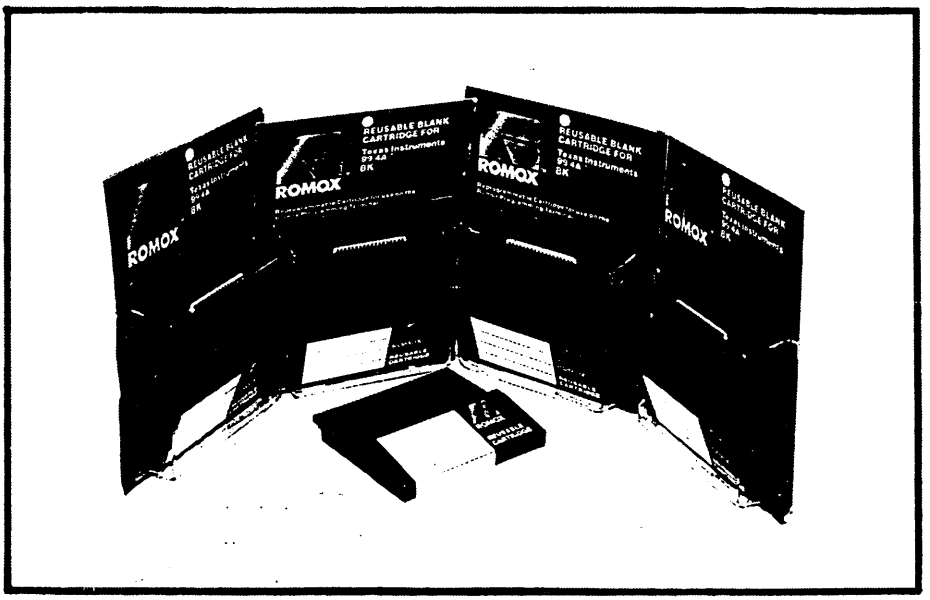
INTERNATIONAL TI-LINES

Volume 3, Issue 12 May 1st., 1987



Formerly OXON TI USERS

A PUBLICATION OF THE INTERNATIONAL TI USER GROUP

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)) T I M E T O R E N E W Y O U R S U B S C R I P T I O N ((

Index to articles Page

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* IF YOU WONDER WHY TI-LINES FAILS TO APPEAR THROUGH YOUR LETTERBOX IN JUNE, THEN PERHAPS YOU FORGOT TO RENEW YOUR SUBSCRIPTION !!! *

****

B A L D I E ' S   B U R B L E

SUBSCRIPTION RENEWALS ARE NOW DUE FOR MEMBERS OF THE INTERNATIONAL TI USER GROUP AND OF THE WEST MIDLANDS TI USER GROUP

This issue marks the last in Volume 3, and is the 38th to be produced by my own fair hand. It will be out before the result of the Derby meeting of TI-EXCHANGE is known, so if you really want to know what went on, you will have to resubscribe...

I have a stack of subjects lined up for 1987/88, so Volume 4 should contain more than Volume 3 has (the Fates permitting).

EDDY TURNER will be telling us how he battled against the elements, and against his Atronics printer interface, and came up trumps - with a working printer after some six months or more!

NEIL WILSON will be conducting an EXTENDED BASIC tutorial, and I hope to continue with my intermittent BASIC FOR BEGINNERS.

SCOTT and JO ANN will be continuing with their ADVENTURE HELP column, and JO ANN still has a couple of things to tie up for her WORD PROCESSOR tutorial.

COLIN HINSON has some hardware ideas up his sleeve (a hardware single-stepper is on the cards, I believe), and there will be hardware specials from MIKE GODDARD and BILL REED.

I hope to tackle some of the more esoteric (but nonetheless interesting) aspects of computing, such as CORE WAR, COMPUTER-GENERATED MUSIC (as well as TEXT and POETRY), FRACTALS and FRACTIONALS (with regard to graphics), more on SPEECH, and anything else that I come across.

I hope to complete the task of cataloguing the collection of PUBLIC DOMAIN software which I carry, and to continue to increase the list of useful disk-based utilities (as well as some of the cassette-based versions which may be available later this year).

We are still on the lookout for all sorts of bargains, whether as disks or as modules/cassettes/books, and I hope to be able to report progress on all sorts of projects over the coming year.

In that vein, I have some news which may be of interest. It is about something from the past which has relevence now and in the future.

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Few, if any, of the new owners of 4As will remember the ROMOX system of programmable cartridges which was proposed some years ago. The idea was simple: provide selected software retailers with a "software booth" and a sort of program dispenser, and sell programmable cartridges to a range of computer owners, and then get them to "rent" software by paying the retailer a fee, plugging their programmable cartridge into the booth, selecting the appropriate format (99/4 as it was then) and bingo! Lots of money!

The ROMOX system even got a look in on one of the TV computer programmes and I have a vague recollection of seeing it on Tomorrow's World.

To cut a long nostalgic story short (not least because the "rental" fee was as much as the software itself - around the £20 mark - and the cost of the cartridge was a similarly-ridiculous amount) through the kind (and much appreciated) efforts of TONY BOWDEN we now have a stock of those ROMOX cartridges.

Now, if you renew your subscription promptly (i.e., by the end of JUNE), I am offering the cartridges to you at 50p each (excluding the cost of post and packing) on a first-come-first-served basis. I have some stock with me, and if demand is high I can get more, but they aren't available to me for an unlimited period.

Note that each cartridge contains one soldered-in 8K 2764 EPROM (you won't be able to buy those chips at anything like 50p, let alone a whole unit consisting of circuit board and plastic case) which is BLANK.

If you have access to a suitable EPROMmer, you can modify it to take the cartridge edge connector and stick your own software onto it.

Otherwise, in the near future, when our own EPROMmer is completed, we will be offering to program it for you (for a reasonable fee, of course) and there is nothing to stop you buying several ROMOX units from me. (Some have already bought a dozen or so each!).

What advantage is there to owning such a cartridge ? Well, when you tire of the software which you currently have programmed into it, you can send it in and have it reprogrammed. If you have more than one such cartridge, you can keep your favourite software on two or three of them, and use any others you may have bought to experiment with other items.

If you find a program which doesn't strike you as worth keeping, you can have the cartridge reprogrammed with something else which might turn out to be of greater interest.

This service will ONLY be offered to holders of the 1987/88 ITUG subscription, in view of the limited numbers of units available, and the mutual support which ITUG and its subscribers give each other.

The cost of having a ROMOX unit programmed has not been finally decided upon, but will depend upon the type of software, the difficulty in producing it, and other factors. I do not expect the net cost to be more than £3.50 excluding post and packing.

If you want to put in an order (remembering the first-come-first-served basis of the offer) you can place one when you renew your subscription (or if you have already renewed, then either by post or by phone - the

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ITUG answering machine is available for your messages when I can't get to the phone). Remember that the cost of 50p per unit does not include post and packing, so do not write any cheques until you receive the full invoice. We may even be able to offer terminal software on them for those wishing to access the Bulletin Boards as they come online shortly.

Talking of Bulletin Boards, GORDON PITT of WEST MIDLANDS TI USERS hopes to be nearing the end of ironing the bugs out of the WMTI TIBBS with the able (and invaluable) assistance of COLIN HINSON and NEVILLE BOSWORTH.

This Board will run TIBBS until such time as the ITUG EYE is opened, which will depend upon how fast I can get the Operating System written!

The EYE system exists only on paper at present (but would probably have been under test by now if I'd got off my backside sooner) and will take some time to implement.

EYE is an acronym of Electronic Information Exchange (Y can often be substituted for I, and EIE doesn't have the same ring to it; nor can you say clever things like THE ITUG EYE IS NOW OPEN, or THERE'S SOMETHING IN YOUR EYE WHICH NEEDS LOOKING AT and similar witticisms...), and should provide a bells and whistles equivalent of a Bulletin Board.

EYE may have bitten off more than I can chew... Or do I mean I may have bitten off more than EYE can chew ?

Anyway, if you would like to access the WMTI TIBBS and take a look at what is presently available, contact Gordon on 0922 476373 for full details. For one thing, you will need special accessing software as well as a modem with 1200/75 baud facility; the software (called COMTTY) will shortly be available from me. (Note that VIDITEL/PRESTEL will not be suitable due to reliance on Prestel protocols.) For another, the TIBBS system is password based, so you will need to pre-arrange your access details with Gordon before you can even get on.

It will be best if you send Gordon your details BY POST (so that there is a written record, and errors are less likely). Provide him with the NAME which you will use to access WMTI TIBBS (e.g. EGBERT SPLODGERS) and MAKE SURE YOU STICK TO THAT NAME EXACTLY. Anything "similar" will not be recognised and you will be denied access. (When you first access the TIBBS, you will be asked to enter a four digit passcode - what TIBBS calls a password - which you can use as additional validation). You should NOT use control/graphics characters as part of your name, nor should you use initials. Use simply a forename and a surname separated by a single space.

The online times proposed now are: 9pm to 1am seven days a week.

A large response will result in re-examination of the online period to accommodate increased numbers.

If you want to try the system outside these hours, you must arrange it as a special case with Gordon.

Write to Gordon at 259, Sneyd Lane, Bloxwich, WALSALL, West Midlands, WS3 2LS.

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The WMTI National TI Users Workshop went very well - I wish that I had been able to make a tour of all the exhibits if only for my own education, but I was rushed off my feet the entire day. I am hopeful that photographs taken by several attendants will be available in this and future issues of the magazine. Another is planned for the middle of this year, and I do urge you to attend if you can. These Workshops are a rare opportunity for you to get "hands on" experience and advice from people who are very enthusiastic about the 4A. You can ask all sorts of questions on the phone or in letters, but when you do it in person you get a much more detailed response with probably demonstration of the answer as well on an available machine. The most important facet of a Workshop is that answers often generate further questions, and if you are face to face with your respondent you have a much more immediate feedback than you would get otherwise.

Don't get the impression that these Workshops are peopled by serious, scowling individuals who talk a jargon-filled language and whose brains operate on a plane above that of mere mortals. They are all Toms, Dicks, and Harrys (well, actually none of them as I recall were called Tom, and one was even called Jo Ann...), and they are happiest when they are passing on even simple advice to someone who has done them the honour of asking for their help.

I gather that the next Workshop may take place on a Sunday, which I know will free one individual who is chained to the store every other day of the week!

So, jump the gun, and tell Gordon you are coming to the next Workshop, rain, wind, or shine!

A little snippet of news came my way recently concerning superconductors which I thought I'd pass on, considering that the item is probably more important than the invention of the transistor.

Superconduction is an effect oberved at exceptionally low temperatures (-270C) when in certain materials all electrical resistance disappears. A superconductor is a material which exhibits this effect, and research has been going on for many years into discovering new materials whose superconduction occurs at higher temperatures.

The Japanese have recently been dismissed in a number of publications as being incapable of original thought or research (which is blatantly rubbish), and it has been Japanese research departments which have made the most astonishing advances in the production of high-temperature superconductors. In fact, they can reliably produce the effect at about -170C (liquid nitrogen) and have also been able to produce it for short periods at close to room temperature!

The Josephson Junction, about which I once wrote in TIDINGS, relies on this effect, as do a number of other important devices (Nuclear Magnetic Resonance Spectrometers, for one - and about which I have also written in the past), but they have all been hampered by the need for extremely heavy, and very expensive, cooling systems. The development of such superconductors (the most recent are described as ceramics, and although they are currently very brittle it is possible for them to be made into flexible products) opens the door to a massive range of improvements in

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a vast number of technologies. Even the ordinary mains wiring in the home, or the circuitry in electronic devices, could benefit from the use of resistance-free electrical conduction.

The use of superconducting components in even today's computers could result in a speed increase of the order of ten or even one hundred fold, and this is before we encounter the immensely more powerful technology which lies behind photonics - the light-based successor to electronics.

It is likely that photonics will find uses in data transfer, while the superconducting materials will be used in areas where previously huge amounts of energy would have been necessary to overcome resistance to the flow of electricity - for example, in maglev transport vehicles.

Incidentally, it has been the need for superconducting materials in the building of Japan's high-speed maglev trains which has been the spur for their development. Knowing the way in which new technological advances seem to experience inexplicable delays in implementation, it is likely to be some time before we see any real application of superconductors...

Thanks to Gordon (again), ITUG should shortly be able to offer a good deal on a 128K Standalone RAMCARD/PRINTER INTERFACE from MECHATRONICS. This is a well-designed unit which plugs into the right-hand expansion port on the console (and can have the PEB plugged into it in turn), and which offers 32K of memory expansion, 96K of RAMDISK (limited currently to holding a maximum of three files, but modifications have been proposed) and a printer interface. The initial cost before Customs take their bite will be around £75.

It is a marvellous opportunity for someone who wants to expand their system, but who cannot afford the cost of a PEB, 32K, disk controller, and disk drive. Using this expansion, with Extended BASIC (to make use of the 32K), a console owner can manipulate data/program files with as much ease and speed as with a standard expansion. It is possible to add a "normal" expansion system as well, so if funds/interest grew with time, the owner of a Mechatronics 128K unit could have the best of both worlds.

Contact Gordon for more details (he has a unit for demonstration).

I gather that we may also be able to offer a mouse as well (again, see Gordon for full details).

As this is the last issue in the current volume, it is appropriate that I should express grateful thanks to certain special individuals without whose greatly appreciated assistance TI-LINES would never get off the ground each month. JOHN MATTHEWS as always has been more than generous in allowing me access to his photocopier in order to produce TI-LINES and various fliers, etc., (even on one occasion inviting me to use the machine from 8pm to midnight - which I did). The improvements in quality of the magazine are largely due to his suggestions.

GORDON PITT, TREVOR DAVIES, and RICHARD SIERAKOWSKI have provided all sorts of support, from morale-boosts when necessary, to hardware or

>>>MORE>

software assistance, for which I am extremely grateful. Gordon in particular has been dashing round in a blur, obtaining contacts, and support from companies who would otherwise not have considered our efforts worth supporting. He has also found cheap sources of a number of materials and spent a large amount of time and effort in the interest of TI Users. Trevor has acted as unpaid chauffeur on countless occasions, and ferried us both to a number of venues. Richard has spent enormous amounts of time and money on overseas calls, and I gather has been instrumental in adding certain facilities to the new Myarc 9640. He is also nearing the completion of an EPROM programmer, which will be invaluable in the coming months.

SCOTT and JO ANN COPELAND have kept up a continuous stream of articles and even illustrations to act as fillers, providing a much-needed tutorial series on the TI-Writer/Funnelwriter, and an Adventure Help spot which has been reproduced in overseas publications, and which has apparently been avidly consumed (but only belatedly responded to!). Their efforts have not gone unnoticed, and ITUG appears to now have a reputation as a source of valuable Adventure hints.

COLIN HINSON has provided both an extremely learned series on the Disk DSR and assistance in a number of fields, and I only hope that he has obtained as much out of ITUG as we have obtained through him.

The list goes on and on, and it would take me an eon to describe the worthy efforts of a large number of ITUGers (like MARTIN ROSS, NEVILLE BOSWORTH, RICHARD BLANDEN, TONY BOWDEN, DAVID BAINES, DAVE HEWITT, BILL REED, MIKE GODDARD, etc., etc.) all of whom have contributed one way or another to the continuing existence of ITUG and TI-LINES, either by providing material for articles, or information leading to bargains in hardware/software/literature, or simply by acting as sounding boards for any crazy scheme which I might have come up with!

In this issue you should find some decent photographs (at last!) taken by JO ANN COPELAND at the Bloxwich Workshop. John Matthews kindly had Jo Ann's prints turned into a series of "screens" which should prove eminently suitable for publication, and which should avoid some of the tedious problems experienced in the recent past. I remember that some other Bloxwich attendants took photographs and promised to provide a few for publication; I look forward to featuring them in future issues.

2023 note: Sadly most of the photographs were printed as black rectangles with little or no content.... sjs

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This issue should also have an insert: the dreaded Questionnaire. I would be grateful if you would fill it in at some point (perhaps just before you send in a resubscription ?) so that I can use the information to guide the future content of TI-LINES.

I am also recompiling a CONTACT LIST. If you would like to become, or to continue as, a Contact (which I must emphasize DOES NOT REQUIRE YOU TO BE AN EXPERT!) please let me know, together with your full details (including phone number if you are willing to be available by phone) and some indication of the subjects in which you are especially interested.

Thank you for your help over the last year, and for your support: it is as always, greatly appreciated and ITUG could not continue without it.

>>END

ADVENTURE HELP

by: Scott and Jo Ann Copeland

ADVENTURE No. 11 - SAVAGE ISLAND PART II (Advanced Level) - GOOD LUCK ON THIS ONE! YOU'LL NEED IT!

I'm stark naked! / My lungs explode into a red, bubbling ruin! / ARGH! / ASPHYXIATED! / Thick-headed / My brain is fried! / I fainted. / EXPLOSION! / Hurricane winds suck me into outer space! / I quickly freeze to death! / Mankind, the world's greatest hero, now rests in the body of a prehistoric caveman.

VERBS:

ASK	EXHAle	LOOK	RUN	TEAR
AUTO	FEEL	MOVE	SAVE	THINk
BREAthe	GET	OPEN	SAY	TIE
CATCh	GIVE	PICK	SCORe	TO
CLOSe	GO	PRESs	SEE	TOUCh
CRAWl	GRAB	PULL	SHUT	UNDO
CRUMble	HELP	PUNCh	SMASh	UNRAvel
CRUSh	HIT	PUSH	SMELl	UNTIe
DESCribe	HOLD	PUT	SNIFf	USE
DRAG	HYPErventilate	QUIT	SPEAk	WALK
DROP	INVEntory	READ	TAKE	WEAR
EAT	JUMP	RELEase	TALK	WITH
ENTEr	KICK	REMOve	TASTe	WORK
EXAMine	LEAVe	RIP		

NOUNS:

ANY	CAVE	END	INVEntory	ON	SLIDe
ATOM	CENTer	ENGIne	ITSELF	OUT	SLOW
ARGH!!	CLOTh	EYES	LEVEr	OUTEr	SOUTh
BAG	CONSole	FASTen	LIFE	PASSword	SPACe
BALL	CONTrol	FIELd	LIGHt	PLANt	THREad
BANDanna	CORPse	FLOWer	LOOP	PLATform	TREAdmill
BLOCk	CRATes	FREE	MACHinery	PICTure	TUNNel
BLUE	DEEP	GAME	ME	PIRAte	UP
BOX	DEVIce	HANDle	MEDIcine	RAILing	VIEWscreen
BOXEs	DIAL	HANGing	METAl	RED	WAFEr
BREAthe	DISPlay	HOLE	MYSElf	ROOM	
BUTTon	DOWN	HYDRoponics	NEANderthal	SELF	(Passwords
CASE	EAST	IN	NORTh	SIGN	left out)

A little help in this Adventure: You'll need to Hyperventilate; Close your eyes; Perform Psychotransfiguration; Use your Rayshield; Tie bandanna in a loop; Drop loop in rooms; Play on the treadmill; Fix the flickering force field; Send the block to Earth; Find the RoboPirate; Say a password (probably more than one and more than once!) GOOD LUCK!
››END

L E T T E R S

Received from JOHN RICE after the Bloxwich Workshop:

Dear Peter,

Just a note to say I enjoyed the Workshop on Saturday - not least for the success of my "instant sale"! It was very encouraging to see the new German developments in particular.

You may want to pass on the following information, which appears in the April 1987 issue of COMPUTE!:

TI-99 FORTRAN! 100 TIMES FASTER THAN BASIC!

STRUCTURED IFs, DOs, MORE!

Send $49.95 to:

LGMA Products, Box 210, RD4, Coopersburg, PA 18036

Do Americans go in for April Fools Day jokes ?!

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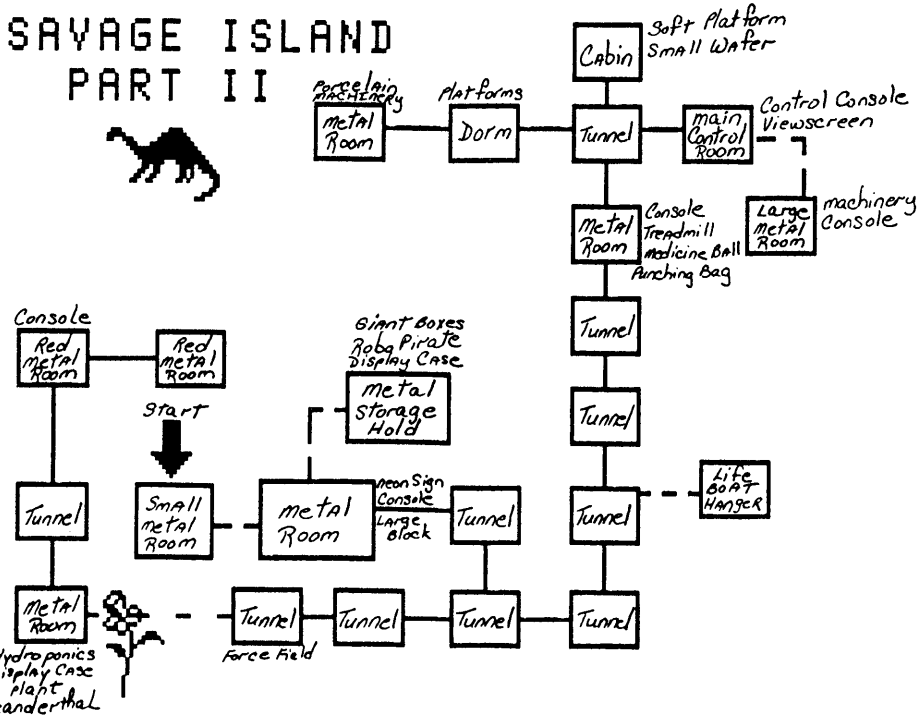


+ + + WORD JUMBLE # 1 ANSWERS + + +

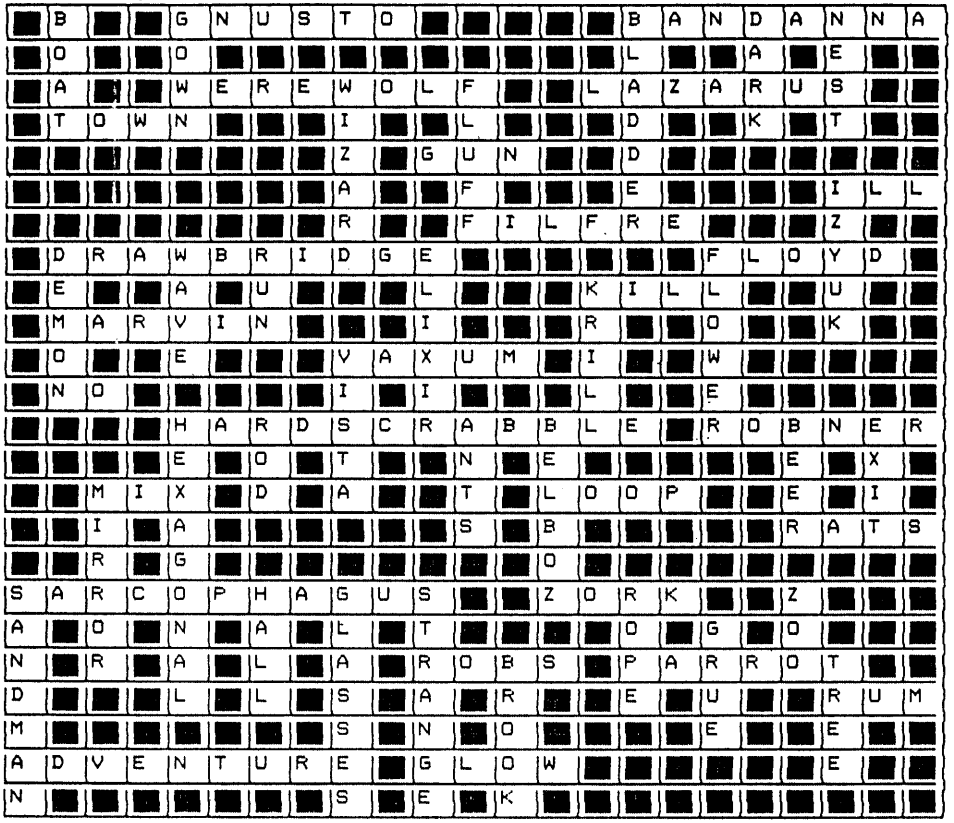
FOR COMPUTER USERS: +

N A L A G O	A N A L O G
O P M C U R E T	C O M P U T E R
T B E Y	B Y T E
H C P I	C H I P
E C M C P S O I O O S R R R	M I C R O P R O C E S S O R
B N Y R I A	B I N A R Y
I T B	B I T
O R P R G M A	P R O G R A M
A I F M R A E M N	M A I N F R A M E
I D K S	D I S K
S T R A O W F E	S O F T W A R E
E E L A P P H I R R	P E R I P H E R A L

FOR ADVENTURERS: +

T P A R I E	P I R A T E
E O E G G R O R R B E N	G E O R G E R O B N E R
R L L K I	K R I L L
O N N J H Y R D E	J O H N N Y R E D
O E L I P N T A	O L E P A I N T
O Y S P C C L	C Y C L O P S
B B T R U L T G A E S E A B T	B U G B L A T T E R B E A S T
E T N P Y H H S	N E P H T H Y S
F D Y L O	F L O Y D
E E R R J A	J E E A R R
C I U R N N O	U N I C O R N
V N U A E E R D T	A D V E N T U R E

<<<<<<<<<<<<<<ADVENTURE CROSSWORD PUZZLE #1 ANSWER GRID>>>>>>>>>>>>>>



Q U I C K I E

```
FOR I=1 TO 200 :: PRINT T$(I):: FOR S=0 TO -1 STEP -1 :: CALL
KEY(0,K,S) :: NEXT S :: NEXT I
```

How CALL KEY can be used with a simple FOR-NEXT loop to perform a keyboard scan in Extended BASIC:

S = 0 to -1 STEP -1

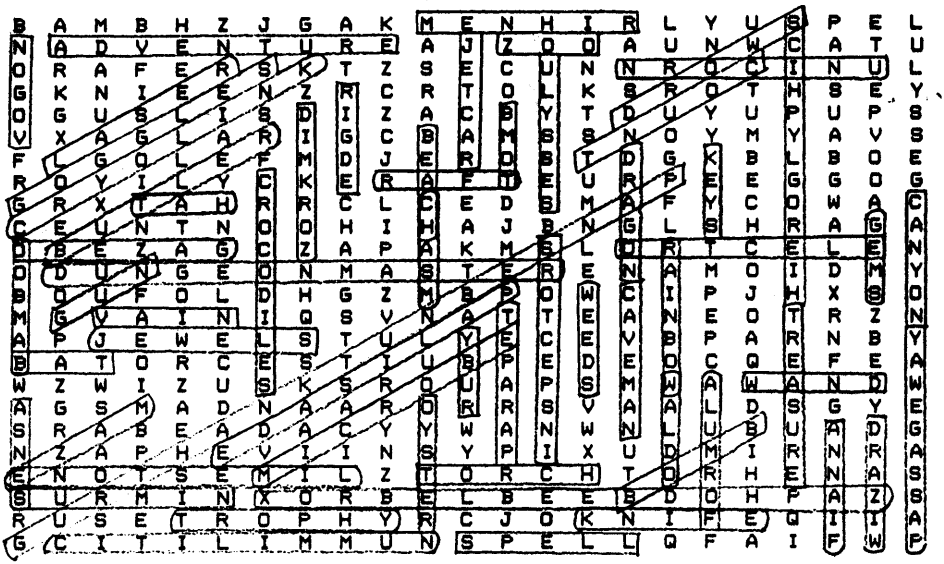
will exit the S loop when a key is pressed

S = -1 TO 0

will exit the S loop unless a key is pressed

Might be useful for examining the contents of an array during a debugging session in the Immediate mode.

Adventure Word Search # 1 Answer Grid



EAR 99'ER

East Anglia Region

User's Group

TI-99/4A

13 Elm Walk
Lakenheath
Suffolk, England
IP27 9QR

Eriswell
(063881)
3457

Scott and JoAnn Copeland

****MEETING: MAY 28, 1987****

6:00 PM 13 Elm Walk

Coffee/Tea/Snacks

Call or Write for Info

If you feel 'left out' due to being quite a distance away from other User's Groups, feel free to contact EAR 99'er - covering the East Anglia Region - and prepare to get an EARful of information on the TI-99/4A!

Coverage will include:

1] Information on new releases
2] Information on Public Domain releases
3] Adventure hints (or maps)
4] Hardware/Software coverage
5] Chit N' Chat (letters from subscribers)
6] And lots more (depending on your inputs)

Why not contact us as soon as possible? You never know what you might discover by becoming a member!

[This notice is NOT to detract from other User's Groups - and please don't cancel any current subscriptions! However, if you want to be included in the East Anglia Area let us hear from you!]

Write or call: Scott or JoAnn Copeland - we look forward to hearing from you!

a

Sean O'Brien with a Geneve 9640 in front of a TI99/4a keyboard.
Sean later went to live and work in Japan, and then in the USA.

f

e Colin Hinson (of TI UK)

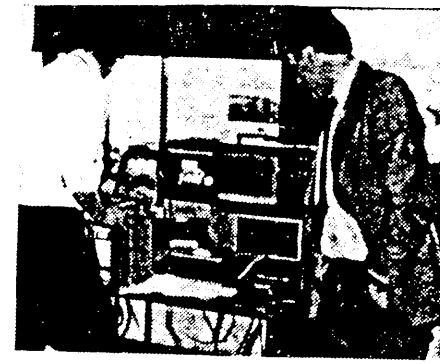
BLOXWICH 87

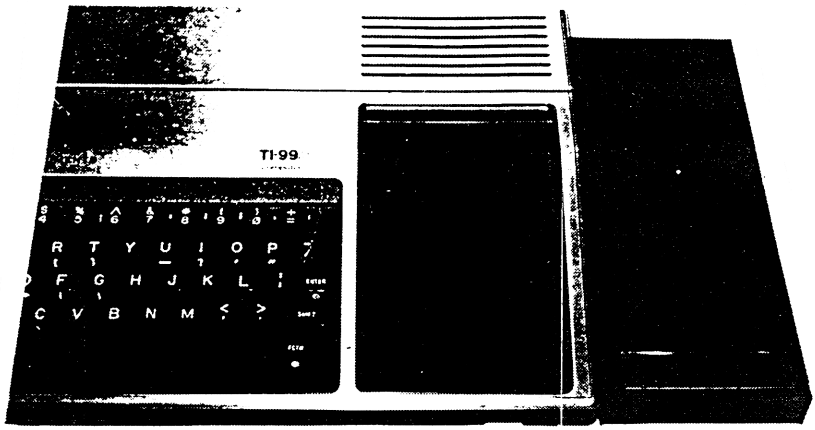
h

Peter Brooks

Colin Hinson

i j





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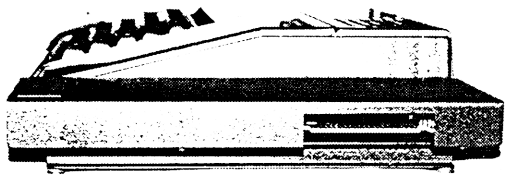

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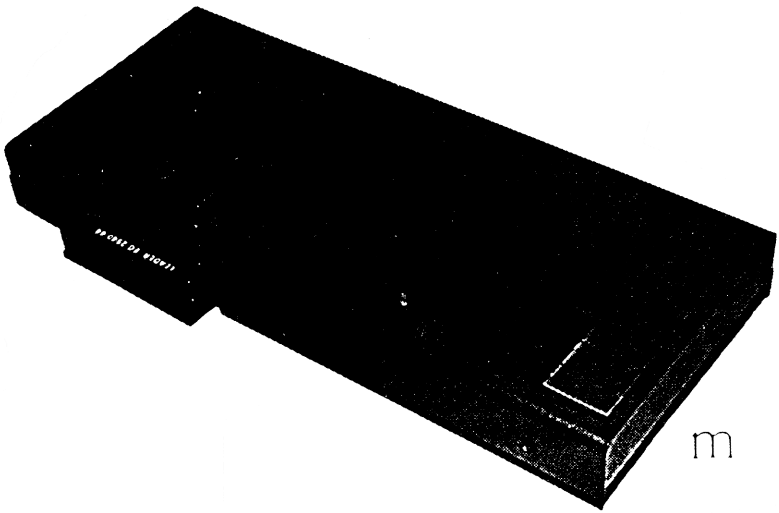

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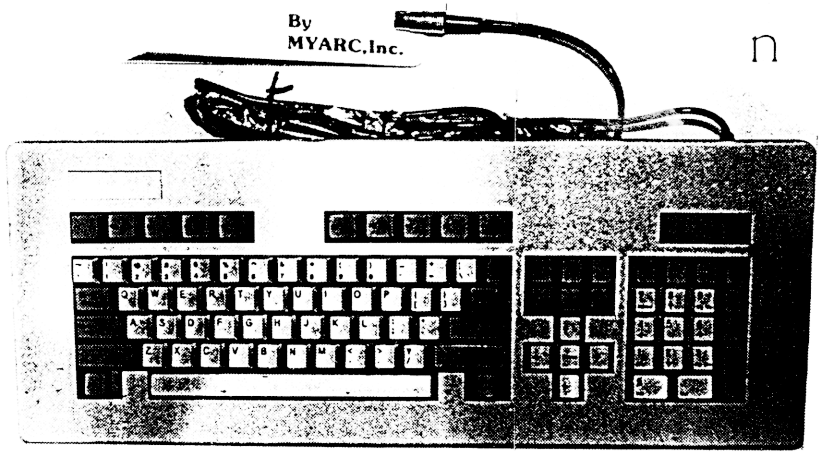
By
MYARC,Inc.



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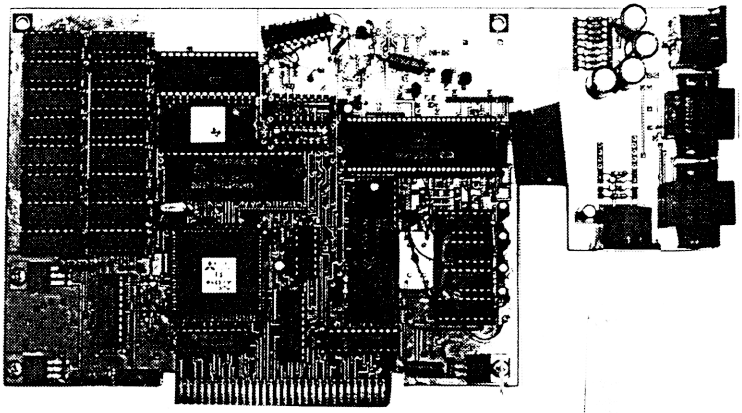

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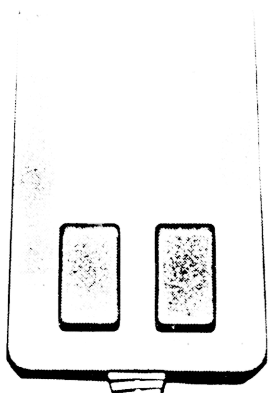

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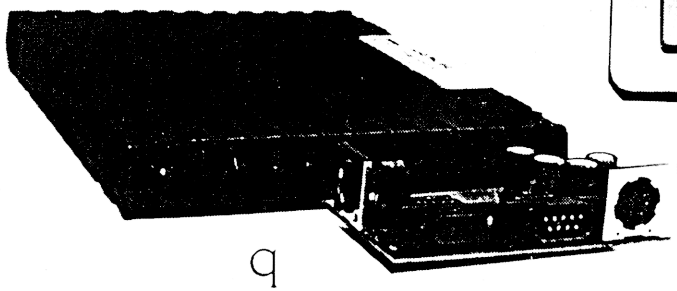

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I T U G   P H O T O C A L L : L E G E N D S

PAGE 15: THE BLOXWICH WORKSHOP (photos by JO ANN COPELAND)

(a) A first look at the MYARC 9640 for Sean O'Brien and the shadow of Russell Blatcher

(b) Stan Dixon and Phillip Marsden join those who heard John Rice say he had something for sale

(c) Ted Serwa (Cortex Users President) and Howard Greenberg chatting in front of the ETI project machine

(d) Martin Ross and son Christopher exchanging views on sale items

(e) Colin Hinson obscures all but the back of Richard Blanden's head while Russell Blatcher watches the photographer

(f) Light bouncing off Ol' Baldie's pate while he expounds the theory of Life, The TI, and Everything to Trevor Taberner, Stan Dixon, Chris Ross, and others

(g) Trevor Davies offers the photographer a full frontal while Eddie Carter debates robbing a bank to buy a PEB. Richard Blanden gets the front of his head photographed this time, while Richard "9640" Sierakowski propounds Geneve ownership. Ol' Baldie even manages to get his pointed finger in on the act

(h) Aha! A full frontal of yours truly demonstrating how to swivel in a chair without losing even more hair. Richard Sierakowski chats to another prospective 9640 owner

(i) A thoughtful Colin Hinson with Phil Marsden in the background

(j) Agh! The Bald Coot again, this time demonstrating to David Armer how to open an unsealed box. Note the spaghetti dangling down from the table!

CENTRE PAGES: Mechatronics 128K RAMCARD and MYARC 9640 PERSONAL COMPUTER

(k) The Mechatronics standalone 128K RAMCARD/PRINTER INTERFACE in situ

(l) View showing the RAMCARD's standard TI edge connector to which a PEB might also be attached

(m) A three-quarter view of the RAMCARD

(n) The MYARC 9640 keyboard with cable to connect to the card

(o) The 9640 card with its outer garments removed

(p) The Myarc mouse

(q) View of the 9640 card external connectors

>>END

B U L L E T I N   B O A R D

WANTED / 4 SALE / WANTED / 4 SALE / WANTED / 4 SALE / WANTED / 4 SALE /

NIGEL CLEMONS has a long list of things for sale. He hasn't quoted any asking prices, only the purchase prices when new, so you really need to know how old each item is and in what condition. Anyway, contact Nigel on COVENTRY (0203) 504254 and make your offers:

DESCRIPTION:	R R P
NAVARONE WIDGIT CARTRIDGE EXPANDER	£ 39.95
MINIMEMORY CARTRIDGE	£ 65.00
HOUSEHOLD BUDGET MANAGEMENT CARTRIDGE	£ 25.00
PERSONAL RECORD KEEPING CARTRIDGE	£ 25.00
BUCK ROGERS CARTRIDGE	£ 19.95
TI INVADERS CARTRIDGE	£ 19.95
PARSEC CARTRIDGE	£ 19.95
VIDEO CHESS CARTRIDGE	£ 39.95
HITCH HIKERS GUIDE TO THE GALAXY DISK	£ 39.95
MILLERS GRAPHICS EXPLORER DISK	£ 24.95
MILLERS GRAPHICS ADVANCED DIAGNOSTICS DISK	£ 19.95
DISPLAY ENHANCEMENT PACKAGE DISK	£ 20.00
TERMINAL EMULATOR II CARTRIDGE	£ 39.95
TERMINAL EMULATOR PROTOCOL MANUAL	£ 10.00
EDITOR/ASSEMBLER CARTRIDGE DISK AND MANUAL	£ 65.00
EARLY READING CARTRIDGE	£ 25.00
SOFTWARE DEVELOPMENT BOOK	£ 20.00
INTRODUCTION TO ASSEMBLY LANGUAGE FOR THE TI BOOK	£ 16.95
INITIATION INTO THE TI-99/4A ASSEMBLY LANGUAGE BOOK	£ 11.95
PROGRAMMING BASIC WITH THE TI HOME COMPUTER BOOK	£ 12.00
ASSEMBLY LANGUAGE ON THE TI-99/4A BOOK	£ 11.95
DR DOBBS TOOL BOOK OF FORTH	£ 22.95
STARTING FORTH BOOK	£ 22.95
THINKING FORTH BOOK	£ 14.75
FORTH PROGRAMMING BOOK	£ 15.50
THE 9900 FAMILY DATA BOOK	£ 16.00
GETTING STARTED WITH THE TI-99/4A BOOK	£ 5.95
GAMES WRITER PACK 1 AND 2 CASSETTE AND BOOKS	£ 5.00
51 FUN AND EDUCATIONAL PROGRAMS CASSETTE AND BOOK	£ 5.00
16 BIT MICROPROCESSORS BOOK	£ 11.70
HOW TO BUILD YOUR OWN 16 BIT MICROCOMPUTER BOOK	£ 4.95
50W SWITCH MODE PSU +5V 6A +12V 2.5A -5V .5A -12V .5A	£ 55.00
THE SMART PROGRAMMER BOOK	£ 10.00
SMART PROGRAMMING GUIDE FOR SPRITES BOOK	£ 6.95
SPECTRAVIDEO JOYSTICK AND TI ADAPTOR	£ 15.95
PROGRAMMING AIDS 1 CASSETTE AND MANUAL	£ 10.00
PROGRAMMING AIDS 2 DISK AND MANUAL	£ 10.00
PROGRAMMING AIDS 3 DISK AND MANUAL	£ 10.00
MINIDISKER DISK	£ 10.00
TOAD GRAPHICS CASSETTE	£ 5.95
EXTENDED BASIC GRAPHICS PACKAGE CASSETTE	£ 7.95
WINGING IT/SPACE RESCUE 2 CASSETTE	£ 8.00

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OCTAL 1/KEYS TO THE CASTLE CASSETTE	£ 8.00
AUTO SOUND UTILITY CASSETTE	£ 7.95
GRAPHICS CREATOR CASSETTE	£ 5.00
MUSIC SYNTHESISER CASSETTE	£ 10.00
STARPROBE 99 CASSETTE	£ 5.00

Nigel says that all offers will be considered.

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JOHN RICE tells me that in his haste to get to the Bloxwich Workshop he left home without a couple of things he intended selling:

PROGRAMS FOR THE TI HOME COMPUTER (STEVE DAVIS)	£3.00
26 ISSUES OF NATIONAL NINETY-NINER MAGAZINE (V1,2,3 (1-6))	£8.00

Contact John on 061 793 9652.

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I have been passed an EXTENDED BASIC module, a TE2 module, and a SPEECH SYNTHESIZER to sell. The asking prices are £27, £17, and £18 in order, and the prices do not include the cost of post, packing, and insurance. Contact me on the usual Oxford number (and talk to the answering machine if I am indisposed!).

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STEPHEN SHAW has some notes and requests:

"The disk library grows like Topsy and I am having difficulty keeping a listing on one disk. 36 disks of RLE pics just in, to be sorted through and duplicates and weak ones weeded out. Why not send a blank disk and return postage for the latest listing ?

Would you like a binder for TI-LINES ? The Philatelic Bureau publish a magazine for stamp collectors in A5 size and they also sell BINDERS for them. Intended for 24 issues of their mag, they neatly hold 12 issues of TI-LINES. Call in at your local philatelic counter for a look - they cost about a fiver apiece.

Does anyone have a spare copy of the SMART PROGRAMMER, Vol. 2, issue 3 for sale ? Needed to keep the collection complete. Will return a photocopy of the issue to you if you wish - I need the original for binding.

I should be grateful to receive on disk any third party software NOT sold by STAINLESS SOFTWARE which is NOT currently on sale. I cannot afford cash, but will happily send a disk of Stainless Software games back in return - up to five disks, after thatwe start talking!

Before you throw any material out, let me give it house room - books, magazines, newsletters, T shirts, anything. Postage can be covered on the FIRST copy of any title only, so drop a line before sending anything too heavy. Modules are welcomed by Peter Brooks (if you are throwing it out why ask for money - better it is used, no ?"

Contact Stephen at 10 Alstone Road, STOCKPORT, Cheshire, SK4 5AH.

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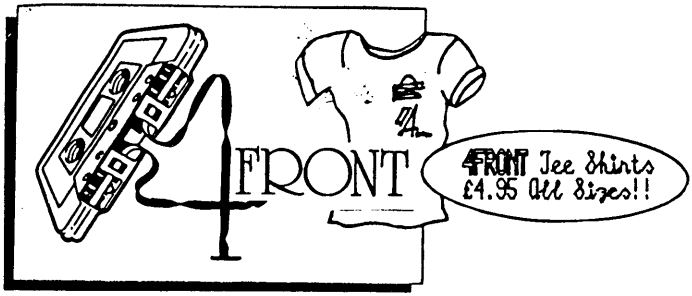

New Day Computing
Jerrard Close
Honiton
EX14 8EF

(0404)41856

A Letter to all 4FRONT Subscribers

Yes, well you don't need me to tell you that deadlines have been missed! A combination of factors have caused the delay - I can only say a hearty THANKYOU to you all for your patience. I know that in your shoes I for one would probably be hopping by now....

Well, what happens next? Most of you subscribed for a year, and will be wondering whether to renew. The quality of the product is apparently not in question, rather the chances of its survival in a market that has long since 'peaked'. This note is to let you know exactly how I stand, in order to help you make your own decisions. In a nutshell, I don't give up that easy! My own love affair with the Texy, and the number of you that seem to like 4FRONT leave me little choice. However, it would be foolish to think that things haven't changed.

Firstly, it would not be fair to offer subscriptions any more, since the future is unpredictable. Rather than pocket your cash and then risk letting you down, it only seems fair to take orders for one issue at a time.

Secondly, having completed a year, and being able to review the viability of 4FRONT, it is clear that it has been underpriced. If we all learn by mistakes then I should soon qualify for Mastermind. Seriously though, the price must change, and I know that in so doing I may lose some of you. For that I am sorry, but I am cheered by the fact that the majority of you will understand and stick with it. It's very hard to price a product that has no competitor because it is unique.

Lastly, and vitally, the future success of 4FRONT depends on the level of input from YOU in the way of letters, programs, hints, tips etc.

Well, that's about it - let me take this opportunity to say a huge 'Thankyou' for your past loyalty, and to invite you to step with me into the future.

Yours 4Afully,

Hairy Harry from Honiton

TAPE VERSION: £6.99 PER ISSUE (UK), £8.99 OVERSEAS
DISK VERSION: £7.99 PER ISSUE (UK), £9.99 OVERSEAS

WORD PROCESSING

by JO ANN COPELAND

I've been sitting in front of my TI console for 6 minutes now, just watching my cursor blink and blink. I do believe writer's block has hit. (I'm getting used to your applause out there!) Oh well, let's get moving right along...

Odds and Sods left out of previous articles... Shouldn't be too hard to cover, but maybe a little harder to follow...as I may usually know what I'm talking about, but getting it into words is something different!

Our first odd bit left out was 'Printing part of a text buffer'. We had learned how to type a letter, save it, then go to the Formatter to print it out. We also learned we could print out through the Editor with PrintFile where our printed document could be produced showing the line numbers also. However, if you wanted just part of your document to print out, without line numbers, select PrintFile in Command Mode.

Type the line number of the first line you want printed, space once, type the line number of the last line you want printed, space once, and then type in your printer devicename. Press Enter. If your printer is on, your lines should print out. I say that because half the time I'm waiting impatiently for something to print out, and after minutes pass I realize my printer can't print when it's not turned on!

(Don't snigger - I know I'm not the only one to do that! - or am I?)

Many moons ago we also discussed printing through the Formatter, but I don't believe I mentioned how to stop printing once in progress. If you find your paper gets hung up, or you're printing the wrong file, etc., just press FCTN 4 - the old reliable 'STOP THE PRESSES' command. Press ENTER to return to your screen or command mode (depending where you used FCTN 4).

{Note that FCTN 4 may still leave characters in the buffer set up to serve your RS232/PIO, so you should treat subsequent PrintFile commands with some caution. If you do not intend continuing (which is not as straightforward as it might seem) it is better to clear the buffer by instructing the printer to print a blank line from your text, or you may find unwanted characters corrupting your next attempt to print. Use PrintFile and specify the same line number twice - e.g. 0 0 PIO - or whatever your devicename might be. PB}

Now, this will get everyone's attention. A note on 'Stripping' - only this Stripping involves Stripping out Control Characters before printing. If you have a file in text with control characters, such as underline, overstrike, special character mode, etc., you'd find they

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would execute when you enter Command Mode and PrintFile in the Editor.

If you'd like to strip these out, enter Command Mode, select PrintFile (PF), Enter. Type C and space once. Now, type your devicename and press Enter. Your text should print out, but will NOT respond to any control characters.

You can also print in Fixed 80 format. Why? I don't know - but you can. Enter Command Mode, select PrintFile and Enter. Type F once and space once. Type in your printer devicename and press Enter. Your text will be printed in Fixed 80 Format.

{The FIXED 80 format is not really designed to enable output to a printer, but rather to a disk file. The F option allows you to create DISPLAY FIXED 80 files, or to successfully edit the same, so that you can read an OBJECT CODE file, modify it without needing recourse to the Editor from the Editor/Assembler, and then "save" it back out to disk in its original file format through the use of F with PrintFile. PB}

We also discussed Moving, Copying, Deleting, and using Find String and Replace String. (Everyone pull out your back issues and remind yourselves!) We can also move, copy, and delete PARTS of a line. And we can also use FindString and ReplaceString in columns...

Moving part of a line:

In Word Wrap Mode you would start with Insert Character (FCTN 2). Separate the line into two lines. When this is executed, use Reformat (CTRL 2) to join your text again.

In Fixed Mode you would find the line of which you want just part. Move all your lines except this line. Copy it and delete the part you don't want. You now have left your partial line that you wanted.

Copying part of a line:

In Word Wrap Mode you again use Insert Character to split the line. Copy it, and use Reformat to join your text.

In Fixed Mode you copy all the lines including your partial line. Delete any unwanted portions from the original and you are set.

Deleting part of a line:

In Word Wrap Mode you can use Delete to End of Line or again use Insert Character to split the line and delete what you need to. Then Reformat to join up.

In Fixed Mode use Delete Character or Delete to End of Line to delete any unwanted parts of the line.

Now, remember Find String? We used it in examples in a regular text. But you can also use it in Columns. In this, a specified range of columns is searched. Enter Command Mode, select FindString and press Enter. Type in the column number of the first column to be searched and then space once. Then type in the column number of the last column to be searched and space once. Then type in the string enclosed in slashes. Press Enter to have the computer do its thing.

>>MORE>

eg: 3 6 /Hobbies/ >> FindString will search between columns 3 and 6 for the word 'Hobbies' in the file <<

You can also specify a particular column to be searched for a particular word and have that word replaced using Replace String.

Enter Command Mode and select ReplaceString. Press Enter. Type in the column number of the first column to be searched, space once, type the column number of the last column to be searched, space once, and type in the old string and new string. Remember your slashes.

eg: 3 6 /FCTN/CTRL/ >> Replaces the word FCTN with CTRL between columns 3 and 6 <<

Remember - Replace String works fine in Word Wrap Mode and will wrap or fill in to fit your new word. In Fixed Mode, however, you find a different story. If you replace a word with a longer word watch your 'end of line'. It may get cut off depending on how many letters it was pushed over to fit in your new word.

Getting into Dot Commands... when you investigated Transliteration you found you typed in one code but it printed out as something else through the Formatter. I didn't mention that the number eight (8) acts as a 'backspace'. I usually use this to get a slash (/) through my zero (0). This only helps me when I want to distinguish between a zero and the letter O. So, if I were in text I would type the following:

```
eg:  .TL 48:48,8,47   >> 48 = the number zero (0)
                      >>  8 = backspace on my printer
                      >> 47 = the slash
```

My zeros would now print out with a slash through them. As, 48 (0) equals 48 (0), backspace, slash.

Another Dot Command is the .CO t Comment Command. If a Comment Command is put into your text it will NOT be printed out. This comment can be up to 76 columns (characters) and can be used to enter anything like a Revision Date or whatever other relevent information you might need.

Another Dot Command - .ML f = Mailing List in the Mail Merge Option. (Thought we were over that, did you?) (Bad thoughts have a way of coming back to you again!) This command calls the value file 'f' from a main text file. This can be used only once per file and the Formatter ignores any Mailing List commands after the first one.

Yet another Dot Command - *n* = Alternate Input - *n* can be any number from 1 to 99. The maximum length is 28 columns (characters). So, if you have listed in your text *1* in a paragraph, *2* in another paragraph, *3* in another paragraph, etc., you can just type in the information when necessary through the Formatter. Remember, it will prompt you when the value comes up.

Enough of Dot Commands... Another little bit left out is 'Printing a file to diskette'. A file can be output from the Formatter to a Diskette instead of to the printer - just enter a valid filename in answer to the prompt ENTER PRINTER DEVICENAME. If you do this, however, you can NOT print this file out the next time through the

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Formatter. You instead use the Editor with the PrintFile command by giving the Editor the devicename of the printer.

{Well, actually, you CAN print it out, but as it is likely to have large numbers of Line Feeds, Carriage Returns, and sundry other control characters, you'll probably waste a lot of paper/disk space to no useful purpose. PB}

READING OTHER PROGRAMS' MAIL (isn't that a felony?):

Have you ever been in the Editor creating a text or file and used ShowDirectory? You probably saw files that had the attribute of DIS/VAR 80 next to the file name. This may denote that the file may have been created using the TI-Writer/Funlwriter and you can load it up and read it using the TI-Writer/Funlwriter. TI-Writer/Funlwriter can also read some files produced through the Editor of the Editor/Assembler module, as this also stores files in DIS/VAR 80 and DIS/FIX 80 format.

Multi-Plan also uses this format, and files created by it can be read with the TI-Writer/Funlwriter. However, files created by TI-Writer/Funlwriter can NOT be read by Multi-Plan. Cheap!

A program written in TI Basic or Extended Basic can read and write TI-Writer/Funlwriter diskette files. However, you can not use TI-Writer/Funlwriter to create or edit program listings which TI Basic or Extended Basic can load and execute directly.

{I believe that there is at least one utility at large which allows you to create/edit a DIS/VAR 80 file using TI-Writer/Funlwriter which can be a listing for BASIC or EXTENDED BASIC, and then use the utility to convert the "listing" into a "merge format" file (DIS/VAR 163), which can subsequently be loaded into memory and resaved as an executable program file. PB}

Well gang, the only thing left to cover is Error Messages (of which I get a lot), Problems (same again), and a Quick Reference Listing. This means - YES - WE'VE FINISHED THE TUTORIALS ON TI-WRITER/FUNLWRITER.

Anyone who has managed to follow my ramblings-on up to this point, and did it successfully, is to be CONGRATULATED! You can now consider yourself a graduate (with certificate upon request) of the JO ANN COPELAND SCHOOL OF WORD PROCESSING!

If you have any questions, or a particular area you would like discussed further (or in more detail) please feel free to let me know. Anyone who knows me realizes I love to write (and talk) - even if it's not on a relevant issue! So, let me know... letters and calls welcome:

Jo Ann Copeland
13 Elm Walk
Lakenheath
Suffolk, England
IP 27 9QR


****
(What follows is a listing of error messages, problems, etc. If you're totally infatuated with the Word Processor read on - if you're totally smart - you'll go and have a cup of tea!)
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))MORE)

ERROR MESSAGES (MAY APPLY TO TI-WRITER ONLY) ((((((((((((((((((((((((((

Disk Errors	Meanings:
0	Disk Controller Peripheral not turned on or not connected. Diskette may not be initialized.
6	No Program Diskette in Drive 1; diskette is upside down in the drive; disk drive not turned on.
7	Program Diskette not in Disk Drive 1.

IO ERROR CODE	Meanings:
00	An illegal use of LoadFile, PrintFile, SaveFile commands. Using a start line number larger than a stop line number. Using only one line number to save part of a file. Using three line numbers to save part of a file.
02	No file on the diskette with filename entered. Trying to load a file not on indicated disk (also purges your text buffer)
04	Diskette is full. No space available.
06	PrintFile command cancelled by using FCTN 4. Disk Drive door is open; no diskette in drive; Disk Drive not turned on.
07	Invalid filename given. (Use of full-stop; name too long, etc.)
15	Invalid Disk Drive number given; LoadFile command given when Disk Controller is not turned on; Print File command executed using invalid devicename.

SCREEN MESSAGES ((

TEXT BUFFER FULL	Too many characters per file to save in that file. Remember, a file may only go up to 23,000 characters. You can either purge, or save your file under two separate files.
MEMORY EXPANSION NOT FOUND	Is your memory expansion unit turned on? Everything connected properly? Peripherals attached and operating?
CANNOT OPEN FILE PRESS ANY KEY	Did you enter the wrong filename? The right Disk Drive number? RS232 Interface Card making contact?
OUTPUT ERROR	Text Formatter print request interrupted by FCTN 4.
ERROR IN SPECIFICATION	When prompts come up "WHAT PAGE(S)?" and "WHICH LETTER(S)?" - only use numbers, commas, dashes or the letter E for End of Document or A for ALL pages.
PROMPT BUFFER OVERFLOW	Buffer allowed for Define Prompt Commands is full. Use fewer commands or shorten prompt text.

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QUICK REFERENCE LISTING ‹‹

Back Tab	CTRL T		
Beginning of Line	CTRL V		
Command/Escape	FCTN 9	or	CTRL C
Delete Character	FCTN 1	or	CTRL F
Delete to End of Line	CTRL K		
Delete Line	FCTN 3	or	CTRL N
Display Line Numbers	FCTN 0	(toggles display)	
Down Arrow	FCTN X	or	CTRL X
Duplicate Line	CTRL 5		
Home Cursor	CTRL L		
Insert Blank Line	FCTN 8	or	CTRL O
Insert Character	FCTN 2	or	CTRL G
Last Paragraph	CTRL 6	or	CTRL H
Left Arrow	FCTN S	or	CTRL S
Left Margin Release	CTRL Y		
New Page	CTRL 9	or	CTRL P
New Paragraph	CTRL 8	or	CTRL M
Next Paragraph	CTRL 4	or	CTRL J
Next Window	FCTN 5		
OOPS!	CTRL 1	or	CTRL Z
Quit	FCTN =		
Reformat	CTRL 2	or	CTRL R
Right Arrow	FCTN D	or	CTRL D
Roll Down	FCTN 4	or	CTRL A
Roll Up	FCTN 6	or	CTRL B
Screen Colour	CTRL 3	(cycles through choices)	
Tab	FCTN 7	or	CTRL I
Up Arrow	FCTN E	or	CTRL E
Word Tab	CTRL 7	or	CTRL W
Word Wrap	CTRL 0	(toggles on and off)	

****

END (Boo hoo - sob...sob...)

{Or is it ? Watch this space... PB}

››END

GENERATING PSEUDORANDOM NUMBERS UNIQUELY

Peter Brooks May 1987

During the last few months I have had a number of enquirers who have been interested in efficiently generating pseudorandom numbers in such a way that each number is only ever generated once.

After having heard most recently from VINCE COHEN, who needed to produce some 900 pseudorandom numbers and who had written a brief program to generate them (and which took, if I remember rightly, more than five hours to produce them!) I thought it might be worthwhile to examine the processes involved, generate a simple program, and then write a brief article on the subject.

I do recollect seeing something mentioned about the subject of unique pseudorandom number generation in one of JIM PETERSON's TIPS FROM THE TIGERCUB, but I don't have any of the TIPS to hand at the time of researching/writing, so my apologies to Jim if any of this material appears to reproduce his own.

The principle behind the process of unique generation is very simple: you want the program to produce a series of numbers in the range 1 to N (or maybe 0 to N), and you only want each number to be produced ONCE.

The simplest pseudorandom number generator uses RND in BASIC, and is of the form INT(RND*N+1) (or INT(RND*(N+1)) for numbers between 0 and N).

However, this form permits the generation of duplicate numbers: there is nothing to prevent the number 1 being produced say 20 times during the running of the program, while the number 3 might appear say 17 times.

These figures are entirely arbitrary, and are for example only.

What many Users may want is the numbers 1, 2, 3, 4, ... up to N to be produced once only - so that the generator program produces one 1, one 2 one 3, etc.

The simplest approach is to create a numeric array, the number of whose elements corresponds to the range of numbers required. If you want 100 numbers (1 to 100) to be generated uniquely, you might DIMension an array of 100 elements. Each time that the RND expression produces a number, it is compared with the array's contents to see if it has already been generated, and if it has, the RND expression is evaluated again and again until it generates a number which has not previously been generated.

This goes on until the array is full, when all 100 numbers will have been generated once only.

However, this is the most time-consuming method, and there are many improvements which can be made, mostly to the algorithms used.

An algorithm is a rule-of-thumb; when you know how to solve a problem, the sequence of actions which lead to its solution are known as the

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ALGORITHM. (Do not, as so many people do, confuse this word with LOGARITHM, which is a mathematical function!).

At some stage I will deal with the differences between an HEURISTIC and an ALGORITHM and explain how they are applied to programming techniques.

The best improvement to the selection algorithm is to ensure that once a given number has been generated using the RND expression, it should not be generated again. This produces a speed improvement over the original simple program of several orders of magnitude. (A routine given later in this article will generate the numbers between 0 and 999 (which can be incremented to give 1 to 1000) in some 17 minutes using Extended BASIC - and the algorithm is not particularly sophisticated).

Now, there is no modification that I know which will prevent RND from producing the same number twice (or more). RND produces a thirteen digit fraction, always less than 1 and greater than 0. This fraction is then multiplied (or processed in some way) to yield a larger number, which may/may not be truncated using the INT() function.

There is little point in investigating ways of modifying RND therefore.

If all the numbers required could be placed in a table, and selected at "random" by RND, and if, once each number had been selected, it could be deleted from the table - so that it could not be selected again - then this might be a profitable avenue to investigate.

For small ranges of numbers, say between 1 and 255, the use of the ASCII coded character and the simple string variable offer the most elementary solution. The string variable is assigned a sequence of characters whose ASCII codes are, or are mathematically related to, the numbers we wish to generate. The RND expression can be used with a variable which alters as the LENGTH of the string alters - which is where the useful SEG$() function comes in.

In this way, the RND expression CAN produce the same number twice (or more) but as it is used with SEG$() on a diminishing "table" - i.e., the string variable holding the characters - it can NEVER produce the same selection from that table.

Over the page you will find a short demonstration program which is designed to generate the numbers 1 to 255 uniquely. It could be changed to generate from 0 to 254, or from 100 to 354 - as long as the RANGE is 255 characters, because that's all we can fit into a single string variable in BASIC.

Its operation is very simple. The first section creates the string variable's contents. The string is composed of characters with ASCII codes ranging from 1 to 255, by the use of a loop from 1 to 255 and the use of CHR$(loop) and concatenation to compile the sequence.

An array is also dimensioned to act as a check (for the purpose of demonstration only - it is up to you whether you "trust" the routine to do its job properly!) so that you can see that each number is generated once only.

The second section generates numbers in the range 1 to the current loop

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```
10 REM  GENERATES NUMBERS (1,255) AT PSEUDORANDOM UNIQUELY
20 REM  PGQB 870425
100 DIM C(255)
110 FOR V=1 TO 255
120 V$=V$&CHR$(V)
130 NEXT V
140 FOR V=255 TO 1 STEP -1
150 P=INT(RND*V)
160 T=ASC(SEG$(V$,P+1,1))
170 PRINT T;
180 C(T)=C(T)+1
190 V$=SEG$(V$,1,P)&SEG$(V$,P+2,255)
200 NEXT V
210 FOR V=1 TO 255
220 PRINT V;C(V)
230 NEXT V
```

value, which itself reflects the current length of the string.

The RND expression (line 150) generates a pseudorandom number which is then used as a "pointer" to index into the current string (line 160).

The ASCII code of the character at this position in the string is then printed (line 170), the array being used to check the generation is then incremented (so that any duplicate generation will show as a value greater than 1 in the appropriate element), and the string is then cut and rejoined in such a way that the character just selected is lost from the string.

As a final check, (lines 210 to 230), the checking array is printed. If any element holds a value greater than 1, the process is invalid (but as I know it isn't invalid, this is just cosmetic!).

One or two points before moving on: it is up to you just exactly what you do with the pseudorandom number which is generated (in line 170 I have simply printed it to the screen). It is also up to you to decide the range of numbers (currently between 1 and 255 here) which you wish to be generated. For larger ranges of number see below.

Note that the table must always DIMINISH in size; the principle of selection does not hold if you begin with an empty table and fill it with your generated numbers as you go along - this would require your program to search the table every time before a number could be regarded as unique - and you would be back to the old problem of duplicate number generation!

You might also prefer to organise your FOR-NEXT loops differently from the way they have been presented here.

To generate numbers with ranges greater than 255, the same principle can still be applied, but it entails a reduction in speed, since we are restricted in our BASIC to just 255 characters per string.

In this case, we use an array of strings, and because we cannot delete a character from one element and have all the successive elements "move up" automatically, our algorithm must be modified to do the "moving up" for us. This complicates matters and reduces the speed of execution,

>>>MORE>

but not by a large factor when one compares the time-saving over the most elementary programs.

An additional complication is the fact that a single ASCII code can only range between 0 and 255; for numbers over 255 a different method of representation must be found.

The simplest solution is to use TWO characters instead of one; this enables an entry in our table to represent a "number" between 0 and 65535! This range is derived by treating the second of the two ASCII coded characters as representing numbers between 0 and 255, while the first character can represent multiples of 256 - we are counting in a base of 256, if that means anything to you.

Thus if the code of the first character is say 2, and that of the second is say 123, then the first code is multiplied by 256 and added to the second code, giving in this case 635. If the codes were (4) and (202), the number being represented would be 4*256+202 or 1226. The codes (0) and (12) would be 0*256+12 or 12. The maximum number which can be represented in this way is (255)(255), or 255*256+255, which is where the figure of 65535 came from. To confuse matters still further, I have chosen to use base 250 in the example routine, as this improves speed of calculation and eases several other problems associated with decoding!

The routine below will generate pseudorandom numbers in the range 0 to 999. The first section creates the table of "numbers", using two ASCII coded characters per "number". To speed calculation and to improve legibility, a maximum of 250 characters (125 "numbers") is placed in each array element. Thus eight array elements are required to store 1000 numbers. The array V() is again purely cosmetic, since it checks that each number is generated uniquely.

```
10 REM GENERATES RANDOMLY NUMBERS BETWEEN 0 AND 999, ONE OF EACH
20 REM PGQB 870427
100 DIM V(999)
110 FOR H=0 TO 3
120 FOR L=0 TO 124
130 R$(H*2)=R$(H*2)&CHR$(H)&CHR$(L)
140 R$(H*2+1)=R$(H*2+1)&CHR$(H)&CHR$(L+125)
150 NEXT L
160 NEXT H
170 FOR C=1000 TO 1 STEP -1
180 P=INT(RND*C)
190 E=INT(P/125)
200 R=P*2-E*250+1
210 T$=SEG$(R$(E),R,2)
220 H=ASC(T$)*250+ASC(SEG$(T$,2,1))
230 V(H)=V(H)+1
240 R$(E)=SEG$(R$(E),1,R-1)&SEG$(R$(E),R+2,255)
250 FOR L=E+1 TO INT((C-1)/125)
260 R$(L-1)=R$(L-1)&SEG$(R$(L),1,2)
270 R$(L)=SEG$(R$(L),3,255)
280 NEXT L
290 NEXT C
300 FOR C=0 TO 999
310 PRINT C;V(C)
320 NEXT C
```

>>>MORE>

You do not need to understand how this routine works in order to use it, but if you want to modify it, well, that's a whole different ball game.

For example, the loop which begins at line 250 is the "move up" section, and it has been enhanced so that null strings are not involved. A null string is an "empty" one, caused by the process of "moving up" the whole table so that it has no gaps. The null strings are created, one by one as the program proceeds, until the whole table consists of null strings (which is when the last character pair has been selected and decoded).

The null strings are created at regular intervals - after the generation of every block of 125 numbers, to be precise, and the calculation in line 250 ensures that the loop only involves non-null strings by altering the loop maximum appropriately.

Nothing is actually done with the numbers generated in this routine; you could print the contents of H once it has been derived (in line 220), or you could send the sequence of numbers to a disk file, or whatever you require.

If you rewrote the routine in 9900 assembly language and assembled it, or wrote it in C99 and compiled and then assembled that, you would end up with a program capable of generating the numbers far more quickly. Perhaps TI Forth, with its stack approach, might be the most suitable for conversion.

If readers feel that a more in-depth explanation of the program's operation is called for, then call for it and I will provide it in a future issue!

>>END