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Contributions should be submitted either on diskette in TI-Writer compatible files, or in a form which is as legible as possible. Art work should fit within an A4 area and should not contain colour. Very high contrast line drawings are preferred, and these may be produced by arrangement with the publisher.

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SEE YOU AT THE BIRMINGHAM SHOW SATURDAY OCTOBER 26TH!

JUST WHEN YOU THOUGHT IT WAS SAFE...  
-----

You may have heard that floppy disks can now hold just about as much as they're ever likely to, and that video disks will probably take over in the near future.

Along comes an advance in technology which is from another field - Holography - which threatens to destroy that myth with a vengeance.

The current best density for a floppy disk is about 1,000,000 bits per square centimetre of disk surface.

A little gizmo called a PHASE CONJUGATE MIRROR would be capable of boosting that to 1,000,000,000,000 (12 zeros - I counted 'em) or 1E12 in BASIC. It has been suggested that the increase in capacity is so vast that it is unlikely to be made use of. However, that has never stopped manufacturers in the past, so we may look forward to all sorts of advances incorporating the Phase Conjugate Mirror in the years (months ?) to come.

~~~~~

HANDS ACROSS THE POND  
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I have received newsletters from two groups outside the UK: TINS, the User Group from Dartmouth, Nova Scotia; and a joint production from OH-MI-TI and NEW HORIZONS Users Groups (NorthWest Ohio 99'er News). I am responding to them and we will be exchanging newsletters, OTIU is granted honorary membership in these groups, and they are accorded a similar position here.

Some of the articles contained in the newsletters are fascinating: there are one or two items from the Australian newsletters which will intrigue the hardware buffs. In time I will present material from these and other newsletters, and I am hopeful that over the next few months TI-LINES will contain more material from UK owners. It can't be much fun for the overseas groups to simply have their own articles regurgitated and sent back to them each month (a comment which I have made before in the past).

Anyway, a warm welcome to PAUL MEADOWS and his members from TINS, and to BILL SAGER of the NEW HORIZONS User Group who wrote on behalf of the two Ohio groups, and their members.

~~~~~

LANGUAGE, LANGUAGE  
-----

I have a request from OTIUser RICHARD SIERAKOWSKI for information and programs (especially Public Domain programs) relating to p-Code, Pilot, and especially ForTran. I have a vague recollection some time ago of having read that Pilot was still available for the TI (running under the p-Code system, I think), but if anyone can shed any light on the subject I (and Richard) would be very grateful. You can send anything to me at the address on the title page, or to Richard at:

Rusholme  
Elcot Lane  
MARLBOROUGH  
Wilts  
SN8 2BA

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## THE ROBOTS ARE COMING...I

---

You may remember way back when... I mentioned the Robot Ping Pong Contest, which was due to have its first heats earlier this year. Well, the heats came, and so did the "robots", which were not recognisable (if that is the appropriate word) as robots as we have been prepared for them by the film-makers. Two managed to make a stab at...well, not so much playing a game, as responding fast enough to return the ball to the server. PERSONAL COMPUTER WORLD's Chip Chat discussed the event, and reminded readers that five years ago what was to become the best and fastest MicroMouse to negotiate the maze didn't get off to an auspicious start. Life is going to get interesting (you mean it isn't so already?).

~~~~~

## THE ROBOTS ARE COMING...II

---

Also from PCW comes the monthly report from Japan's Shinichiro Kakizawa, from which I have quoted in the past. I'm going to do so again. The Japanese are steadily eroding that firmly-held but totally-false belief in the West that they are incapable of doing anything other than imitating (and in the process, improving greatly) our inventions. The Japanese, it is held in the West, cannot invent for toffee. Hmmm. They seem to be doing alright from where I stand. Shinichiro's report on the Tokyo Toy Fair '85 mentions at least three products which, for toys, seem to be outstripping some of the 'serious' machines over here.

For example, the Science Robo-RK from Bandai can manage two-legged walking, achieving its balance through an internal gyroscope. The direction of movement is radio-controlled, and apparently its gait as it paces about is smooth and fun to watch. Its cost is around £18, which presumably means that it is a titchy robot, not a full-height rival to Richard Chamberlain in BBC TV's 'Shotgun' (my pronunciation). Another eye-catcher was Tomy's SR3. (Alert readers may recall that Tomy produced a micro which had TI chips inside). SR3 is a 'reactive' robot (which implies that, like some other more primitive toys, it can react to 'external stimuli' - like you clapping your mitts, or whistling tunelessly). This puts me in mind of a sort-of robot reported in the late COMPUTER AGE, a monthly micro mag much mourned by yours truly. It responded to sudden noises by shrinking away from them, but would lean towards gentle sounds. It was only put together for an exhibition, and was, alas, dismantled afterwards.

SR3 it seems is made of more durable stuff. It swings its arms and moves its neck as it walks (query two-legged walking?). Shouted at from a distance, or scolded, it suddenly stops walking, hangs its head, and mutters an apology. A must for those who like being mean, vicious, and nasty to others. Postmen who fold floppy disks please note.

SR3 comes at an attractive £16, which too indicates that it is a tiny tot.

Also from Tomy is Omni 2000. This is a multi-function, sensor-based, voice-recognition robot, whose function is a little beyond the toy capability. This should tell you that it probably costs a lot more, only I can't tell you 'cos Shinichira didn't tell PCW!

Omni 2000 sounds more like the film-makers idea of a robot. It can carry goods by hand, and if you have a portable rechargeable vacuum cleaner at home, it can be left to clean a room for you. The robot's sensory system recognises obstacles such as walls and chairs (phew!) changing its direction automatically and continuing its work. For home use, it is halfway between a toy and a serious machine. No information on its manner of gait, but presumably as Bandai (see earlier) claim that Robo-RK is the first real, walking robot you can assume that Omni 2000 wheels its way around.

Like I said, Life is getting interesting. At least one TI owner is beginning to develop an interest in robotics - ALAN DAVEY, the Information Provider behind 4ABC, his showcase Bulletin Board (see elsewhere) - and I have no doubt that there will be others. I still nurture hopes of publishing a Special Interest series of booklets within the Grand Booklets Scheme (which now has its first independant contributing author) covering small hardware projects to be undertaken with a 99/4A, perhaps even robotics. Watch this space.

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#### ONLY THE IDIOTS UNDERSTAND

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And I thought I was bad enough. Via ALAN DAVEY from his wife (who reads the Editorial in TI-LINES and who was invited to contribute something on behalf of the wives/girl friends of dedicated DTIUsers) comes this eminently sensible suggestion. Ahem. It is suggested that I run a competition (for anyone who dares to be marked for life!) in which members are challenged to find the daftest/funniest/most apt four-word phrase, in which each of the words begins with the letters D, T, I, and U. Hence the title of this..er..item.

It is also suggested that the first prize be "a slab of jelly or something like that".

Accordingly, if you are a lover of jelly (flavour to be requested with your entry), have a bash and see what you can come up with. No kidding.

~~~~~

#### FOOD FOR THOUGHT

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Dops, Oh Dear, and expressions like Naughty Peter You Have Been Telling Porky Pies. Well, not really. You may remember the timely warning last issue about the right voltage regulator to be used (ref: MARTIN ROSS, page 4, V2.3) when attempting to upgrade the PEB power supply. The original newsletter from which the article was taken was rather faded, and I judged that the incomplete digit in the specification "ua7?H12KC" was a 9. Further investigation has now revealed that the article specified an 8, not a 9. The fault is therefore mine, and not JOHN COLSON's, just to set the record straight. I am beating myself senseless with a lettuce even as I type...

~~~~~

#### 4ABC AND ALAN DAVEY

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This is just a brief resume of details concerning ALAN DAVEY's Bulletin Board - well, it's not strictly speaking a Bulletin Board, as there is no facility to directly add your own material to the pages of information. It is really, as Alan says, a sort of "starter" notice board, with the intention of allowing the TI owner newly-endowed with Modem and TEII to get to grips in the simplest possible way with the techniques of accessing and perusing such notice boards.

Alan intends to act as an IP - Information Provider - which really means in this case that his 10 pages of 40 characters by 20 rows of text will contain "signposts" to other information sources: that could mean either a name and telephone number of a specialist in one or more fields of the 99/4A system, or a list of reference literature perhaps.

It is not Alan's intention - well, not for a good while yet, anyway - to set up and operate a two-way Bulletin Board like most of the others available. That can come later if he has more equipment which he can dedicate to the task (and when he can find some way of covering running costs - like the rental on the BT phone line, and electricity, for example).

For the time being then, Alan will run his board on Sundays from 10 am to 10 pm. If you are thinking of trying to get through onto his board, it would be a good idea to check with him first during the week so that he knows that you will be interested in the experience if nothing else. The number is 04606 4511, and Alan has modified his entry requirements so that you need only select the default setting (Option 3, if I remember rightly). This simplifies things from your point of view as you don't have to create a special Log On file or anything confusing. Once you have established contact, pressing ENTER is all you should need to do in order to begin receiving instructions and information.

It is worth bearing in mind that Alan's project is totally home grown; he found out by trial and error (plenty of trial!) what he needed to know, and then wrote his own program from scratch and with little programming experience and no BBS experience behind him. To the best of my knowledge his is the only TIBBS in the UK, although there are a number operating elsewhere in the world (see elsewhere for a list).

I understand that one OTIUser has already been through 4ABC, as Alan has called his board, so it does work!

Contact Alan for more details should you need them.

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PERSONAL COMPUTER WORLD SHOW 1985  
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On Saturday 7th. September a small band of OTIUsers met at my hovel in order to descend on Olympia and meet up with another small band of OTIUsers. GORDON PITT (chauffeur par excellence), TREVOR DAVIES, RICHARD SIERAKOWSKI and I arrived at the show without too many adventures and within a short while we had our noses pressed against the glass on part of the Atari stand, drooling over the demo of a S20ST with hard disk. It had previously been arranged that we would meet up at 2 pm with PHILLIP MARSDEN, STAN DIXON, and NEIL LAWSON with a view to having a general conflagration and possibly deciding on something stunning for the October event being organised by CLIVE & AUDREY SCALLY. In fact we met Uncle Clive and Auntie Audrey and their scallywags quite by chance and had a noisy chinwag (due mostly to the horrendous din being put out by some exhibitors) about Life, The Universe, and Everything.

We exhausted ourselves trundling round the Hobbyists Hall, and then wangled our way into the Business Hall ("registering" in the process, which means that we will all be getting bumph for months to come!), where the more human element had also migrated. Perhaps limiting the Business visitors to age 18 and over has something to do with it; either way, we had fewer mindless, mannerless morons to cope with in there. The only trouble was, we had to be careful of attracting the attention of the voracious salesmen on the stands. Even a flickering glance was enough for one to pounce, and I had some interesting if untruthful exchanges (ably assisted by my fellow directors of the firm who were probably wondering if I was going to end up with several thousand pounds worth of gear in the mail the following week!).

We did come across one highly interesting product, though: a 56K CP/M micro with a single drive (320K) selling for just £250. It was in fact an Alphatronic from Adler, which had failed to sell as well as the company had hoped, and the firm at the show had bought 1000 units for sale at this advantageous price. If you are not familiar with CP/M, let me tell you that there are more software packages written for CP/M than for any other operating system, and from my point of view, although I hate CP/M, the portability of the Alphatronic system would mean that I could trundle a full word processing system (WordStar) into work with me and run up material in my coffee breaks/lunch hour/any spare moment. My TI set-up is far too bulky and cumbersome to even think of doing that.

Trouble is, I don't have the spare capital at present. But if I had...

All in all, a very enjoyable day if extremely tiring, and to cap it all, due to some minor hiccups in a simple exercise I tried out before hitting the sack on the Saturday night, it is now Sunday afternoon and I haven't managed to grab forty winks yet. What a life!

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DOWN AND OUT  
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While dawdling at the ARGUS SPECIALIST PUBLICATIONS stand (they produce HOME COMPUTING WEEKLY amongst others) looking for evidence of another, trade, mag for which I used to write, a bearded individual suddenly said "Hello Peter" (he had read my name badge, cunning devil) and it turned out to be DAVE CARLOS, Editor of HCW. We nattered for a while, and then he told me that ASP had dropped no less than 8 publications in the week prior to the show. I took down the details of those destined for the chop, and of the 8 only two were really of any interest. COMPUTING TODAY, which never catered for the TI but which has been the source of quite a lot of useful information, and, surprisingly, PERSONAL COMPUTING TODAY, big sister to HCW. I was amazed at this, having only recently sent in a book review to its editor, IONE HOLMES. PCT have published items on the TI in the recent past - in fact, they were the first mag to publish a couple of articles by MIKE O'REGAN in the early days - and some of my software reviews (in the days when I had time to do them!) have appeared there as well as in HCW.

So, it seems that we are now down to rare appearances in HCW (there are a few readers' submissions still awaiting publication), and to similar showings in COMPUTER & VIDEO GAMES (although I must admit I have not seen anything in recent months in the issues that I have lashed out and bought).

It seems most unfair. The sole reason for the national magazines dropping the 99/4A appears to stem from the fact that TI are no longer producing it, and nothing more. Pity any other micro owner if the manufacturer stops production. As far as the publishers of national mags are concerned, that doesn't mark the autumn of the life of the machine, it constitutes a death certificate, and by their action, they precipitate the demise of the machine.

There's really only one thing you can say. ██████████

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BULLETIN BOARD  
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FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE

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Dr J. D. BAINES has a couple of items still outstanding which he would like to sell: an EDITOR/ASSEMBLER manual for £7.50 plus postage, and similarly a set of "single" cassette leads for £5. Contact me in the first instance.

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USABLE CASSETTE RECORDERS  
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Every so often someone calls me with a query about cassette recorders - usually to ask if I can recommend one, or to check if one particular make is known to cause problems. I meant to include in an earlier issue this short list of machines which are, or have been, in use, but true to form I kept forgetting to do anything about it. I am now remedying the omission. I hope.

Top of the list, I suppose, comes TI's own product, which probably can't be got now for love nor greasy oncers (unless someone tells me otherwise?).

The rest so far are:

|               |                  |                |
|---------------|------------------|----------------|
| ALBA R150     | JONES CT5105     | SHARP CE152    |
| BOOTS CR 325  | MARANTZ C190     | WHSMITH CCR800 |
| BUSH 3150     | TENSAI 104       | HITACHI TRQ299 |
| CROWN CR102   | TENSAI 106       | LLOYD V182     |
| FERGUSON 3T27 | PYE AUDIO TR3653 |                |

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Handling PRK files with Enhanced BASIC

by Franc Grootjen and Paul Karls  
 Blauwgras 2  
 3902 AA VEENENDAAL -  
 The Netherlands

Owners of the Personal Record Keeping (PRK-) module will have discovered the many advantages of this useful preprogrammed file handling system. Some may have even heard about an interaction with TI BASIC to format an INPUT or PRINT anywhere on the screen with CALL A and CALL D respectively, aptly christened Enhanced BASIC ( See 99-er volume 1, no 4 page 72)

Few will have heard of the further features of Enhanced BASIC enabling the user:

- a. to change any characteristic of once chosen pages without losing all the entered data.
- b. to perform mutations upon PRK-data which are not possible with the PRK options.
- c. to use two independant memory systems side by side and in conjunction.
- d. to perform string operations on PRK-data.
- e. to save long arrays quickly without problems.

I am driving at the use of the statements:

CALL P  
 CALL L  
 CALL S  
 CALL G  
 CALL H

CALL P(p)

In order to prepare or partition the RAM memory space in two sections the statement CALL P(p) has to be entered in the immediate mode as a first action after the TI BASIC READY prompt from the computer and must be followed by NEW. In this article we will refer to MEM1 (= normal RAM) and MEM2 (=PRK file memory). In the position of p in CALL P(p) a number (constant) must be used ( an integer between -4 and 13821) which points to the spot in the RAM stack where OLD will start loading instead of what otherwise would have been the starting address reserved for OLD. The memory space below this point is the thus created MEM2 (see figure 1) and consists of p bytes.

figure 1

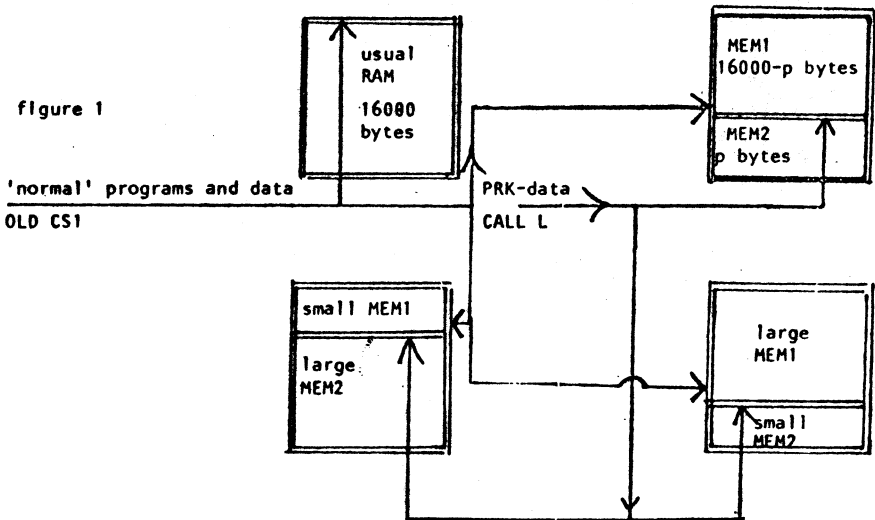


figure 2a

figure 2b

If you need a large MEM2 (e.g. because a large PRK file has to be loaded) then p must be in the higher range. (figure 2a) This obviously at the same time restricts the size of MEM1.

If on the other hand you have a large TI BASIC program or need to load a lot of 'normal' data, but still you want to interact with a PRK file as well, then you are best off with a large MEM1 and a small MEM2 (figure 2b). Then in the CALL P(p) statement you assign a low value to p.

If you are still with us then it will dawn upon you that this beautiful mechanism enables you to freely choose the ratio of MEM1 against MEM2 to suit any particular application. MEM1 is cleaned and loaded with programs and data in the usual way with NEW, OLD, SAVE, INPUT and PRINT without affecting MEM2 in any way. PRK-data are loaded in MEM2 with the statement:

CALL L("CS1",C) resulting in the usual cassette prompts which will now read data previously generated by the PRK module in its normal mode.

An error message: ERROR DETECTED IN DATA probably means that MEM2 is not large enough to contain the PRK-data and a new CALL P(p) with a higher p must be entered (and followed by NEW). The quickest and surest way to remove the previous CALL P is to switch the console off and on again.

MEM1 can be used:

- a. normally as if MEM2 had not been prepared
- b. in the direct mode interacting with the loaded PRK-data
- c. to load a program in TI BASIC that interacts with PRK-data or even loads or saves PRK-data when this program is RUN, as program lines with CALL L and CALL S (you guessed it, S for save) are permitted.

The syntax and parameters of CALL L and CALL S are:

CALL L("CS1",C)            and            CALL S("CS1",C)

C is a control variable that gets a value 0 if loading or saving has been successful. When an error has been detected the value of C is not equal to 0.

Instead of "CS1" also "DSK1" or "RS232" may be used for similar interaction with these devices.

There are only 2 statements that can be used in the TI BASIC (or rather Enhanced BASIC, a term coined by Peter Brooks of the British Users group) dominating MEM1 that cross the borderline between MEM1 and MEM2. These two statements are:

CALL G    and    CALL H

The CALL G ( G for getput) statement has a write mode and a read mode. In the write mode it enables the user to change PRK-data, which might also have been changed using the normal procedures of the PRK module (change a page and mathematical transformations).

But the values can also be taken from variables which in turn get their values from the whole bag of tricks of TI BASIC including string handling (which otherwise lacks in the module). Needless to say this dramatically enhances the versatile use of the PRK-data, the more since the saved data (CALL S) can be reloaded in the module mode, permitting their further use 'module fashion'.

The syntax and parameters of CALL G are:

Read mode: CALL G ( 1,PAGE,ITEM,MIS,VALUE)

Write mode: CALL G ( 0,PAGE,ITEM,VALUE)

MIS is a control variable: if data found then MIS=0. When no data found MIS=1.

Note 1: If a string variable is taken for VALUE (e.g. VALUES) and the ITEM type was chosen as 'characters', then strings can be handled

Note 2: CALL G(2, PAGE,ITEM,VALUE) writes 'nothing' (=missing data) in the assigned place. The value of VALUE has no meaning.

Note 3: Although not mentioned each time, these techniques also work with the Statistics module.

CALL H effects the header, i.e. those choices that the PRK does not permit you to alter, once you have okayed the file structure.

Changing the names of FILES and ITEMS is a cinch.

Changing the type or width if ITEMS is also easy, but the results are usually not the ones aimed for, because all data are written sequentially as beads glued on their string. Nevertheless it is possible to change any entry for the file structure maintaining the right data in their correct place, but this requires routing through a special TI BASIC program. This will be discussed in a future article. For those of you too impatient for this feature we recommend you buy the SSS Command module 'Personal Record Generator'.

Apart from then disposing of several features described in this article, you also overcome the frustration of having spent days and days entering data in a PRK programme and then coming to the conclusion that a small change in file structure is necessary forcing you to start from scratch.

The syntax and parameters of CALL H are:

Read mode: CALL H(1,INFO,ITEM,VALUE)

Write mode: CALL H(0,INFO,ITEM,VALUE)

| INFO | Stands for                                                    |
|------|---------------------------------------------------------------|
| 1    | File name (maximum of 9 characters)                           |
| 2    | Day of the month                                              |
| 3    | Month                                                         |
| 4    | Year                                                          |
| 5 *  | Number of items per page                                      |
| 6 *  | Number of pages                                               |
| 7 *  | Length of header in bytes                                     |
| 8 *  | Length of each page in bytes                                  |
| 9    | Item name (maximum of 9 characters)                           |
| 10   | Type of item (1=char; 2=integers; 3= decimals; 4= scientific) |
| 11   | Width of item                                                 |
| 12   | Number of decimal places                                      |
| 13 * | Amount of memory required for this item in bytes              |
| 14 * | Position of item in page                                      |

\* = this value is automatically calculated and placed by PRK mode

The ITEM value is of no importance for those INFO values between 0 and 9

Setting up the header (i.e. file structure) is easiest in the module mode (Let's begin-create a file), but if you insist on doing this from TI BASIC start with INFO 9 to 12 before going on to INFO 1-4.

We intend to give examples of the practical use of all this knowledge in future articles covering such subjects as an easier way to save arrays and word processing in PRK-files.

Although Texas Instruments are obviously aware of these possibilities they have not considered them perfect enough to document them and 'sell' them officially. The authors declare that although inside information from TI made this article possible, that in no way can Texas Instruments be held responsible for its contents, nor are the authors who present these data in good faith but without any warranty whatsoever.

Still we consider knowledge of ENHANCED BASIC important for a complete enjoyment of your TI99/4(A).

And that is what counts !



-----  
L E T T E R S  
-----

OTIUser RAY ELLIOT writes:

I like playing with Forth, but so far I don't seem to be able to get many programs to work. Most of the instruction books use Forth-79 or Poly-Forth, and they do not convert easily. For example, Appendix C of the TI Forth manual gives a conversion for the word 'PLUS' from STARTING FORTH, page 277 --- it doesn't work!!

The only thing that I have had any real success with is STEPHEN SHAW'S quick load program from TI\*MES Spring Issue. A very useful program indeed. There are a couple of points which need to be made, though:

- 1) In order to get a word into memory you must LOAD the screen first. Therefore in order to find where the word PAGE is, you must type

3 LOAD

before typing:

' PAGE .

- 2) When you have finished and are ready to enter screens on your working disk, the first screens you must enter are copies of screens 4 and 5 from Appendix I. These are the screens containing the Error messages. Type them in exactly as shown, then FLUSH.

Do not LOAD these screens, as they will be loaded automatically by the Forth program.

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DAVE HEWITT wrote to me about his attempt to build a 32K RAM Expansion. He has managed to get it working, and if anyone wants details of the upgrade they can send him a large SAE and he will post them a copy of the article. Contact him at 311 London Road, HEADINGTON, Oxford, OX3 9EJ.

However, all is not a bed of roses. Dave has experienced a few problems when trying to use CALL LOAD() with some of the values published in previous issues of TI-LINES. For example, if he attempts to use GRAHAM HILTON'S method for placing two programs in memory simultaneously, he has a number of problems. If the programs are short, the line number table pointers are zero! If the programs are fairly long, the technique does seem to work partly, but often the attempt to re-institute one program results in either a corrupted listing or nothing at all, and even when things do appear to have gone OK, the use of SIZE indicates that there is still no program present!

Dave also seems unable to turn the 32K off in the usual manner using CALL LOAD. Any attempt to do anything after CALL LOAD(-31868,0,0) results in a crash. Has anyone else experienced problems like these ?

Finally, Dave has acquired a Quantex Series 6000 dot matrix printer with serial interface. Has anyone a manual that he could borrow ? Contact him at the above address. Thanks.

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# TI FORTH

## A TI-FORTH UPDATE

### Another Manual Omission

By DAVE WUNDERLIN from the newsletter of the MSP 99 USER GROUP

When experimenting with the SCREEN command (it looked simple enough to master) I found that every time I entered a colour number and executed it, (sample given in chapter 6 page 3 of the FORTH manual) the screen changed colour but all the text I may have had on the screen disappeared. I could, however, still enter commands and have them work, but not being able to read the screen was a definite handicap. Investigating the SCREEN command in APPENDIX D, I could not see what I was doing wrong. The format ( n --- ) implied that a number then the command SCREEN was all I needed. Which was exactly what I tried.

On to SCR 58, line 4 I found the definition : SCREEN ( COLOR --- ) 7 VWTR ; With SCREEN being the name of the procedure, ( COLOR --- ) being a comment statement, 7 being another number being added to the stack, VWTR an unknown command at this time, and a semicolon finishes off the procedure.

Now I had to find out what VWTR did. Back to APPENDIX D. On page 64 of the appendix I found my best lead. It stated that VWTR writes the given byte into the specified VDP write-only register. ( b n --- ) b was my color, n is register 7. Now I knew that VDP meant Video Display Processor leading me to the EDITOR/ASSEMBLER manual. On looking up VDP in the index I found VDP write-only Register was on page 326.

Now on page 328 I found the answer to my problem. Under VDP Register 7 it stated: Bits 0 - 3 are the color code of the foreground color in the TEXT MODE. The FORTH manual on SCREENS makes no mention of the TEXT MODE as being special. BITS 4 - 7 is the color code for the background color in all modes.

To sum up what I found:

When in the TEXT MODE you will need to have a HEX value with two DIGITS like "F1". This will set the foreground to white, the background to black. The original sample set the foreground to transparent, therefore I was unable to see what I had on it.

In any other MODE you only need a single hex value as given in the sample in the FORTH manual.

I hope this solves the problem for someone else and you won't end up spending several hours pulling your hair out looking for what you did wrong like I did.

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DAVID BROWN  
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Hello. This is the first bit I've written for TI-LINES since I renewed my subscription. This lot should have been in issues 1 and 2 of volume 2, but before I went to enjoy myself on holiday, I forgot to post everything to Pete and therefore I missed the deadline. So this month is a revised copy of what should have been in issues 1 and 2 plus a bit more...

Most of the stuff that is here is from Richard Owen - I don't know how I'd be able to get anything out now without him. I had better stop rabbiting on because there is so much to get on with, so here goes...

You will already have read Part 2 of Part 1 (?) of Richard's series on 9900 Assembly (I hope). Now here are the answers to the quiz he produced all those years ago. (Remember the one? Its in issue V1.14)

- |                  |                        |
|------------------|------------------------|
| 1) PARSEC        | 12) JOYSTICK           |
| 2) ALPINE        | 13) OTHELLO            |
| 3) DISK DRIVE    | 14) SOCCER             |
| 4) PRINTER       | 15) CHESS              |
| 5) COMPUTER      | 16) AMAZING            |
| 6) STATISTICS    | 17) MUNCHMAN           |
| 7) TILINES       | 18) MODEM              |
| 8) BASIC         | 19) TI INVADERS        |
| 9) TAPE RECORDER | 20) SPEECH SYNTHESIZER |
| 10) ASSEMBLER    | 21) ADVENTURE          |
| 11) CASSETTE     | 22) TEXAS INSTRUMENTS  |

Hope you didn't lose too much sleep over that little lot...

Now, here is a bit more from Richard. I don't really need to explain it at all because he has explained everything and has even provided a line-by-line examination of the program. Also included is a listing of 100 4-letter codes that the program uses - you've got to find out which one it is!

I'm sorry that I have been unable to produce anything this month - all the work here is Richard's, I've simply put it together, but I'm having trouble with my computer (certain keys won't work and one of them is ENTER).

Due to this, I have been unable to mess around and find out anything new. I think I will write to COMPUTER FIX, the company Pete mentioned in V2.1. I will publish more details about the firm in next month's issue. But in the meantime my computer is absent without leave.

SEE YOU NEXT MONTH

*Dave Brown*

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THE EFFECTS AND USES OF ENTRANCE CODES

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By RICHARD OWEN (requires Extended BASIC, Speech Synthesizer, and a colour TV)

First things first:-

What are entrance codes ? An entrance code is a unique phrase or number which is the only way to get into a system. e.g. A telephone number, or a bicycle combination lock.

How can they be used with a program? First of all, I asked the same question. But instead of an answer, I was shown a Sinclair Spectrum game... Don't scream! It does show though that Spectrum software houses are very keen to cut down on software piracy. (As are all software houses...)

Let's have a little peek at the program...

Here is the finished version... although I'm sure that anybody could make it a little more spectacular!

```
100 CALL CLEAR
110 QUIT=0
120 RANDOMIZE
130 DIM CODE$(10,10)
140 REM CODE$(R,C)
150 REM R=ROW C=COL
160 FOR A=1 TO 10
170 FOR B=1 TO 10
180 READ CODE$(A,B)
190 NEXT B
200 NEXT A
210 R=INT(RND*10)+1
220 C=INT(RND*10)+1
230 CALL COLOR(5,13,13):: CALL COLOR(6,14,14):: CALL COLOR(7,7,7):: CALL
COLOR(8,11,11)
240 DISPLAY AT(10,1):"What is the colour at:"
245 DISPLAY AT(11,10):"row";R;" ,column";C
250 A$="WHAT IS THE COLOR AT "&STR$(R)&STR$(C)
260 CALL SAY(" ",A$)
270 ACCEPT AT(12,12)VALIDATE("RGYM"):COD$
280 IF COD$=CODE$(R,C)THEN 480
290 QUIT=QUIT+1
300 IF QUIT>2 THEN 330
310 CALL SAY("TRY AGAIN PLEASE")
320 GOTO 210
330 CALL SAY("YOU DO NOT KNOW THE COLOR")
340 CALL SAY("GOODBYE")
350 REM BACK TO MASTER SCREEN
360 CALL INIT
370 CALL LOAD(-31804,0,36)
380 DATA RGYM,GYMR,YMRG,MRGY,RRGG,GGYY,YYMM,MMRR,RRRR,MMMM
390 DATA GRYM,GRMY,YMRG,MMMG,GGGR,MMGR,MMYY,GRRM,GGGG,RRRR
400 DATA YYYY,GGGG,MMMM,RRRR,YGMR,YYGG,GGMM,MMRR,RRBB,RRGG
410 DATA GGGY,YGYG,MRMR,RMRM,YGYG,YMYM,RGRG,GRGR,MYMY,YYMM
420 DATA YRGM,MGRY,YMGR,RGMY,GRMY,YGRM,YYYM,GGGY,RRRG,MMMM
430 DATA RMGM,YMRM,RMGM,YMRM,GMYM,YMYM,YMYM,GMGM,RMRM,GMGM
440 DATA RMGM,YMRM,RMGM,YMRM,GMYM,YMYM,YMYM,GMGM,RMRM,GMGM
```

```

450 DATA YMGM, RMYM, YMG M, RMYM, GMRM, RMRM, RMRM, GMGM, YMYM, GMGM
460 DATA MMMM, RRRR, GGGG, YYYY, MRGY, YGRM, RGYM, MRGY, YGRM, MRGY
470 DATA RRRR, GGGG, YYYY, GYMR, MRYG, RRRR, MMMM, GYMR, YGRM, MRGY
480 FOR COUNT=0 TO 14 :: CALL COLOR(COUNT, 2, 1):: NEXT COUNT
490 REM REST OF PROGRAM....

```

The program itself is very simple... and lines 380 - 470 represent the codes for input. The number of codes are as many as you can get into memory... The more codes, the safer your program.

Let's go through it line-by-line (no, we aren't in Minimem)

```

100 This clears the screen
110 This sets variable QUIT to 0(QUIT is to see how many times you don't know
the code
120 This statement gives a random number when RND is encountered
130 This DIMensions CODE$ to how many Rows, by how many Columns
140 REM
150 REM
160 This starts a for-next loop using A as the variable from 1 to 10. This is
the Row branch. (If you have more codes change this line to how many rows
you have).
170 This makes a nested for-next loop, using B as the variable from 1 to 10.
This is the column branch. (If you have more codes change this line to
how many columns you have).
180 This reads the codes from data into CODE$(A,B) or CODE$(ROW,COL)
190 This closes loop B
200 This closes loop A
210 This puts a random number into R. (If you have more codes you must change
the 10 to how many rows you have).
220 This puts a random number into C. You must change the 10 to how many
columns you have.
230 This make keys G,M,Y,R, change colours GREEN, MAGENTA, YELLOW, RED,
respectively
240 This displays at row 10, column 1 "What is the colour at:"
245 This displays at row 11, column 10 "row";r;" , column";c
250 This puts "WHAT IS THE COLOUR AT ";R&C into A$
260 This says A$(If you don't have voice synthesizer, delete.)
270 This accept and validates to only G,M,Y,R being entered, and puts the
code into variable CDD$.
280 This checks if the code input=the entrance code. If so, goes to Line 480
290 This adds 1 to the variable quit
300 This checks to see if you have got it wrong 3 times... if you have, it
goes to line 330
310 This says TRY AGAIN PLEASE
320 This goes to line 210
330 This says YOU DO NOT KNOW THE COLOR
340 This says GOODBYE
350 REM
360 This erases any previously stored programs in mem exp. If you don't have
mem exp. delete.
370 This loads in a set of numbers into mem-exp to return to title screen
(similar to BYE) If no mem exp., delete, and put END.
380 - 470 These are the codes stored as data.
480 This returns the correct colour codes to the characters used for your
programs.
490 REM
500 .....Start of your program

```



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RICHARD OWEN  
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This month I had two problems which I had to overcome. One is the TI BASIC manual, the other is just a programming hint.

Here goes:-

If you look at page 94 in the Users Reference Guide and examine line 190 you'll see that it is wrong. It doesn't look wrong at first, but type in the program, and you will realise that it IS wrong.

{The whole example routine is wrong! PB}

Line 190 reads:           B=Y\*1.6+12.2  
Line 190 SHOULD read: B=Y\*-1.6+12.2

And then after that it should work! (This might well have been put into the newer manuals, but it is not in mine)

Now, if you don't have a joystick, this routine may be for you!!!!

```
100 CALL CLEAR
110 CALL KEY(1,K,S)
120 IF S=0 THEN 110
130 ON POS+1("WERSDZXC",CHR$(K),1) GOSUB 110,160,190,220,250,280,310,340
140 CALL HCHAR(ROW,COL,42)
150 GOTO 110
160 ROW=ROW+1
170 COL=COL-1
180 RETURN
190 ROW=ROW+1
200 COL=COL
210 RETURN
220 ROW=ROW+1
230 COL=COL+1
240 RETURN
250 ROW=ROW
260 COL=COL-1
270 RETURN
280 ROW=ROW
290 COL=COL+1
300 RETURN
310 ROW=ROW-1
320 COL=COL-1
330 RETURN
340 ROW=ROW-1
350 COL=COL
360 RETURN
370 ROW=ROW+1
380 COL=COL+1
400 RETURN
```

Hopefully this does work, and by pressing the "WERSDZXC" keys you can control a little asterisk around the screen. (This is very limited, but you can adapt it for use with ANY program in BASIC or EX/BASIC!!!!)

I hope this information is of help.... Now someone out there reading this can help me, and then I'll print the solution in TI-LINES!!!!

The problem is to write a subprogram to enable a letter to be typed in (in BASIC) and, the character enlarged to 4 characters big (i.e. CALL MAGNIFY(4) in EX-BASIC), and then printed onto the screen at a user chosen position. (If no response is given to this plea, I'll display an algorithm of the problem next month!!!!!!)

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And that is it, till next month!!!!!!!

One more little bit of help (to be given this time!!!!) If there is anyone sitting computer studies this year at O level, if you get any problems, send them to me and I'll try to help.

RICHARD OWEN

(I have some questions: what routine in the GOSUB list caters for letter C; why does the subroutine at 370 duplicate that at line 220; and what will happen if you keep your finger pressed on an invalid key for a long time ? PB)

FICTION

-----  
DIS / VAR WARS  
-----

A tale of two CTs, adapted from two original stories in such a way as to make them both totally unrecognisable.

PAGE 1  
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It was indeed not a million light years away. In fact, it was in the marquee, and in the immediate vicinity of the blob of orange gelatine.

In the process of standing up to greet Syn The Sizer, the furry insect had accidentally poked a limb into the side of the orange blob. At the same time, one of his six wings had become stuck to the blob's upper surface. She was hotly protesting this unwanted violation of her person, although distracted temporarily by the task of counting and recounting Syn's fingers. As the insect managed to extricate himself, the blob finally realised that she couldn't count, and that Syn did indeed have ten fingers, thus dashing her hopes. However, remembering the furry insect's recent lascivious behaviour caused them to be undashed, and she protested, this time to Syn, about the insect's attempt to have his evil way with her while smothering her with one of his wings.

"I rather think that you are talking out of the top of your head" Syn responded.

"How could I ?" she replied, "The brute had his wing over both of my mouths...".

Continued next issue...

1. IF YOU PRESS(ENTER)OR CTRL(M)WITHOUT A PAGE(LETTER) OR RESELECT(R) PREFIX YOU WILL RETURN TO THIS WELCOME PAGE  
=====
  2. YOU CAN USE THE DATA CTRL SEQUENCES AS LISTED IN THE TE2 MANUAL. QUICK-REF-GUIDE PAGE.1 DETAILED PAGE.16-19  
=====
  3. EG. IF YOU WISH TO DUMP THE NEWS TO A PRINTER THEN LOGOFF DO THE FOLLOWING  
>A.PRESS RESELECT(R)AND ENTER. GOTO C  
>B.SELECT PAGE(LETTER)AND PRESS ENTER  
>C.OUTPUT(CTRL 2)PAGE TO THE PRINTER  
>D.REPEAT B AND C ABOVE TILL FINISHED  
=====
  4. EXIT. (LOGOFF)THE 4/ABC NEWS ANYWHERE SIMPLY TURN YOUR MODEM TO OFF-LINE! THEN CHECK PHONE FOR A DIALLING TONE  
\*\*THE REVIEW KEYS(PAGE 25)WILL STILL BE ACTIVE AFTER YOU HAVE LOGGED OFF!  
=====
- PRESS R AND ENTER FOR SELECTION PAGE

ENTER      4/ABC NEWS SELECTION PAGE  
=====

- A.      TEST PAGE ONE
  - B.      TEST PAGE TWO
  - C.      TEST PAGE THREE
  - D.      TEST PAGE FOUR
  - E.      TEST PAGE FIVE
  - F.      TEST PAGE SIX
  - G.      TEST PAGE SEVEN
  - H.      TEST PAGE EIGHT
  - I.      TEST PAGE NINE
  - J.      TEST PAGE TEN
  - K.      TEST PAGE ELEVEN
  - L.      TEST PAGE TWELVE
  - M.      TEST PAGE THIRTEEN
  - N.      TEST PAGE FOURTEEN
  - O.      TEST PAGE FIFTEEN
  - P.      TEST PAGE SIXTEEN
  - Q.      TEST PAGE SEVENTEEN
  - R.      RESELECT THIS PAGE
- =====

PRESS R OR PAGE LETTER AND ENTER

A.                      PAGE ONE

.....  
 . WOULD YOU LIKE TO FILL THIS PAGE  
 -----

WITH NEWS VIEWS OR INFORMATION ON THE 4A

DO YOU HAVE ANY HINTS OR TIPS TO PASS ON

MAYBE A QUESTION OR A PROBLEM TO PUT UP

ARE YOU LOOKING FOR ANY 4A ITEMS TO BUY

DO YOU HAVE ANY ITEMS YOU WANT TO SELL

OR DO YOU JUST WANT YOUR NAME(INTERESTS)

AND PHONE NUMBER PUT UP SO THAT OTHER 4A

USERS CAN CONTACT YOU IF THEY WISH TO

THEN CALL 4/ABC NEWS ANYTIME(NOT SUNDAY)

=====

PRESS R OR PAGE LETTER AND ENTER

-----  
S O R T I N G   A N D   S E A R C H I N G  
-----

P e t e r   B r o o k s

S e p t e m b e r   1 9 8 5

If you were given a small pile of 20 visiting cards, each containing just a surname, and you were asked to arrange them in alphabetical order, how might you go about it ?

You might lay the cards down in a line on a flat surface, and look through them for surnames beginning with the letter "A". Picking any out, you would place them in a separate pile. Then you would do the same for all the remaining letters in the alphabet, or until you'd run out of cards.

You now have a partly-sorted set of cards. You might now pick up the pile of cards containing surnames beginning with the letter "A" (or whatever the first letter had been), and spread them out, looking for surnames beginning "AA", "AB", etc., doing the same for all the piles until you had 20 "piles", each containing just a single card, all neatly sorted.

On the other hand, you might be less organised (or less pedantic), or you might have a much faster, shorter method.

The simplest sorting method for a computer however is probably the BUBBLE SORT. It is possibly the most-used, the easiest to write in BASIC, and the shortest. It is also probably the slowest. But it's as good a place as any to start.

There are different types of Bubble Sort, all variations on a theme. The "brute force" version compares everything with everything else, and as it has never really been a contender I will omit it from the discussion here.

The "bubble" name refers to the fact that the sorting method takes an entry (or "element") at the bottom of a list and compares it with the entry (element) which lies immediately above it. If the bottom entry is "less than" the one above, the two swap places. This process is repeated from the new position, and the effect is to cause entries to rise to their appropriate position rather like bubbles rising in a liquid. (It is possible to run the sorting process in reverse, and "bubble" from the top downwards, but that ruins the analogy!).

If you are a frequent watcher of bubbles, you might have noticed that sometimes they get stuck against the side of the container while rising, and it may take another bubble from below to help them on their way. A similar effect can be seen during the execution of a Bubble Sort if you examine the list as it undergoes sorting. Take this simple list as an example:

Z  
A  
P  
R  
B  
Q  
S  
O  
E  
T

It contains ten items (entries, elements), each of which is a single letter. To keep life simple there are no duplications.

The Bubble Sort compares the last item, "T", with the one above it, "E". "E" is "less than" "T" - it appears before "T" in the alphabet - so "E" and "T" remain in their respective places.

Move up one position. We are now looking at "E". Compared with the entry above it, "O", it is in the wrong position. Swap the positions of "E" and "O". This gives a new look to the list:

Z  
A  
P  
R  
B  
Q  
S  
E  
O  
T

Move up another position and we are looking at "E" again. Compared with the "S" above it, "E" is again in the wrong position, so swap places with "S". Again, the list changes:

Z  
A  
P  
R  
B  
Q  
E  
S  
O  
T

Move up another position. Once again we are looking at "E". Note how it is bubbling up through the list. In fact, it will only go as far as the next swap, since after swapping with "Q" it will not be "less than" "B".

Moving up another position after that swap we look at "B". It will bubble up as far as "A", and then "A" will bubble up one place to give a partly-sorted list after one "pass" through it:

A  
Z  
B  
P  
R  
E  
Q  
S  
O  
T

Now we go back to the bottom of the list and do it all again. After a second pass, the list looks like this:

A  
B  
Z  
E  
P  
R  
O  
Q  
S  
T

After a number of passes, the list is completely sorted:

Table I : "Standard" Bubble Sort Result

|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|
| Z       | Z | Z | Z | Z | Z | A | A | A | A | A | A | A | A | A | A | A | A | A | A  | A |
| A       | A | A | A | A | Z | Z | Z | Z | B | B | B | B | B | B | B | B | B | B | B  | B |
| P       | P | P | P | B | B | B | B | Z | Z | E | E | E | E | E | E | E | E | E | E  |   |
| R       | R | R | R | B | P | P | P | E | E | Z | Z | O | O | O | O | O | O | O | O  |   |
| B       | B | B | R | R | R | R | E | P | P | O | O | I | I | I | P | P | I | P | I  |   |
| Q       | Q | E | E | E | E | E | R | R | R | I | O | P | P | I | P | I | Z | I | Q  |   |
| S       | S | E | Q | Q | Q | Q | O | O | O | O | I | R | R | R | I | Q | I | Q | I  |   |
| O       | E | S | S | S | S | S | I | O | Q | Q | Q | Q | Q | I | R | I | R | I | R  |   |
| E       | O | O | O | O | O | I | S | S | S | S | S | S | S | S | S | S | S | S | I  |   |
| T       | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | T | I  |   |
| S       | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s  |   |
| Passes: | 1 |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   | 3  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 5  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 6  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 7  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 8  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 9  |   |
|         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10 |   |

S : Start

F : Finish

a - t : Swaps 1 to 20

Now comes the crunch. You and I can see that the list is sorted, but how would the computer know ?

There are probably many solutions, but the simplest involves the use of a FLAG.

In BASIC, a FLAG is a variable whose contents indicate whether something has happened.

Each time a swap is made, the FLAG is SET (we'll see how, shortly). At the end of each completed pass, the computer can then check the FLAG to see if it has been SET.

If it has, it indicates that AT LEAST ONE SWAP HAS OCCURRED, and it is possible that more may need to be performed. The computer therefore CLEARS or UNSETS the FLAG, and starts a fresh pass.

If however the computer completes a pass, checks the FLAG, and finds that it is still CLEAR or UNSET, this indicates that NO swaps were made.

And no swaps were made because the list was completely sorted.

So what's a FLAG, how is it SET, and how is it CLEARED or UNSET ?

We'll find out in the next article.

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PRINTING WITH THE TI99  
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By DAVE HEWITT

In response to Mr. Baird's request in volume 2 issue 3, I have decided to put pen to paper (or finger to keyboard) and try to unravel some of the mysteries surrounding printers and their connection to the TI99.

Firstly, there are two ways of transmitting information to be sent to a printer. These are Serial (RS232) and Parallel.

The Serial connection is the most common in use with the TI99 but many printers require optional interface boards to mount inside the printer to allow this type of input. The Serial connection transmits information as its name implies as a series of logic levels over a single signal connection. There is also a ground or 0V connection and 1 or 2 control lines to ensure that the data is only sent when the printer is ready to accept it. A 25 pin "D" connector is normally used for this. Usually only 3 or 4 pins are connected.

The second type of printer connection is Parallel. In this case data is 8 bits transmitted simultaneously along 8 separate wires. Here again there is also a ground or 0V connection and 1 or 2 control lines to ensure that data is only sent when the printer is ready to accept it. The most common connector for this system is a 36 pin "Amphenol" type plug. The term Centronics is often used to describe this type of connection and for most practical purposes Centronics and parallel interface mean the same thing.

There is a third connection available called IEEE488 but this is of no concern to the TI99 user as this is a specialized industrial interface.

Next question is what do I use? There is little to choose from between serial and parallel. Parallel can theoretically transmit data faster, but because we are talking about printers (which are slow even compared to TI BASIC), in practice the speed is limited by the mechanics of the printer and not the speed of the interface. The choice therefore between the two may be influenced by what printer you want or have and how much you are prepared to spend on the interface. (More of that later).

Most printers have a parallel input as standard but on many the serial input is an option for which you pay extra (e.g. EPSON FX/RX80). This is not always the case and some printers have only serial input.

Next the interface. An interface is required to connect the printer to the TI99 I/O port on the right hand side of the console. If you are going to expand your system with disk drives and extra RAM etc. then the best way to interface a printer is to use an RS232 interface card fitted into the expansion box. (You may need the expansion box for disk drives but this is another topic). If, however, you are not intending to expand your system then you will require a stand-alone interface that plugs directly into the I/O connector and the printer connects to this. Stand-alone units are available for both serial and parallel connections either from TI or other manufacturers. Serial units are available from TI and MYARC. Also a parallel interface is available from me. I believe this is the smallest (and cheapest) interface available, being slightly smaller than the TI99 speech synthesizer. The other interfaces, particularly the TI one, tend to be somewhat large.

The final point to add is the software to drive the printer. All of the TI99 peripherals contain a ROM (read only memory) that contains the software necessary to drive that peripheral. This is true of expansion box cards as well as printer interfaces. Therefore, you can access the printer from a TI BASIC program, an Extended basic program or from any cartridge that uses a printer. Of course, you can also LIST basic programs onto the printer for documentation or to aid program development.

I think that's all I can say on the topic. I hope this clears up a few queries. Please feel free to contact me if you are still mystified (or if you want one of my interfaces).

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C L O S E   F I L E  
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Once again TI-LINES is hitting the road so late it is colliding with the issue succeeding it. At the time of writing I cannot see an alternative to putting both September and October issues out together, which makes life awkward (as if it was not so already) but it may give me the breathing space that I need. This month has seen me travelling no less than 600+ miles in one week, coupled with a series of technical problems which have dragged into the mire my efforts to keep to any kind of timetable. This was followed by a temporary loss of almost all the files that I and Jenny Keane had produced ready for this issue, and I have been left with a strong feeling that Somebody Up There Doesn't Like Me...

Lots of goodies have been making themselves known to me, both directly and in some cases indirectly relating to the 99s. Some details are to be presented in the next issue, in order that the Editorial be kept to a reasonable size this time!

I continue to be bogged down with work in all spheres, forcing me to cancel any plans to appear on the pages of TI-EXCHANGE's TI\*MES, which means that I have not written anything for Clive and Audrey for almost nine months. Far from feeling forced to cut back on my activities, I feel compelled to actually increase them: there is a need for a specialist publication to circulate among those 99 buffs working, or thinking of working, on hard- and soft- ware for the machine, so that they do not work in isolation, and so that an opportunity is afforded for them to collaborate on ventures. I have been trying to think of a mechanism whereby interested parties can get together to discuss and plan, but so far without success. We are all spread too far apart, venues like the Show coming up in October are fine meeting points but we need two or three days of brainstorming, and the cost of accommodating everyone would be prohibitive. If anyone has any bright ideas - and most of them seem to be coming from OTIUsers, due entirely to our atypical composition - then I would be happy to listen to them. However, I think that we can rule out the possibility of a group booking at the nearest YMCA, and the hotels in Oxford are strictly for the nouveau riche.

Finally, GRAHAM WOLSTENHOLME, a non-OTIUser who advertised in V2.1, has asked me to convey his thanks and appreciation to everyone who contacted him. In fact, Graham has also passed me a copy of an article which he has submitted to TI\*MES, relating to the production of a 32K RAM expansion based on an Australian design, and I shall be publishing that shortly.

I hope to see some of you at the Birmingham Show,

Peter Brooks

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