N,30,-4,0)
240 NEXT J
250 RESTORE
260 NEXT I
270 DATA 470,1310,1236,1101
280 STOP
```

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See review in 99'er April 1983

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