ISHUG NEWS DIGEST

Focusing on the TI-99/4A Home Computer

Volume 6, Number 5 **June 1987**

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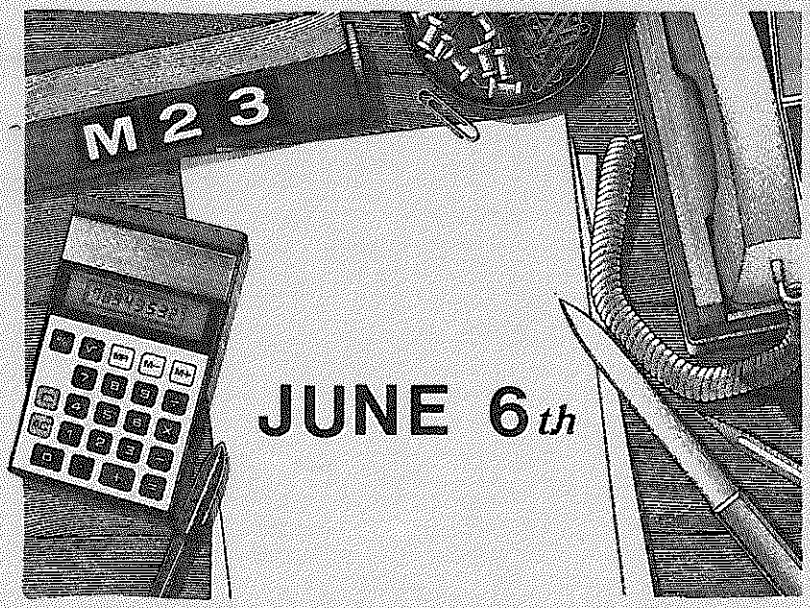

TUTORIAL DAY

P.O. Box 214, Redfern, New South Wales, Australia, 2016 $2

TISHUG NEWS DIGEST

TI99/4A Owners Home Computer
User Group
TIsHUG NEWS DIGEST

JUNE 1987

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MEMBERSHIP AND SUBSCRIPTIONS:

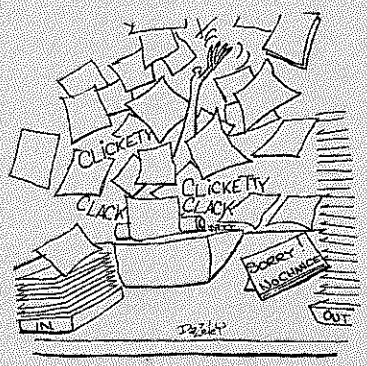
Joining Fee.....$ 8.00
Annual Family Dues.....$25.00
Dues O'seas Airmail...US$30.00
Publications Library....$ 5.00
Texpac BBS.....$ 5.00
BBS Membership:
Other TI User Group
Members.....$10.00
Public Access.....$25.00

GROUP GENERAL MEETING:

First Saturday of each Month at Woodstock Community Centre, Church Street Burwood. Starts 2p

COMMITTEE MEETINGS:

Before the main monthly meeting at Woodstock. Starting at 12:30 pm.



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Page 16 of this issue has a facsimile showing the result of a new program by Arto Heino. This program is the effort of more than twelve months. Some Regional Groups have had demonstrations of it and is known as Picasso Publishing. The printing is simply outstanding, combining text (upper or lower case) with graphics.

It should be available shortly and will be as well received as that other great Aussie program GRAPHX.

The hardware group has also been busy. The ram disk are gone and now there is a stand alone PIO expansion port and a mini expansion system available.

There has been a massive shake out of members and if there was ever a time to pull together it is now. Next month sees the election of five directors for our group. Be there to vote.

Bob Montgomery

CO-ORDINATOR'S REPORT

.... Chris Buttner

COMMITTEE MATTERS

Last month your committee made some decisions which I feel are very important for the club so I am presenting a brief resume for you.
*
Firstly, there is the question of incorporation. The long and the short of it is that as we are presently structured there is no way to incorporate. Without getting bogged down in legal terms, to incorporate we need a finite number of directors each of whom will have only one vote at committee/directors meetings. Each of those directors is required to attend monthly meetings. Those directors are the officers who represent the club publicly and are responsible to ensuring the club meets its statutory obligations. Logically, they would delegate responsibility for the day to day running of the club to your present committee thus retaining the regional group representation. It is proposed to have only 5 directors. It is not necessary for these directors to come from the existing committee members but sensibly it should include the Chairman, Secretary and Treasurer.
*
In essence what is proposed is quite simple: the directors are ultimately responsible for what happens with the club with the day to day running being handled by the present committee members.
*
These changes need to be done by resolution of a Special Meeting which will be held in July.
*
Secondly, the club will be giving grants to a number of software developers to encourage them in writing software. The list includes, Tony and Will McGovern, Paul Charlton, Mark Beck and several others. I want to emphasise this is not a "fairware" payment. Its sole pupose is to encourage these authors who have written quality software to continue in their endeavours and hopefully ensure a continued supply of good and useful programmes for our computer. The responsibility for any "fairware" payments still rests with you if you use the programme.
*
Have you ever wondered how we balance the budget? At the moment, your $25.00 subscription does not cover the production costs of the magazine. The activities of the shop are most important to the club's income if you want to continue with the present high quality magazine and enjoy the other benefits the club provides so please support it.
*
Those of you who attended the April meeting will recall the advance notice of Arto Heino's Desk-Top Publishing programme. I have now seen it in action and feel sure you will all want to own a copy. Any graphics you have made be they Extended Basic, TI-Artist, Graph-X or whatever can now all be used and combined with text. There are a few minor enhancements to complete the programme before Arto releases it but these should not take long. If you see some fancy advertisements in the magazine, odds are they have been done by Arto. I hope you all support Arto who has spent more than a year developing it.
*
INTERNATIONAL RAMBLINGS

A lot has been said by contributors to overseas and local magazines about the subject of copyright to the point where quite bitter arguments have ensued. This may all become old hat if Lotus Corporation has its way in the US.

The present situation has Lotus threatening to take two software houses to court for infringing its "rights". It is important to realise that the rights refered to by Lotus are not copyright but in essence the ability of the other programmes to do the same things in a similar manner. One of the programmes which Lotus claims falls in this category is a well known and much cheaper substitute for 1-2-3. With one swoop, the issue is now not copyright but compatibility.
*
If the action is successful many programmes will be on the endangered species list and could even spill over into hardware. What a minefield!
*
****
*
Texas Instruments has developed the first 32 bit microprocessor chip specially designed for artificial intelligence. It incorporates 553,000 transistors on a single microchip and is expected to drastically reduce the cost of personal computers.
*
****
*
The club's heavy involvement in hardware projects has exposed members to the vagaries and volatility of the memory chip market. A number of large US manufacturers wishing to combat the growing dominance of the Japanese manufacturers have formed a consortium to build a large manufacturing plant where semiconductor technology will be pooled.

HORIZON RAM DISK HINTS.
by Ross Mudie, 29th April 1987.

1. RAMDISK LOCK-UP.

If your Horizon RAM Disk will not respond then disconnect the battery for 30 minutes then reconnect and reinitial- ise the system. If it is not convenient to disconnect the battery, then if the DSR RAM chip is in a socket, unplug it for 30 minutes then replace and reinit- ialise. Remember static precautions!

By removing and replacing the DSR RAM chip rather than the battery, the files and programs stored on the RAM disk may be recoverable if you are very lucky. Don't forget to TURN OFF the PE BOX and WAIT for AT LEAST 2 MINUTES for the power supply voltages to bleed away to prevent destruction of expensive ICs, before removing or replacing the card.

2. COMPUTER LOCKS-UP, NO MASTER SCREEN.

The DSR in RAM on the RAM Disk can become poluted and this may give rise to some rather wierd conditions.

The computer will not come up to an initial master screen at power up when the RAM Disk is plugged in.

* Try removing the DSR RAM chip or disconnecting the battery as per 1 above.

3. RAM DISK WON'T RESPOND TO CALL DN(x)

I found that the RAM Disk would not respond to the CALL DN(1) command, so I loaded the RAM Disk editor and found that it did not recognise that the DSR was loaded. After loading the DSR from the ROS disk the RAM Disk responded normally.

The files held in the RAM Disk were fully intact, it was only the DSR which had become corrupt. The moral here is after reloading the DSR, check the files first before re-initialising the RAM Disk.

* Secretary's Notebook *

Terry Phillips

I hope all those members and their families who attended the May 6th birthday meeting BBQ enjoyed the afternoon and made acquaintances with other members.

Speaking of members, a big TIsHUG welcome to the following 10 who have joined us in the past month:

Ron Fogarty - Mt Riverview
Robert Barrios - Green Point
Dave Clark - Cloverdale (WA)
Jason Baker - Umina
Ken Blackburn - Kurrajong
Gary Russell - Berowra
Peter Pecovnik - St Marys
Ross Thompson - Normanhurst
Bill Devine - Mt Pritchard
Ray Farrell - Coffs Harbour

In the mail, and hopefully received, by the time they read this will be a package of magazines for each of these new members.

As at the 1st of May we had a total of 238 financial members. Others renewed on the meeting date but are not included in this analysis. So where do all our members live? The following table will give you some ideas:-

GPO (Box Address)	1
Eastern Suburbs	7
Inner West	16
North Shore	18
Northern Beaches	10
Parramatta/Hills	49
Southern Suburbs	27
Liverpool Area	9
Campbelltown Area	9
Penrith Area	21
Canberra Area	2
Gosford Area	9
Illawarra/South	12
Newcastle Area	8
North Coast	11
NSW Country (Other)	8
Victoria	6
Queensland	7
South Australia	3
Western Australia	1

As you can see, our membership is very diversified, with the major percentage living out around the Parramatta, Baulkham Hills, Carlingford area.

Surplus Equipment - 2 internal full size drives (without power supplies) are surplus to requirements. These will both be placed on sale at the shop in June. Cyril will advise of their price.

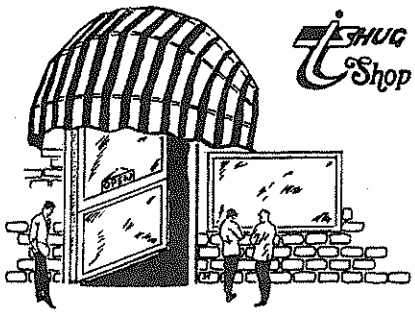
Our next meeting on the 6th June, 1987 will be a full day tutorial workshop day, with the major emphasis being on Ross Mudies assembly tutorial. Ross' session will run for about 5 hours or more, commencing at 9am. For this meeting we have arranged to hire the whole DOWNSTAIRS area of the main Woodstock House. Other items on the agenda for this day include Russell Welham with an insight into TI Writer/Funelwriter and demonstrations of the software you want to see and try out for yourself. Hopefully also Arto will be there with and up and running version of his great new Picasso program. You will also be able to buy your software and other goods as the shop will also be open for at least 2 sessions. There will be a small admission fee on this day, $2, but for this you will also receive a light luncheon and a soft drink. Come along to this day if you can. Remember it's on the Saturday of the Queen's Birthday long weekend, so this should give the opportunity for you country members to attend also.

On a final note, readers will have noticed that I suggested that if your mailing label showed an expiry date of 30-Apr-1987, then the last issue would be it unless you renewed. I have since gone completely through the membership records and found some members who actually have different expiry dates to the commom 30-Apr-1987 date. So again take the time to look at your mailing label. I am confident you will find it now reflects the true expiry date of your membership. (As always, if you disagree please let me know!)

Notice of a Special General Meeting

A special general meeting of TIsHUG will be held on Saturday, 4th July 1987, commencing at 2.00pm at Woodstock Community Centre, Church St, Burwood.

The purpose of this meeting is to elect 5 directors required as part of the incorporation under the Incorporations Act.



TIsHUG SHOP JUNE 1987

Many thanks to Ross Mudie for helping me out with his CLUB SHOP file on the BBS.

RAM DISK CARD STATUS REPORT:-

At the time of writing this article at least four RAM disk cards are up and running.

As advised last month all of the RAM Cards have been sold! But if you missed out on the first run do not be disheartened the SHOP is compiling a list of people who require the RAM card PCB on the second run. This second run would require about 50 members to put a deposit on their order for the RAM card PCB.

As with RAM card PCB's, all the 6264LP-15 and Auxiliary parts kits existing in stock have been sold. We will take orders for these items and if there are enough people interested we will place another order.

Robert Peverill may still be taking orders for the supply of the three (3) AAA size batteries and battery holders required for the Ram disk card. For the price and availability please contact Robert (02)6024168 Please note that the battery holders are very hard to obtain so you may be forced to use the 3 in one heat shrink variety.

SHOP INVENTORY.

Well Mother's Day is over and the blank disk special has come to an end so it's back to the old price of $19.00 per box of 10 disks.

(a) HFi DS/DD 5 1/4" Disks.....$19.00 per box
(b) Spike Protectors.....$29.00
(c) Consoles Ver.2-2.....$65.00
(d) 1 only Double Disk Drive Cable Set..$30.00
(e) 32k Matchbox Memory Expansion $55.00
Fully assembled and include a $10.00 deposit on the GROM PORT.(By the time this article is printed the new stock should have arrived.) Please note there will only be about ten of these 32k Exp. boards made.
(f) T.I. Joystick handles.....$00.50

SECOND HAND ITEMS :-

(a) Keyboards.....$15.00
(b) Power Supply Boards.....$15.00
(c) Grom Ports.....$12.00
(d) Ivory Console Cases.....$ 2.00
(e) Chips to convert your 1983 console to a 1981 version.....$12.00

BOOKS :-

(a) Millers Graphics Smart Prog.Guide...$ 7.50
(b) Technical manual.....$15.00
(c) Micropendiums.....$ 2.90
1986-June to Dec./1987-Jan.to Apr.

SOFTWARE :-

(a) Club Software Tapes.....$ 3.00
(b) Club Software Disks.....$ 5.00

Please NOTE that with all mail orders YOU have to pay postage and packaging.

POSTAGE
The average rates are:-

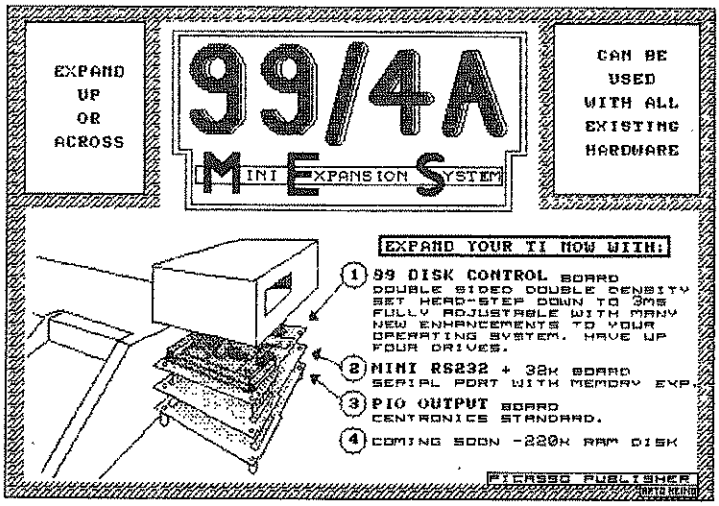
WEIGHT	INTRASTATE	INTERSTATE
up to 50g	50c	55c
over 50g up to 100g	65c	75c
over 100g up to 250g	90c	$1.00
over 250g up to 500g	$1.45	$1.90

over 500g parcel charges and conditions apply

Packaging cost average 60c small item, $1.00 larger items.

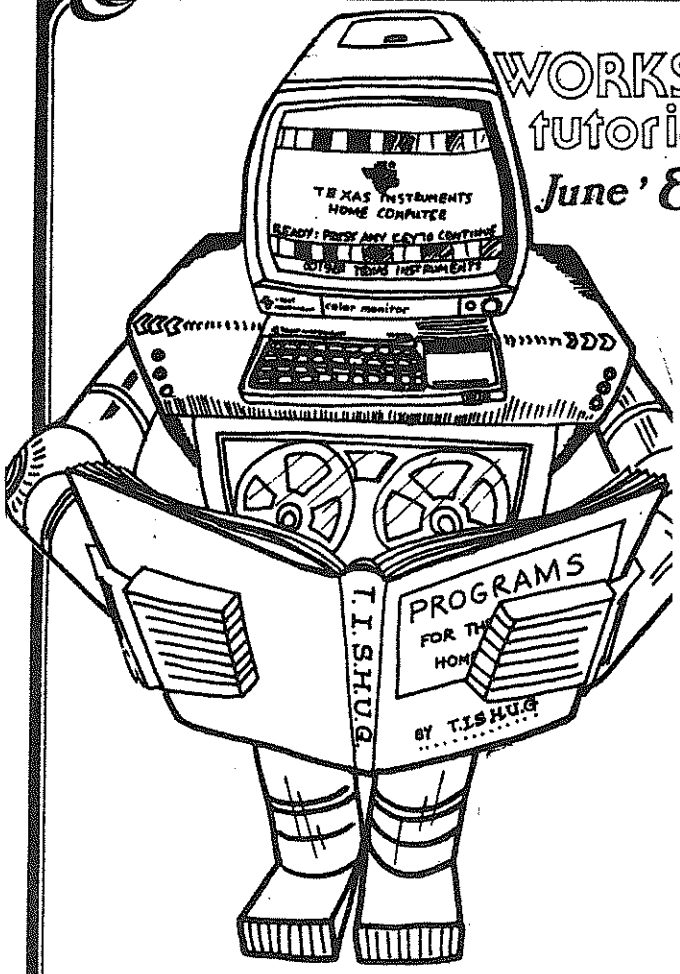
This is only a rough guide to charges.
If paying by credit card the correct charge for post and packaging is debited.

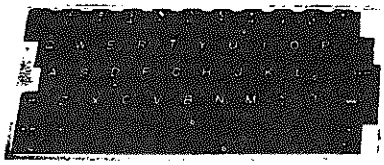
If you are phoning the SHOP please note that I am not normally available before 7pm week days. (02)6395847



On the left is a Picasso Publishing picture of Peter Schubert's (& Co) new mini expansion box. This was shown at the last meeting. Anyone interested in this or the PIO interface described elsewhere in the digest should see Peter as soon as they can.

There is a full page pictorial using Arto Heino's Picasso Publishing program further on in the digest. The program has to have some small additions made to it before it will be released. It shows that another top program will come from Australia. It should be in the shop soon.





TIsHUG TUTORIAL DAY.

TIsHUG will be holding a Tutorial Day on Saturday, 6th June 1987 in Woodstock Community Centre, Church St, Burwood.

This special day will be held on the long weekend to allow country members to attend.

The day will consist of program demonstrations by request, of material held in TIsHUG's software library, tutorials on TI Writer, Funnel Writer, Navarone Data Base and Assembly programming. The club shop will be open and the Publications Library will be available for perusal and loans.

Timetable.

9.00-10.30 Tutorial session 1.
10.30-11.00 Morning tea, Shop open.
11.00-1.00 Tutorial session 2.
1.00-1.45 Lunch, Shop open.
1.45-3.30 Tutorial session 3.
3.30-4.00 Pack up.
4.00-6.30 Committee meeting.

The registration fee will be $2.00 per person and will include hamburger lunch plus soft drink, tea or coffee.

Synopsis of groups.

1. TIsHUG PROGRAM LIBRARY.

Terry Phillips will be bringing the full software library & a computer to demonstrate requested programs.

This activity will be conducted in each of the three sessions.

2. TI WRITER, FUNNEL WRITER, NAVARONE DATA BASE.

Russell Welham will demonstrate how to use the TI-Writer program, including a detailed discussion of the special commands. He will explore the use of the formatter in the Writer.

He will later cover the latest Funnel Writer and the other programs on this disk.

The Navarone Data Base will be available if members wish to review the operation of this program.

During each session Russell will be demonstrating features requested by the participants, so this is an opportune time to sort out any problems that you might be having with these programs.

3. ASSEMBLY LINKED FROM BASICS.

This class will be presented by Ross Mudie who will be using a simulation of the TEXPAC BBS to demonstrate the use of assembly to perform functions not possible in basic or extended basic.

The following details the likely content of each session.

Session 1. Introduction to the BBS.

Two computers will be set up, one working as the BBS, the other as the user's terminal. The use of the BBS will be shown along with some of the remote sysop functions. Memory usage of the BBS will be discussed and this will be related to the hardware of a console mother board.

A start point will chosen in the BBS basic program and the class will CALL LINK into the assembly program. At this time Ross will demistify the utilities which allow values and strings to be passed from the basics to assembly and back again.

Session 2 - Loading TEXT into BUFFER.

By this stage TEXT in the main menu of the BBS will be MOVed into the BUFFER ready to be sent out via the RS232 card. In this session there will also be a discussion on just how a program is edited & assembled.

Session 3 - Use of DSRLNK.

In this session you will see how basic or extended basic sets up a peripheral access block when you open a file. Ross will show how to find this PAB in assembly and then use the DSRLNK program to write the menu to the RS232 card for transmission to the terminal computer.

You will need to bring your own note pads, pencils and Editor Assembler book (if you have one). A booklet giving all the programs being studied will be supplied to the people who are attending this tutorial, only. There will be insufficient copies of the book for general distribution on the day.

Ross successfully presented this tutorial to the Central Coast regional group in April.

THE COMMUNICATORS

Special Interest Group for
Users of the TEXPAC Bulletin Board Service.

by Ross Mudie, SYSOP, 4th May 1987.

1. BBS MAIL.

The BBS is currently holding quite a lot of mail for members who haven't logged on recently. All users are requested to log on at least once each month to collect any mail. In future it will be necessary to delete any mail which is over 2 months old.

The core of the mail routine in the BBS has been converted fully to assembly which speeds up the return of the > prompt after enter is pressed at the end of each line. The program for transferring a file as mail into the BBS has been upgraded to allow it to respond to the faster BBS. This program is named SENDMAIL3 and is available on the downloadable section of the BBS.

The mail routine now permits characters in the range >10 to >7F which permits the transmission of RLE image files. Users wanting more information on the aspect of RLE file transfer and use should contact Arto Heino, username ARTY on the BBS.

If you are using a TEII module & commence to receive a RLE file the terminal emulator will most likely cease to update the screen because of a CHR$(27) in the file. It may be necessary to Quit TEII and start again to re-enable the writing of received information to the screen. A RLE file can be received with 4A-TALK or FAST-TERM.

2. DOWN LOADABLE PROGRAMS.

Each month a selection of TI Basic & Extended Basic programs are placed on the BBS. Due to memory limitations in the BBS at present the maximum program size is 40 sectors. The selection of programs is normally changed around the first of each month but this varies dependant on holiday periods and workload.

3. NEWS and INFORMATION FILES.

News and information files are added throughout each month. Usually a selection tutorial files are placed on the BBS at the same time as the programs are changed around the first of each month. The files which are added during the month are usually left on until the monthly update occurs after the item has been on for greater than a full month.

Advertisements are left on the BBS for one month unless earlier removal is requested. Advertisers are requested to advise the SYSOP when an item is sold or withdrawn from sale.

4. NEW MODEM for the BBS.

A great deal of time has been spent working with the new modem which at the time of preparation of this file was still not interworking satisfactorily with the BBS.

Work on the modem must take its place in the priorities of things to be done on the BBS behind the tasks of file maintenance (ie. placing items from ALL mail in to the appropiate adds or news file, answering SYSOP mail, updating meetings files etc) and program improvements. At present I am still spending up to 150 hours per month on the BBS.

5. NEW MEMBERS.

New members are welcome on the BBS. The BBS will allow 201 user names and there are plenty of spares at present. TIsHUG members who are not currently using the BBS may be interested to see a demonstration of the BBS software at the start of the Tutorial Day on the 6th June 1987, at Woodstock Community Centre, Church Street Burwood. The BBS programs will be used for my assembly language tutorial and 2 computers will be set up for demonstration purposes.

REPAIR SERVICES FOR TI99/4A CONSOLES AND PERIPHERALS.

by Ross Mudie, 7th May 1987.

If your TI99/4A console or a peripheral fails how do you get it fixed?

Texas Instruments still provide a repair service and various people in TIsHUG and the regional groups are are building up both test equipment and expertise.

Texas Instruments at North Ryde (02 887 1122) are still operating an exchange service for consoles and a repair service for TI peripherals. TI will exchange a faulty console for $95 but there is no repair service for faulty Command Cartridges or Joysticks. TI repairs faulty TI peripherals but the delay on service has been found to be 4-8 weeks or more. The following charges (current 6/5/87) are applied by TI for the repair of TI peripherals. Power Supply-$45; Modulator-$55; Speech Synthesizer-$75; any one of Disk Controller, RS232, Card, 32K Memory Card or Pcode Card-$85 each; P.E. Box-up to $135; Disk Drives-up to $295.

The TIsHUG technical committee and several regional groups have now developed the expertise and have test equipment to permit diagnosis & repair of most faults. The following lists known persons and groups who may be able to assist with repairs. Those shown * are equipped with Geoff Trott's console tester.

* Bob Montgomery (042) 28 6463	Illawarra Regional Group	Wollongong
* John Paine (02) 625 6318	TIsHUG	Mt Druitt
* Ross Mudie (02) 456 2122	TIsHUG	Berowra
* Dennis Norman (02) 452 3920	Manly-Warringah	Davidson

Peter Schubert (02 358 5602) provides service for peripherals which he has developed and built.

John Paine also provides service on CorComp products.

Most repairers from the user groups are charging a fee for service and for the parts, but the cost is most likely to be less than TI and the turn around will in most cases be better.

If you have need to call any of the user group people who are doing the "spare time" repairs, please remember that these people need their sleep and calls after 9.30 pm should be avoided.

In the case of faulty command cartridges, John Paine has successfully repaired various cartridges. In many cases people will now have back up copies of cartridges on tape or disk and for this reason the repair may not be worthwhile. Please do not throw any defunct cartridges away, the cases can be used for future User Group projects. Either hold onto old cartridges yourself or give them to TIsHUG technical committee to allow better presentation of future new products.

The future viability of your TI99/4A looks good with TIsHUG and several enthusiastic regional groups gearing up for active ongoing support of this great little computer.

TECHO TIME

.... John Paine

Last month I made reference to the repair of modules, with regard to Minimemory and Extended Basic. To repair these modules I have developed the 'cheats' way of diagnosing the problems and then replacing the appropriate chip with either a new chip purchased from TI or in the case of a faulty ROM chip, by using the Mechatronics Eprom Programmer to clone a similar Eprom.

There are two methods of determining where the fault is ;
.....1) Use the TROTT Console tester to see if cartridge GROM Checksum is correct. If GROMs checkout OK then ROM must be crook. If GROM checksum is not correct then I just have to replace the GROM with any spare GROM I have in stock or trudge of to TI and try to buy a spare. This method is not very cost effective if the faulty module is only a games module, as most of these modules have been cracked at one time or another and are available as disk and/or cassette files. In reality the only modules that I will seriously consider repairing are Extended Basic, Minimemory and Editor Assembler. Replacement GROMs cost around $15.00 Aust. or can be sourced from the U.S. for around $8.00 U.S.

2) Use my GramKracker to download the faulty module to disk and then use a sector compare utility to compare the disk file to a known good module which was also dowloaded to disk. Without sounding like the greatest pirate on earth, I would believe that most GK owner would have on file somewhere just about every module known to the TI community. This method will always highlight ROM problems where only one bit of data is corrupt, but causes module to malfunction. By examining the sector address I can determine which chip is faulty and replace.

Minimemory RAM can also be tested by a couple of little routines or simply by using the edit memory function fill option. The MM ROM can be directly replaced with a TMS2532 eprom programmed by the Mechatronic Eprom Blower. I believe that I have most of the TI ROMs on file for modules and if any reader needs any system, module or peripheral device, I can provide them in a memory image disk file or actually programmed in the appropriate EPROM.

Extended Basic ROMs are a little more difficult to replace as the code resides in two masked ROMs similar to the TI TMS4764 rom which is an 8k ROM with only 24 pins as against the industry standard EPROM with 28 pins. This problem is not insurmountable, because with a little bit of hacking the code can be loaded into a 2764 EPROM and the 28 pin package connected to the 24 holes vacated by the masked ROM. (Similar method used in making super cartridge.). Four pins are left floating in mid air and the necessary wires terminated to these pins. I must admit that while stock is still available, I prefer to replace XB roms with new ROMs purchased from TI.

Although I mentioned that I do not like replacing faulty GROM/ROM chips in games modules, I would appeal to anybody with a faulty module to donate the same to the Technical SIG rather than just throw it out. The cases and PCB's can be used to develop new goodies to keep this orphan running.

At the time of writing, all Ramdisk boards have been delivered and a number of units are now successfully operational. A note of caution when soldering the RAMchips and/or sockets. Excessive heat has been responsible for breaking the tracks on address/data bus lines in a couple of cases but these were easily repaired. Please be careful.

FAULT of the MONTH

This past month was mainly devoted to the long awaited Annual holiday that I have been anticipating for the last four years. In true fashion I journeyed south to visit some friends from the TI community in Melbourne, and to renew some old contacts made at the TI Fair held last year.

I had some gear with me and demonstrated the the console tester to my hosts. As it turns out, my host's console behaved itself as it should when first turned on. Some time after, my host asked to see the tester in action again, and this time the console tester detected an error in the VDP ram. The console had been working as expected most of the night and did not seem to be suffering any problems. Thinking on this matter my host then suggested that he sometimes had system crashes on certain programs and in particular a very large basic program that he sometimes used did not seem to work now. He put this down to a faulty disk or load as the machine did not appear to malfunction with any other program.

In the meantime, the system was shut down while we had our obligatory cup of coffee, and when we decided to check again.....system OK. What.....The next step was to let system run for a few minutes and check again...Yes U104 was showing up as in error. Turn off and let machine rest for a few minutes.....Yep all OK again. OK we had now determined that ram chip would partially fail after a few minutes of operation. Simply replace chip with a new 4116 and ponder the event.

I believe that this fault was actually the internal bonding of an address line was coming adrift when chip reached operating temperature, and this address was in that mystical area of memory generally referred to as the STACK or program area of the VDP ram memory map which would only be in use when a large BASIC program would be loaded. Any XB or Assembly program would have been loaded into the 32k expansion memory, and to this day, my host would still believe that his file on disk was faulty, not his console.

If any member has any doubts about the integrity of the VDP ram, try running a very large BASIC program and see if the program will crash. If it does and you know the program works normally then maybe you have the same type of problem. Please feel free to contact me or perhaps contact your local regional group leader and the problem can be easily rectified at minimal cost. It certainly is cheaper to let your fellow members advise or repair than to pay the $95.00 console changeover fee that is available from TI.

POTENTIAL RAM DISK CONSTRUCTION PROBLEM.

The resistors at each end of the battery on the RAM Disk are connected to the PCB at one end and directly to the respective end of the battery on the other end.

Apparently the component mounting drawing gives the impression that these resistors are mounted hard down on the board, this is not the case.

If in doubt refer to the circuit diagram for actual connections.

As I sit and write this I am reflecting on the following - "How many members still only have a tape driven system?". You may recall I mentioned this aspect briefly a couple of issues ago. My problem, then as it is now, is what software to place on each months tapes. From what I gather, speaking with our shop manager, sales of tapes are at an all time low, and from this I understand that most members must have converted to disk operation. In the Secretary's column you will see that membership is down to around the 250 mark, and as I know that at least 65 members have order RAM cards through the shop then I must also reach the conclusion that disk drives are it!

What I would like to know is whether this is in fact so.

Now I, as much as the next person, hate doing surveys, but I feel in this case there is a bit of information I need to know. Certainly I need to know so that I can satisfy the software need of all members, not those purely with disk drives. As I have said earlier, there appears to be a never ending supply of good disk software, but tape software - without 32K expansion - is a different story.

Therefore, would tape only people, if you are out there, please take the time and write to me and let me know what you are looking for on tape. Do you want home use programs, routines, games or whatever. But please DO IT NOW!

OK. Enough of that here's the software line-up for the June meeting.

ON DISK:

1. KEIR WELLS DISK - many of you probably know Keir, formerly of Sydney and now living a life of luxury up on the glorious Banana Coast, where he is the Co-ordinator of that local Regional Group. Thanks Keir for this great disk and keep them coming. Here's what you get:

CHARA1 - a new character set developed for use with TI Writer. The main use will be for members with a monochrome monitor although you can also use it with your color TV/Monitor. The characters are slightly larger than the ones you have been used to working with but they still retain true lower case with descenders.

MPCHAR - this one will appeal to Multiplan users. Keir suggests (in his own opinion) it is much better than the file supplied by TI. Again, this is a enhanced character set.

SOLITI - a great peg jumping game written entirely in assembly. This game has seperate loaders for XB or EA3 as well as a document file to help you get started. Only problem is there is no solution inbuilt so I hope you can get further into the game that what I could. Keir, in his accompanying letter, would like to hear from members, with their thoughts on his programs. If you wish to write and don't know his address, then send your letters care of me to pass onto him.

2. MARTY KROLL'S CATALOGUING LIBRARY - so you already have several of these in your library. Throw them away! This is by far the best version you are ever likely to see (My Opinion). Here are a few of the features of this excellently written piece of software:

. catalog 123 disk or 900 files

. save all data for later listings, additions or deletions.

. use either single or multiple disk drives. If using single then no need to switch until all additions or deletions are made.

. first catalogs to screen, then gives the option of adding to disk file.

. will advise if diskette being catalogued is already on file. If so gives option to give disk a temporary name.

. can catalog "funny" sectored disks.

. elimates not printable characters from file names and replaces them with a period (.).

. allows printing of a standard format catalog.

. numerous formats for printing out your catalog.

. very fast sort routines.

In fact, this utility, written entirely in assembly is one of the best pieces of software I have ever used. Very simple to use with on screen menu and a single key press will get you going. Imagine having 123 disks on file and instantly cataloguing any disk from that vast record. This is what you can do with this excellent piece of software.

The author, Marty Kroll, has issued this program as fairware. If you use it then by all means send him the $10 suggested donation.

3. UTILITIES 87/1 - a disk chock full of 42 small utilities courtesy of Jim Peterson. If you don't get something from this disk then your not trying. I think you'll like it.

4. UTILITIES 82/2 - OK, so you did like that one. Well here are 31 more, also mainly from Jim. This one is probably better value that the first, but just to be on the safe side get them both.

ON TAPE:

As I write this the paste up deadline has beat me, so your guess is as good as mine as to what will be on this months tape. There will, however only be one and it will be numbered 1987/6. The same programs will also be on disk for those who prefer it that way.

In closing don't forget to come along to the BIG full day workshop on Saturday, June 6th, where I will be demonstrating any programs you would like to see from the entire library collection, including a great new game (for you gamers) I have just received called Space Station Pheta. This one is written in Wycove Forth and is a lot of fun. So see you there!

'Sorry—we've only just started using these things, and you're a programming error.'

DON'T SELL THEM SHORT AND DON'T SELL THEM AT ALL
$$$

```
100 REM *************
110 REM * HAMMURABI *
120 REM *************
130 DATA HAMMURABI,GOVERN TH
E ANCIENT KINGDOM,OF SUMER
140 DATA 1980 TEXAS USERS GR
OUP,PRESS ANY KEY TO BEGIN
150 DATA 0,0,0,95,2800,3000,
3,5,3,0,0,0,0
160 DATA "HAMMURABI, MAY I P
RESENT",LAST YEAR'S REPORT:,
YEAR,PEOPLE STARVED:,NEWCOME
RS:
170 DATA A PLAGUE KILLED,HAL
F OF THE PEOPLE
180 DATA KILLED BY ENEMY:,KI
LLED IN ACTION:,PRISONERS OF
 WAR:
190 DATA CURRENT POPULATION:
,WE NOW OWN (ACRES):,WE HARV
ESTED,(BUSHELS PER ACRE):,RA
TS ATE (BUSHELS):
200 DATA BUSHELS IN STORAGE:
,NEIGHBORS ARE ATTACKING US
210 DATA "RETURN PRISONERS (
Y/N)? "
220 DATA LAND TRADING VALUE,
(BUSHELS PER ACRE):
230 DATA "BUY LAND  (Y/N)? "
,"HOW MANY ACRES? "
240 DATA "SELL LAND (Y/N)? "
,"HOW MANY ACRES? "
250 DATA BUSHELS TO FEED,"TH
E PEOPLE?      ","SOLDIERS TO
 FIGHT ENEMY? "
260 DATA "ACRES TO PLANT? ",
"BUT HAMMURABI,",WE HAVE ONL
Y,PEOPLE,TO TEND THE FIELDS!
,"THINK AGAIN:      "
270 DATA YOU KILLED,PEOPLE,I
N ONE YEAR!!!
280 DATA THE POPULATION IS R
IOTING,AND DEMANDING YOUR HE
AD.
290 DATA RUN FOR YOUR LIFE!!
,GOOD BYE.
300 DATA "BUT HAMMURABI, YOU
 HAVE ONLY",BUSHELS OF GRAIN
!,"THINK AGAIN:      "
310 DATA "BUT HAMMURABI,",WE
 OWN ONLY,ACRES.,"THINK AGAI
N:     "
320 DATA HAMMURABI: I CANNOT
 DO THAT!,"TRY AGAIN:       "
330 DATA "ANOTHER GAME (Y/N)
? "
340 DATA YEAR SUMMARY,DEATHS
 BY WAR," OR STARVATION:","
YEARLY AVERAGE(%):"
350 DATA ACREAGE PER PERSON:
,BEGINNING:,ENDING:
360 DATA YOU DID AN OUTSTAND
ING JOB!,THE PEOPLE ARE CHEE
RING,AND BEGGING YOU TO STAY
.
370 DATA "WILL YOU (Y/N)? ",
100,2,392,494,587,784
380 DATA "GOVERNING ISN'T EA
SY, BUT","YOUR PERFORMANCE,
FRANKLY,",WAS LOUSY.,THE PEO
PLE ARE OUTRAGED.
390 DATA YOU BETTER LEAVE QU
ICKLY.,GOOD BYE.
400 DATA NOT TOO BAD!,"YOU C
OULD HAVE DONE BETTER,",BUT
WE ALL ARE HUMAN.
410 DATA HOW ABOUT ANOTHER,"
TERM (Y/N)? "
420 DATA SO LONG.
430 DATA 0038383810387EFD,38
7C7CFE2828286C,001C1C1C083E7
EBE,BE3E3E3E24242466
440 DATA 0000000367652722,31
2B0F0303131F1F,000000C0E0A0E
04,88D8F0C0C0C8F8F8
450 DATA 0000070F09090F0F,04
0303180E030E18,0000E0F09090F
0F,20C0C01870C07018
460 DATA 00000000B4FCFC78,30
3078FCFCB4,000000005A7E7E3C,
18183C7E7E5A
470 DATA 0000000000130F17,3F
1F001E212018,0000000000E0F0F
E,F9F1020CF
480 DATA 0000000003391770,FE
FEFEFEFEFE7C,00000000801CC83
E,7F7F7F7F7F7F3E,3C4299A1A19
9423C
490 DATA 0001010120271B03,00
C2C2C282F2EEE2,030307060E0C1
C,E2E272323A1A1E
500 REM **PROGRAM**
510 CALL CLEAR
520 RESTORE 430
530 FOR I=104 TO 132
540 READ A$
550 CALL CHAR(I,A$)
560 NEXT I
570 CALL SCREEN(11)
580 RESTORE 130
590 READ A$,B$,C$
600 PRINT TAB(9);CHR$(104)&C
HR$(106);TAB(14);CHR$(129)&C
HR$(130);TAB(19);CHR$(108)&C
HR$(110)
610 PRINT TAB(9);CHR$(105)&C
HR$(107);TAB(14);CHR$(131)&C
HR$(132);TAB(19);CHR$(109)&C
HR$(111)
620 PRINT : :TAB(11);A$: :
630 PRINT " "&B$: :TAB(11);C
$: :
640 PRINT TAB(9);CHR$(116)&C
HR$(118);TAB(14);CHR$(120)&C
HR$(122);TAB(19);CHR$(124)&C
HR$(126)
650 PRINT TAB(9);CHR$(117)&C
HR$(119);TAB(14);CHR$(121)&C
HR$(123);TAB(19);CHR$(125)&C
HR$(127)
660 READ A$,C$
670 PRINT : : : :TAB(4);CHR$
(128)&A$: : : : :TAB(4);C$;
680 CALL SOUND(150,1400,5)
690 CALL KEY(0,K,S)
700 IF S=0 THEN 690
710 RANDOMIZE
720 RESTORE 150
730 READ D1,P1,Z,P,S,H
740 E=H-S
750 READ Y,I,Q,W,PR,SLD,KL
760 A=H/Y
770 D=0
780 Z=Z+1
790 IF Z=1 THEN 810
800 IF (Z-1)/5=INT((Z-1)/5)T
HEN 2830
810 CALL CLEAR
820 RESTORE 160
830 READ A$,B$,C$
840 PRINT A$:" "&B$: :
850 PRINT TAB(9);C$;" ";STR$
(Z-1)
860 READ A$,B$
870 PRINT CHR$(112)&CHR$(114
):
880 PRINT CHR$(113)&CHR$(115
);"  "&A$;TAB(24);D
890 PRINT CHR$(108)&CHR$(110
):
900 PRINT CHR$(109)&CHR$(111
);"  "&B$;TAB(24);I
910 P=P+I
920 IF Q>0 THEN 970
930 P=INT(P/2)
940 RESTORE 170
950 READ A$,B$
960 PRINT :CHR$(112)&CHR$(11
4);"  ";A$:CHR$(113)&CHR$(11
5);"  ";B$:
970 IF W=0 THEN 1090
980 RESTORE 180
990 READ A$,B$,C$
1000 IF KL=0 THEN 1040
1010 PRINT :TAB(5);A$;TAB(24
);KL:
1020 KL=0
1030 GOTO 1090
1040 IF SLD=0 THEN 1080
1050 PRINT :TAB(5);B$;TAB(24
);SLD:
1060 SLD=0
1070 GOTO 1090
1080 PRINT :TAB(5);C$;TAB(24
);PR:
1090 RESTORE 190
1100 READ A$,B$
1110 PRINT CHR$(104)&CHR$(10
6):CHR$(105)&CHR$(107);"  "&
A$;TAB(24);P: :TAB(5);B$;TAB
(24);A: :
1120 READ A$,B$,C$
1130 PRINT CHR$(116)&CHR$(11
8);"  "&A$:CHR$(117)&CHR$(11
9);"  "&B$;TAB(24);Y:
1140 PRINT CHR$(120)&CHR$(12
2):CHR$(121)&CHR$(123);"  "&
C$;TAB(24);E:
1150 READ A$,B$
1160 PRINT CHR$(124)&CHR$(12
6):CHR$(125)&CHR$(127);"  "&
A$;TAB(24);S: :
1170 IF Q<1 THEN 1220
1180 IF Q>2 THEN 1220
1190 PRINT TAB(2);B$: :
1200 W=5
1210 GOTO 1230
1220 W=0
1230 C=INT(10*RND)
1240 Y=C+17
1250 IF PR=0 THEN 1270
1260 GOSUB 3440
1270 RESTORE 220
1280 READ A$,B$,C$
1290 PRINT TAB(5);A$;TAB(5);
B$;TAB(24);Y: :
1300 INPUT C$:A$
1310 IF A$="N" THEN 1460
1320 IF A$<>"Y" THEN 1300
1330 READ A$
1340 INPUT A$&" ":Q
1350 IF Q>=0 THEN 1380
1360 GOSUB 2790
1370 GOTO 1340
1380 IF Y*Q<=S THEN 1410
1390 GOSUB 2680
1400 GOTO 1340
1410 IF Q=0 THEN 1460
1420 A=A+Q
1430 S=S-Y*Q
1440 C=0
1450 GOTO 1610
1460 RESTORE 240
1470 READ B$,A$
1480 INPUT B$:C$
1490 IF C$="N" THEN 1610
1500 IF C$<>"Y" THEN 1480
1510 INPUT A$&" ":Q
1520 IF Q>=0 THEN 1550
1530 GOSUB 2790
1540 GOTO 1510
1550 IF Q<A THEN 1580
1560 GOSUB 2720
1570 GOTO 1510
1580 A=A-Q
1590 S=S+Y*Q
```

```
1600 C=0
1610 PRINT
1620 RESTORE 250
1630 READ B$,A$,C$
1640 PRINT B$
1650 INPUT " "&A$:Q
1660 IF Q>=0 THEN 1700
1670 GOSUB 2790
1680 GOTO 1650
1690 REM **ENOUGH GRAIN TO F
EED?**
1700 IF Q<=S THEN 1750
1710 GOSUB 2680
1720 RESTORE 250
1730 READ B$,A$,C$
1740 GOTO 1640
1750 S=S-Q
1760 C=1
1770 PRINT
1780 IF W=0 THEN 1840
1790 INPUT C$:SLD
1800 IF SLD>P THEN 1790
1810 GOSUB 3550
1820 PRINT
1830 GOTO 1840
1840 RESTORE 260
1850 READ A$
1860 INPUT A$&" ":D
1870 IF D=0 THEN 2090
1880 IF D>=0 THEN 1920
1890 GOSUB 2790
1900 GOTO 1860
1910 REM **ENOUGH ACRES TO P
LANT?**
1920 IF D<=A THEN 1960
1930 GOSUB 2720
1940 GOTO 1860
1950 REM **ENOUGH GRAIN FOR
SEED?
1960 IF INT(D/2)<=S THEN 200
0
1970 GOSUB 2680
1980 GOTO 1840
1990 REM **ENOUGH PEOPLE TO
TEND THE CROPS?
2000 IF D<=10*(P-SLD)THEN 20
80
2010 RESTORE 260
2020 READ A$
2030 READ A$,B$,C$
2040 PRINT A$:B$;P-SLD;C$
2050 READ B$,A$
2060 PRINT B$
2070 GOTO 1860
2080 S=S-INT(D/2)
2090 GOSUB 2770
2100 REM **HARVEST**
2110 Y=C
2120 H=D*Y
2130 D=0
2140 IF H<>0 THEN 2160
2150 Y=0
2160 E=0
2170 GOSUB 2770
2180 IF INT(C/2)<>C/2 THEN 2
210
2190 REM **RATS**
2200 E=INT(S/C)
2210 S=S-E+H
2220 GOSUB 2770
2230 REM **NEWCOMERS**
2240 I=INT(C*(10*A+S)/P/100+
1)
2250 REM **PEOPLE FED**
2260 C=INT(Q/20)
2270 REM **CHANCE OF PLAGUE*
*
2280 Q=INT(15*RND)
2290 IF W>0 THEN 2370
2300 REM **PERCENT STARVED**

2310 IF P>C THEN 2340
2320 P1=(Z-1)*P1/Z
2330 GOTO 770
2340 PRINT : :
2350 D=P-C
2360 GOTO 2440
2370 IF KL>0 THEN 2420
2380 IF W=1 THEN 2410
2390 SLD=INT(SLD*RND)+1
2400 GOTO 2420
2410 SLD=0
2420 IF P<C THEN 2440
2430 D=P-C
2440 IF D+SLD+KL>.45*P THEN
2540
2450 P1=((Z-1)*P1+(D+SLD+KL)
*100/P)/Z
2460 P=C-SLD-KL
2470 D1=D1+D+SLD+KL
2480 IF W<>1 THEN 780
2490 IF SLD>15 THEN 2520
2500 PR=INT(10*RND)+1
2510 GOTO 780
2520 PR=INT(15*RND)+1
2530 GOTO 780
2540 CALL CLEAR
2550 CALL SCREEN(9)
2560 RESTORE 270
2570 READ A$,B$,C$
2580 PRINT A$;D;B$:C$: :
2590 RESTORE 280
2600 READ A$,B$
2610 PRINT : :A$;B$
2620 READ A$,B$
2630 PRINT A$: :B$: : : : :
: :
2640 FOR I=392 TO 196 STEP -
10
2650 CALL SOUND(-100,I,2)
2660 NEXT I
2670 GOTO 3340
2680 RESTORE 300
2690 READ C$,B$,A$
2700 PRINT :C$;S;B$
2710 RETURN
2720 RESTORE 310
2730 READ A$,B$,C$
2740 PRINT A$:B$;A;C$
2750 READ A$
2760 RETURN
2770 C=INT(5*RND)+1
2780 RETURN
2790 RESTORE 320
2800 READ B$,A$
2810 PRINT B$
2820 RETURN
2830 CALL CLEAR
2840 RESTORE 340
2850 READ A$
2860 PRINT STR$(Z-1);"  ";A$
: :
2870 READ A$,B$,C$
2880 PRINT A$:B$;TAB(23);D1;
C$;TAB(23);INT(P1*100+.5)/10
0
2890 L=INT(A/P*100+.5)/100
2900 RESTORE 350
2910 READ A$,B$,C$
2920 PRINT A$:" "&B$;TAB(23)
;10
2930 PRINT " "&C$;TAB(23);L
2940 IF P1>33 THEN 2590
2950 IF L<6 THEN 2590
2960 IF P1>10 THEN 3130
2970 IF L<7 THEN 3130
2980 IF P1>3 THEN 3220
2990 IF (L-P1-8)<=0 THEN 322
0
3000 RESTORE 360
3010 READ A$,B$,C$
3020 PRINT :A$;B$;
3030 READ A$,DR,V,T1,T2,T3,T
4
3040 PRINT C$: : : : : :
3050 FOR I=1 TO 2
3060 CALL SOUND(DR,T1,V)
3070 CALL SOUND(DR,T2,V)
3080 CALL SOUND(DR,T3,V)
3090 NEXT I
3100 CALL SOUND(DR*3,T4,2)
3110 INPUT "        "&A$:B$
3120 IF B$="N" THEN 3330 ELS
E 810
3130 RESTORE 380
3140 READ A$,B$,C$
3150 PRINT : :A$;B$;C$
3160 READ A$,B$,C$
3170 PRINT A$: :B$:C$: : : :
 :
3180 FOR I=392 TO 196 STEP -
10
3190 CALL SOUND(-100,I,2)
3200 NEXT I
3210 GOTO 3340
3220 RESTORE 400
3230 READ A$,B$,C$
3240 PRINT :A$;B$;C$: : :
3250 CALL SOUND(200,784,2,98
8,2,1175,2)
3260 CALL SOUND(1000,784,2,9
88,2,1175,2)
3270 READ B$,A$
3280 PRINT : :B$
3290 INPUT "        "&A$:B$
3300 IF B$="N" THEN 3330
3310 CALL CLEAR
3320 GOTO 810
3330 CALL CLEAR
3340 RESTORE 330
3350 READ A$
3360 INPUT A$:B$
3370 IF B$="N" THEN 3410
3380 CALL SCREEN(11)
3390 W=0
3400 GOTO 710
3410 CALL CLEAR
3420 END
3430 REM **RETURN PRISONERS?
**
3440 RESTORE 210
3450 READ A$
3460 INPUT A$:B$
3470 IF B$="Y" THEN 3480 ELS
E 3510
3480 S=S+PR*100
3490 PR=0
3500 RETURN
3510 P=P+PR
3520 PR=0
3530 RETURN
3540 REM **WIN WAR?**
3550 IF SLD<P/100 THEN 3610
3560 IF SLD<6*P/100 THEN 363
0
3570 IF SLD<11*P/100 THEN 36
50
3580 IF SLD<16*P/100 THEN 36
70
3590 W=1
3600 RETURN
3610 KL=INT(P*2/10)
3620 RETURN
3630 W=INT(4*RND)+1
3640 RETURN
3650 W=INT(3*RND)+1
3660 RETURN
3670 W=INT(2*RND)+1
3680 RETURN
3690 REM HOLD SCREEN
3700 FOR I=1 TO 1000
3710 NEXT I
3720 RETURN
3730 END
```

```
100 REM *********
110 REM * CHASE *
120 REM *********
130 FRGM=85
140 CALL CLEAR
150 PRINT TAB(12);"CHASE": :
160 PRINT " YOU ARE IN A HIG
H-VOLTAGE   MAZE.THERE ARE A
 NUMBER OF  GUARDS OUT TO GE
T YOU."
170 PRINT "YOUR ONLY CHANCE
TO MAKE IT IS TO MANUEVER TH
E GUARDS   INTO THE HIGH VOL
TAGE. IF   YOU HIT A GUARD"
180 PRINT "OR A HIGH VOLTAGE
 YOU LOSE. THE CONTOLS ARE:

                   7 8 9"
190 PRINT "PRESS 0"
200 PRINT "FOR A     4 5 6
          RANDOM
          LEAP       1 2 3":
 :
210 PRINT "YOU GET 5 TURNS.
IF YOU CAN DESTROY ALL THE G
UARDS, YOU WILL GET AS MANY
    POINTS"
220 PRINT "AS THERE WERE GUA
RDS": :
230 INPUT "        GOOD LUCK
":A$
240 CALL CHAR(96,"AAFE7FE667
FE7F55")
250 CALL CHAR(104,"7E81A5818
1BD817E")
260 CALL CHAR(112,"3C243CFFB
D24245A")
270 CALL CHAR(136,"C3FE7C7EF
F3F7FF3")
280 CALL COLOR(9,7,3)
290 CALL COLOR(10,5,1)
300 CALL COLOR(14,16,1)
310 PRINT "HOW MANY PLAYERS
WILL THERE BE?"
320 INPUT "ENTER 1 TO 3 ":NM
PL
330 IF NMPL=1 THEN 2160
340 IF (NMPL<1)+(NMPL>3)=-1
THEN 320
350 FOR I=1 TO NMPL
360 SCORE(I)=0
370 NEXT I
380 PL=0
390 RMG=5
400 FOR J=1 TO NMPL
410 FOR GAME=1 TO 5
420 PL=PL+1
430 CALL CLEAR
440 REM MAKE MAZE
450 CALL HCHAR(3,7,96,20)
460 CALL HCHAR(22,7,96,20)
470 CALL VCHAR(4,7,96,18)
480 CALL VCHAR(4,26,96,18)
490 RANDOMIZE
500 C=INT(RND*10)+15
510 FOR X=1 TO C
520 ROW=INT(RND*18)+4
530 COL=INT(RND*18)+8
540 CALL GCHAR(ROW,COL,T)
550 IF T=96 THEN 520
560 CALL HCHAR(ROW,COL,96)
570 RANDOMIZE
580 CALL SOUND(150,INT(RND*1
800)+200,1)
590 NEXT X
600 DIM GRDCOL(120),GRDROW(1
20),GRD(120),OLGRDCOL(120),O
LGRDROW(120)
610 FOR X=1 TO 50
620 GRD(X)=0
630 NEXT X
640 PRINT "HOW MANY GUARDS F
OR #";PL
650 INPUT NMG
660 FOR X=1 TO NMG
670 ROW=INT(RND*18)+2
680 COL=INT(RND*18)+8
690 CALL GCHAR(ROW,COL,T)
700 IF T<>32 THEN 670
710 CALL HCHAR(ROW,COL,112)
720 CALL SOUND(150,X*20+200,
1)
730 GRDROW(X)=ROW
740 GRDCOL(X)=COL
750 NEXT X
760 CALL SOUND(150,200,1)
770 REM PLACE PLAYER
780 ROW=INT(RND*18)+2
790 COL=INT(RND*18)+8
800 CALL GCHAR(ROW,COL,T)
810 IF T<>32 THEN 780
820 CALL HCHAR(ROW,COL,104)
830 PLAROW=ROW
840 PLACOL=COL
850 CALL KEY(0,KEY,STA)
860 IF STA=0 THEN 850
870 OLPLACOL=PLACOL
880 OLPLAROW=PLAROW
890 IF KEY=48 THEN 1130
900 IF (KEY>57)+(KEY<49)=-1
THEN 850
910 ON KEY-48 GOTO 930,960,9
80,1010,1030,1040,1060,1090,
1110
920 REM MOVES
930 PLACOL=PLACOL-1
940 PLAROW=PLAROW+1
950 GOTO 1130
960 PLAROW=PLAROW+1
970 GOTO 1130
980 PLACOL=PLACOL+1
990 PLAROW=PLAROW+1
1000 GOTO 1130
1010 PLACOL=PLACOL-1
1020 GOTO 1130
1030 GOTO 1130
1040 PLACOL=PLACOL+1
1050 GOTO 1130
1060 PLACOL=PLACOL-1
1070 PLAROW=PLAROW-1
1080 GOTO 1130
1090 PLAROW=PLAROW-1
1100 GOTO 1130
1110 PLACOL=PLACOL+1
1120 PLAROW=PLAROW-1
1130 CALL HCHAR(OLPLAROW,OLP
LACOL,32)
1140 IF KEY=48 THEN 1570
1150 CALL SOUND(200,200,1)
1160 CALL GCHAR(PLAROW,PLACO
L,T)
1170 IF T=96 THEN 1650
1180 IF T=112 THEN 1700
1190 CALL HCHAR(PLAROW,PLACO
L,104)
1200 REM MOVE GUARDS
1210 FOR X=1 TO NMG
1220 IF GRD(X)=1 THEN 1550
1230 OLGRDCOL(X)=GRDCOL(X)
1240 OLGRDROW(X)=GRDROW(X)
1250 IF PLAROW>GRDROW(X)THEN
 1270
1260 GOTO 1280
1270 GRDROW(X)=GRDROW(X)+1
1280 IF PLAROW<GRDROW(X)THEN
 1300
1290 GOTO 1310
1300 GRDROW(X)=GRDROW(X)-1
1310 IF PLACOL>GRDCOL(X)THEN
 1330
1320 GOTO 1340
1330 GRDCOL(X)=GRDCOL(X)+1
1340 IF PLACOL<GRDCOL(X)THEN
 1360
1350 GOTO 1370
1360 GRDCOL(X)=GRDCOL(X)-1
1370 CALL GCHAR(GRDROW(X),GR
DCOL(X),T)
1380 IF T=112 THEN 1420
1390 IF T=96 THEN 1420
1400 IF T=104 THEN 1690
1410 GOTO 1460
1420 CALL HCHAR(OLGRDROW(X),
OLGRDCOL(X),32)
1430 GRD(X)=1
1440 CALL SOUND(350,3000,10,
-7,1)
1450 GOTO 1500
1460 CALL HCHAR(OLGRDROW(X),
OLGRDCOL(X),32)
1470 CALL HCHAR(GRDROW(X),GR
DCOL(X),112)
1480 CALL SOUND(-50,110,10)
1490 GOTO 1550
1500 DW=0
1510 FOR Y=1 TO NMG
1520 IF GRD(Y)=0 THEN 1550
1530 NEXT Y
1540 GOTO 1740
1550 NEXT X
1560 GOTO 850
1570 PLAROW=INT(RND*18)+2
1580 PLACOL=INT(RND*18)+8
1590 GOSUB 2070
1600 CALL GCHAR(PLAROW,PLACO
L,T)
1610 IF T=96 THEN 1650
1620 IF T=112 THEN 1700
1630 CALL HCHAR(PLAROW,PLACO
L,104)
1640 GOTO 1200
1650 CALL HCHAR(PLAROW,PLACO
L,136)
1660 CALL SOUND(200,500,3,-3
,1)
1670 PRINT "ZAPPP ---- HIGH V
OLTAGE !!!      NO POINTS THI
S TIME"
1680 GOTO 1760
1690 CALL HCHAR(OLGRDROW(X),
OLGRDCOL(X),32)
1700 CALL HCHAR(PLAROW,PLACO
L,136)
1710 CALL SOUND(200,500,3,-3
,1)
1720 PRINT "THEY GOT YOU ---
 NO POINTS  THIS TIME!!!"
1730 GOTO 1760
1740 PRINT "YOU WON!!!! VERY
 GOOD !!!!   YOU GET";INT(NM
G);"POINTS!!"
1750 SCORE(PL)=SCORE(PL)+INT
(NMG)
1760 FOR X=1 TO NMG
1770 GRD(X)=0
1780 NEXT X
1790 IF PL>1 THEN 1810
1800 RMG=RMG-1
1810 PRINT "PLAYER NUMBER ";
PL;"HAS ";SCORE(PL);"POINTS
WITH";RMG;"TURNS LEFT"
1820 IF (NMPL>1)+(RMG<1)<0 T
HEN 1900
1830 RM=FRGM-SCORE(1)
1840 JACK=INT(RM/RMG)-(INT(R
M/RMG)<>(RM/RMG))
1850 PRINT
1860 PRINT "YOU STILL NEED";
RM;"POINTS  FOR A FREE GAME.
"
1870 PRINT
1880 PRINT "THIS IS ABOUT";J
ACK;"POINTS "
1890 INPUT " PER TURN":RRR$
```

```
1900 INPUT "PRESS ENTER":BUT
$
1910 IF PL<NMPL THEN 1930
1920 PL=0
1930 NEXT GAME
1940 NEXT J
1950 PRINT : : : : : : : : :
1960 FOR I=1 TO NMPL
1970 PRINT "PLAYER #";STR$(I
);"'S SCORE WAS ";STR$(SCORE
(I)): :
1980 NEXT I
1990 IF (NMPL=1)+(SCORE(1)>=
FRGM)=-2 THEN 2110
2000 PRINT "DO YOU WISH TO P
LAY AGAIN?"
2010 CALL KEY(0,KEY,STA)
2020 IF STA=0 THEN 2010
2030 IF KEY=89 THEN 310
2040 IF KEY<>78 THEN 2010
2050 PRINT "          BYE"
2060 END
2070 FOR X=310 TO 410 STEP 5
2080 CALL SOUND(-200,X,3)
2090 NEXT X
2100 RETURN
2110 PRINT "CONGRATULATIONS!
 YOU HAVE   WON A FREE GAME!
"
2120 FRGM=FRGM+INT(FRGM*.1+.
5)
2130 PRINT : : : : : : : : :
 :
2140 FOR D=1 TO 800
2150 NEXT D
2160 CALL CLEAR
2170 PRINT "SCORE";FRGM;"POI
NTS AND YOU"
2180 PRINT "GET A FREE GAME!
"
2190 PRINT : : : : : : : : :
 : :
2200 FOR D=1 TO 800
2210 NEXT D
2220 GOTO 350
2230 END
```

```
100 FOR Z=1 TO 12
110 CALL COLOR(Z,16,1)
120 NEXT Z
130 CALL SCREEN(5)
140 CALL CLEAR
150 DISPLAY AT(5,5):"SEA DIV
ER"
160 !
170 FOR T=1 TO 300
180 NEXT T
190 PRINT "  YOU ARE A DEEP
SEA DIVER
             DIVING FOR GOLD
.
             YOU HAVE GOT TO
"
200 PRINT
210 PRINT "GET TO THE BOTTOM
 OF THE SEA"
220 PRINT
230 PRINT "AND BACK TO THE S
URFACE.
          DODGING THE SHARK
S,CRABS,"
240 PRINT "JELLY FISHES AND
THE SHIP.  USING THE JOYSTIC
K."
250 PRINT
260 PRINT " YOU HAVE TO GET
20 BAGS OF
                GOLD TO WIN."
270 PRINT "PRESS FIRE TO DIV
E DOWN.
             PRESS 'S' TO STAR
T."
280 CALL KEY(1,S,D)
290 IF S=18 THEN 300 ELSE 28
0
300 CALL CHAR(60,"081C2A0814
14"&RPT$("00",24))
310 CALL MAGNIFY(3)
320 RANDOMIZE
330 CALL CLEAR
340 CALL SCREEN(5)
350 CALL COLOR(1,5,5)
360 CALL CHAR(32,"00C0201008
040300")
370 CALL CHAR(33,"0003040810
20C000")
380 FOR T=1 TO 32 STEP 2
390 CALL VCHAR(1,T,33,24)
400 NEXT T
410 CALL COLOR(1,6,5)
420 CALL CHAR(34,"")
430 CALL HCHAR(1,1,34,64)
440 CALL CHAR(40,"0000000014
1830509419305010FF7F3F000000
0000405060C244485060FFFCF0")
450 CALL SPRITE(#2,40,15,8,1
25,0,10)
460 CALL CHAR(44,"0000282810
543810"&RPT$("00",24))
470 CALL SPRITE(#1,44,16,18,
140)
480 CALL CHAR(48,"0000000000
C36F3F67C3000000000000000000
C060F8DFF8F7FC")
490 FOR T=5 TO 8
500 CALL SPRITE(#T,48,10,T*1
2,INT(240*RND)+10,0,INT(20*R
ND)+10)
510 NEXT T
520 CALL CHAR(52,"0000000000
00000000000D63276A1102000000
0000000000000F0F8FC482448")
530 FOR T=9 TO 11
540 CALL SPRITE(#T,52,13,174
,INT(250*RND)+1,0,-10):: CAL
L COINC(ALL,D):: IF D=-1 THE
N CALL DELSPRITE(#T):: GOTO
540
550 NEXT T
560 CALL CHAR(56,"0000000307
030519224C519226281324000000
E0F8FCFEFF1F37CA30C08")
570 CALL SPRITE(#13,56,8,45,
INT(240*RND)+10,0,INT(10*RND
)+10)
580 CALL SPRITE(#12,56,8,30,
INT(240*RND)+10,0,INT(10*RND
)+10)
590 CALL SPRITE(#14,56,8,120
,INT(240*RND)+10,0,INT(10*RN
D)+10)
600 CALL SPRITE(#15,56,8,145
,INT(240*RND)+10,0,INT(10*RN
D)+10)
610 CALL COLOR(9,12,12)
620 CALL HCHAR(23,1,99,64)
630 CALL KEY(1,K,S):: IF S=0
 THEN 630
640 CALL JOYST(1,K,S)
650 CALL MOTION(#1,10,K*2)
660 CALL POSITION(#1,R,C)::
IF R>190 THEN 880
670 CALL COINC(ALL,GT)
680 IF GT=0 THEN 640
690 CALL SOUND(1000,-5,0)
700 LI=LI+1 :: IF LI=5 THEN
710 ELSE 640
710 CALL CLEAR :: CALL DELSP
RITE(ALL):: CALL CHARSET ::
CALL SCREEN(5)
720 FOR Z=1 TO 12 :: CALL CO
LOR(Z,16,1):: NEXT Z
730 PRINT "   YOU NOW LIVE W
ITH"
740 PRINT
750 PRINT " THE LITTLE FISHE
S "
760 PRINT
770 PRINT "AT THE BOTTOM OF
THE SEA"
780 PRINT
790 PRINT "YOU HAVE ";POI:"B
AGS OF GOLD"
800 FOR T=1 TO 5 :: PRINT ::
 NEXT T
810 FOR BMX=1 TO 24
820 READ B,A
830 IF B=0 THEN 860
840 CALL SOUND(A,B,0)
850 NEXT BMX
860 DATA 294,400,294,300,294
,240,294,300,349,400,330,300
,330,350,294,350,294,300,277
,350,294,500,0,0
870 FOR T=1 TO 900 :: NEXT T
 :: RUN
880 CALL MOTION(#1,0,0):: FO
R T=1 TO 10
890 CALL SOUND(-100,T*110,0)
900 NEXT T
910 CALL PATTERN(#1,60)
920 CALL JOYST(1,K,S)
930 CALL MOTION(#1,-10,K)
940 CALL POSITION(#1,R,C)::
IF R<18 THEN 970
950 CALL COINC(ALL,DF):: IF
DF=-1 THEN 690
960 GOTO 920
970 CALL SOUND(-100,-2,0)
980 POI=POI+1
990 IF POI=20 THEN 1020 ELSE
 1000
1000 CALL MOTION(#2,0,10+POI
)
1010 CALL PATTERN(#1,44):: G
OTO 640
1020 CALL CLEAR
1030 CALL DELSPRITE(ALL):: C
ALL CHARSET
1040 CALL CLEAR
1050 CALL SCREEN(16)
1060 FOR Z=1 TO 12
1070 CALL COLOR(Z,5,1)
1080 NEXT Z
1090 PRINT "     **********
**
                 * WELL DONE
 *               *
 *"
1100 PRINT "     **********
**"
1110 PRINT
1120 PRINT
1130 PRINT
1140 PRINT " YOU HAVE GOT AW
AY WITH 20"
1150 PRINT
1160 PRINT "     BAGS OF GOL
D"
1170 PRINT
1180 PRINT
1190 PRINT
1200 PRINT "   PRESS 'S' TO
START"
1210 CALL KEY(1,A,S)
1220 IF A=2 THEN RUN ELSE 12
10
1230 END
```

FORUM

*

Errata

Last month an article made mention of the function "U" to send control codes to the printer to set it for A4 size paper. This should have been CONTROL "U". Our apologies to those of you who may have persevered unsucessfully with the wrong information.

*

The May issue carried details of an alphalock modification which required cutting the track on the keyboard. Some of you may feel uneasy about cutting on the circuit board so here is a successful alternative which I have used. Locate the wire on the ribbon cable connecting the keyboard to the main circuit board (number 6 from the left) and insert the diode into the wire.

A.N.

*

(Ed. Check before cutting ribbon cable and seek advice if you are not sure.)

*

*

Can I transfer data from a TI-Writer file to Multiplan?

Peter C. Blacktown

*

The short answer to your question is NO. You can prepare Multiplan data for use by TI-Writer but not the reverse. However, the February/March issues of Micropendium carried articles on a technique and programme to allow limited data transfer. You may be able to adapt that information to your needs.

*

*

I have a "Heinz Variety" system with all parts being supposedly compatible with TI yet some of the fancier programmes I have seen will not work on my system. Why is this?

Tony S. Sydney

*

The large majority of software uses the DSRs (Device Service Routines) in the peripheral cards to do various functions. These programmes will work because the DSR bridges the gap between the software command and the various chips in the cards. A small number of programmes bypass the DSR's and exercise control by sending commands directly to the chips (such as the disk drive controller chip in the TI Disk Controller Card). Because the newer chips are different, their control logic is different and this is usually what causes the programmes not to work with "third party" hardware.

*

*

I have had a MiniMemory Module for a few years now but suspect the battery is no longer functioning. The module works properly when in the console but it doesn't retain programmes saved to it when the console is turned off. Are the batteries readily available in Australia and how much do they cost?

D.S. Melbourne

*

The batteries are 3V Lithium type and you may be able to get one similar at an electronics store. You could however strike problems in inserting it in the module. The original unit has lugs welded to top and bottom which are then soldered onto the circuit board. Be very careful if you attempt to solder lugs onto the battery - it doesn't like heat and may explode. Commercially, the lugs are spot welded - a process which is very quick and thereby reduces heat transfer inside the battery case. I understand Robert Peverill is able to get them with lugs already fitted for about $5.50. At that price it is probably not worth risking attaching the lugs yourself.

Please tell me what hardware (practical and economical) I should get to have an expanded full system. My system at present is TI99/4A - Extended Basic; 32K; cassette recorder; speech synthesiser. Also what software is most used with a full system.

J. Scott....Penshurst.

Let's start with the hardware. There are a number of ways you can expand the system John. The first and easiest is to purchase a second-hand PE box and plug-in cards. Prices being asked for these vary so much it really isn't possible to give you a guide as to price but it is likely this way may well be the most expensive. It is possible to build your own system and there are a number of designs available (in the HV and other magazines available from the library). The snag with building your own system (assuming you are technically competent to do so) is that you still require the cards such as RS232 and Disk Drive Controller, and they may not be easy to get without the PE box. It is really a question of supply. The other alternative is to purchase one of the third party fully assembled systems. In the past these have been manufactured overseas and are quite expensive once you pay the extras such as exchange rate, import duty and sales tax. There will shortly be a local alternative to these overseas systems. It has been developed by club members and commercial production is expected shortly. Price will be considerably below the imported systems and could feasibly be below what some people want for their old PE Box and cards. Unless you are desperately in need of an expanded system, I suggest you hold off until the price of the local expansion unit is announced.

Once you move to a disk system you will need some form of Disk Manager. There are a number of these available. The most widely used to date is probably DM1000 (a shareware product) available through the club. Your needs will largely determine what other software you purchase. There is now a large base of utility/productivity programmes available for disk users. Generally, they are of the shareware variety and of commercial quality, e.g. Word processors, communications programmes etc.. The list is too extensive to attempt a listing in this column. I suggest you contact one of the regional groups where you will be able to get a demonstration of various programmes which you think may suit your needs.

A very personal assessment of your position could be summarised thus: Wait for the release of the local expansion system and buy according to your price range (unless of course you get and absolute "steal" on a PE box and cards). Don't worry about software at this stage. When you have expanded your system you will be able to get the software you need from the huge range presently on the market (most of which is available through the club).

Q. What does !@P- and !@P+ do in an Extended basic program?

A. In X/B, when you type RUN the computer performs a pre-scan of the program. This allows the computer to check out the program and to build symbol tables for the variable names and sub programs. When pre-scan encounters !@P- the pre-scan is turned off until either the end of the program or a !@P+ is encountered.

If the program encounters a variable or sub program name which was hidden by the pre-scan switching then the program will terminate in a SYNTAX ERROR.

YOUNGer Set with Jenny

The UNDER 18's own page.

I have received two letters from David Perkovic who lives in Marion, Sth Australia.

Dear Jenny,

Hope you like the 2 programs I have enclosed. One "Multiplication Invaders" is an educational game and you can change it into a +,- or / program by changing the lines 530,510.

The other game "Crash Landing" is a short adventure. I hope you like them both.

Some of my highest scores are:

Slymoids	106180
Munchman	86990
Tombstone City	78750

Thanking you,
David Perkovic

Dear Jenny,

I hope you are feeling better. During the Easter holidays I have written the games on the tape enclosed hope you will enjoy them. I am working 2 more games called Freddy in Outerspace and Freddy in the Forest, and I will be sending them to you in the near future.

I wrote a letter to you about a month ago, but it must have got lost.

bye for now
David Perkovic

Thanks for the kind wishes. I really enjoyed your programs. You will notice that I've talked the Editor into putting one of your programs into the Digest. Keep up the good work.

I have asked Terry Phillips, our Secretary, to send to you the programs that you have requested.

You other younger set member's should follow David's example and send your contributions in.

Jenny

```
100 REM  ##################
110 REM  # CRASH  LANDING #
120 REM  # BY D. PERKOVIC #
130 REM  #                #
140 REM  #      1985      #
150 REM  ##################
160 CALL CLEAR
170 PRINT "         CRASH LAN
DING": : :
180 PRINT "      BY DAVID PE
RKOVIC": : : : : : :
190 PRINT "WANT INSTRUCTIONS
? (Y OR N)"
200 INPUT IN$
210 IF IN$="Y" THEN 1110
220 CALL CLEAR
230 PRINT "  YOU HAVE CRASH
LANDED. NO OTHER PEOPLE HAVE
 SURVIVED. MAP ON GROUND.":
:
240 INPUT A$
250 PRINT
260 IF A$="TAKE" THEN 330
270 IF A$="N" THEN 420
280 IF A$="S" THEN 520
290 IF A$="E" THEN 610
300 IF A$="W" THEN 650
310 PRINT "YOU CAN'T ";A$
320 GOTO 230
330 PRINT "  THE MAP SHOWS A
 LARGE CITY TO THE NORTH AND
 A SMALL   NATIVE VILLAGE TO
 THE EAST. VILLAGE CLOSEST"
340 INPUT B$
350 PRINT
360 IF B$="N" THEN 420
370 IF B$="E" THEN 610
380 IF B$="S" THEN 520
390 IF B$="W" THEN 650
400 PRINT "YOU CAN'T ";B$
410 GOTO 330
420 PRINT "  YOU SEE A BOAT
ON A STREAM"
430 INPUT C$
440 PRINT
450 IF C$="TAKE" THEN 870
460 IF C$="N" THEN 760
470 IF C$="S" THEN 520
480 IF C$="E" THEN 610
490 IF C$="W" THEN 650
500 PRINT "YOU CAN'T ";C$
510 GOTO 420
520 PRINT "  YOU CAN'T GO SO
UTH"
530 INPUT D$
540 PRINT
550 IF D$="S" THEN 520
560 IF D$="N" THEN 760
570 IF D$="E" THEN 610
580 IF D$="W" THEN 650
590 PRINT "YOU CAN'T ";D$
600 GOTO 520
610 PRINT "  YOU ENCOUNTER S
OME       UNFRIENDLY NATIVE
S, WHO KILL YOU"
620 CALL SOUND(100,220,0)
630 CALL SOUND(200,120,0)
640 GOTO 1020
650 PRINT "  YOU COME TO SOM
E TALL     CLIFFS. YOU CAN S
EE SMOKE   IN THE EAST"
660 INPUT E$
670 PRINT
680 IF E$="E" THEN 610
690 IF E$="S" THEN 520
700 IF E$="N" THEN 420
710 IF E$="W" THEN 740
720 PRINT "YOU CAN'T ";E$
730 GOTO 650
740 PRINT "  YOU GO WEST AND
 FALL DOWN THE CLIFFS"
750 GOTO 620
760 PRINT "  YOU ENCOUNTER A
 DIRT ROAD"
770 INPUT F$
780 IF F$="S" THEN 650
790 IF F$="N" THEN 850
800 IF F$="E" THEN 850
810 PRINT
820 IF F$="W" THEN 850
830 PRINT "YOU CAN'T ";F$
840 GOTO 760
850 PRINT "  YOU ARE TIRED S
O YOU GO TO SLEEP ON THE ROA
D. TO BAD  YOU GET RUN OVER
BY A SEMI!"
860 GOTO 620
870 PRINT "  YOU TAKE THE BO
AT AND     PADDLE DOWN THE S
TREAM. THE STREAM PARTS, TO
THE EAST AND TO THE NORTH"
880 INPUT G$
890 PRINT
900 IF G$="N" THEN 960
910 IF G$="E" THEN 940
920 PRINT "YOU CAN'T ";G$
930 GOTO 870
940 PRINT "  YOU TURN THE BO
AT SO IT   GOES IN THE RIGHT
 WAY BUT   YOU SOMEHOW FALL
OUT AND DROWNED"
950 GOTO 620
960 PRINT "  AFTER AN HOUR O
F ROWING   YOU COME INTO THE
 CITY AND  YOU ARE RESCUED"
970 TONE=110
980 FOR COUNT=1 TO 10
990 CALL SOUND(-100,TONE,1)
1000 TONE=TONE+110
1010 NEXT COUNT
1020 FOR DELAY=1 TO 2000
1030 NEXT DELAY
1040 CALL CLEAR
1050 PRINT "   DO YOU WANT A
NOTHER TRY? (Y OR N)"
1060 INPUT H$
1070 IF H$="Y" THEN 220
1080 CALL CLEAR
1090 PRINT "B Y E  B Y E"
1100 END
1110 CALL CLEAR
1120 PRINT "  I N S T R U C
T I O N S   "
1130 PRINT
1140 PRINT "  YOU HAVE CRASH
ED ON A     TROPICAL ISLAND
AND YOU HAVE TO FIND CIVILIS
ATION SO YOU CAN SURVIVE.":
:
1150 PRINT "  BUT WATCH OUT
FOR         UNFRIENDLY NATIV
ES AND OTHER THINGS THAT WIL
L KILL YOU.": :
1160 PRINT "  WHEN A QUESTIO
N MARK AND THE CURSOR STARTS
 FLASHING   YOU HAVE TO ENTE
R A COMMAND.": :
1170 PRINT "  HERE ARE THE C
OMMANDS:": :
1180 PRINT "N FOR NORTH"
1190 PRINT "S FOR SOUTH"
1200 PRINT "E FOR EAST"
1210 PRINT "W FOR WEST"
1220 PRINT "TAKE TO TAKE THI
NGS ": :
1230 PRINT "PRESS ANY KEY TO
 START GAME"
1240 CALL KEY(0,K,S)
1250 IF S=0 THEN 1240
1260 GOTO 220
```

SOFTWARE

Are you FRUSTRATED when you don't see your TI-99/4A splashed all over the computer masazines, HA HA I say. The IBMs and MACs are what they call the BREAD & BUTTER of the computer industry.

If you have $500 to PAY for software like the one that made this page, well you don't have a TI-99/4A.

If you have $20 to pay then I know you are a 4A owner, I plan to stick with my TI until they develop the new BIOCHIP. So don't get sucked in by MEDIA hyre you do have a computer that will do MORE than the rest for a lot LESS cost and hassle.

MUSIC HARDWARE

A stand-alone MUSIC CARD has been in the works for a while and will possibly be made available to interested users.

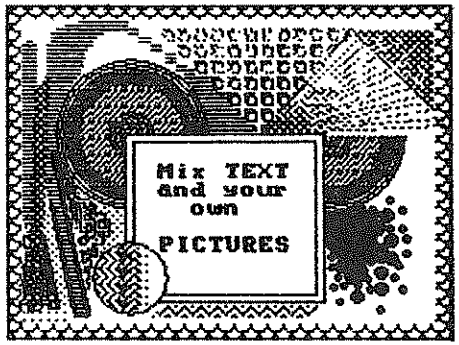
The card will give you 16 channels of sound with STEREO output.

The MIDI interface is now being developed to use PETER SCHUBERTS RS232 stand-alone. This means MIDI music control throush BASIC.

ONE-LINE DIRECTORY

by Arto Heino

```
100 OPEN #1:"DSK1.",INPUT ,RELATIVE,INTERNAL :: INPUT #1:F$,E,F :: PRINT F$;"FREE=";F;"USED=";E-F :: FOR H=1 TO 127 :: INPUT #1:F$,D,E,F :: PRINT F$ :: CALL KEY(0,K,S):: FOR Z=D TO D-D-(S<>0)*D :: CLOSE #1 :: H=127 :: NEXT Z :: NEXT H
```



DRAWN USING PICASSO

PICASSO PUBLISHER CAN USE YOUR TI-WRITER FILES AS SOURCE FOR TEXT, OR JUST TYPE STAIGHT IN. YOU CAN ALSO LOAD, SAVE & EDIT FONTS AS YOU NEED TO.

ENHANCED EXTENDED BASIC

What do you NEED when makeing DIAGRAMS in a XB program, well you can define HEAPS of CHARS and then HCHAR them on the screen or get a hold of ENHANCED EXTENDED BASIC to make your hard work easier.

I have written 17 links to take care of some much needed routines for your XB programs.

```
1. CALL LINK("ALLCHR",STARTCHR,ENDCHR)
2. CALL LINK("LASTCH",RETCHRVAL)
3. CALL LINK("SET",PIXELSTAT)
4. CALL LINK("PLOT",Y,X)
5. CALL LINK("LINE",Y1,X1,Y2,X2)
6. CALL LINK("CIRCLE",Y,X,RADIUS)
7. CALL LINK("COPY",Y1,X1,Y2,X2,Y3,X3)
8. CALL LINK("MOVE",Y1,X1,Y2,X2,Y3,X3)
9. CALL LINK("SWAP",Y1,X1,Y2,X2,Y3,X3)
10. CALL LINK("VPRINT",Y,X,YOURSTRING$)
11. CALL LINK("PEEKV",ADRESS,RT1,RT2 to RT15)
12. CALL LINK("POKEV",ADRESS,VL1,VL2 to VL15)
13. CALL LINK("WINDOW",STATUS,Y,X,WIDTH,YOURSTR$)
14. CALL LINK("INSERT",YRSTR$,POS,TARGETSTR$)
15. CALL LINK("REPLAC",YRSTR$,POS,TARGETSTR$)
16. CALL LINK("DELETE",POS,TARGETSTR$)
17. CALL LINK("CATLOG",DRIVENUM)
```

EXT/BASIC RECOVERY AFTER CRASH

by Arto Heino

USING LOAD INTERRUPT AND USER INTERRUPT VECTOR

```
        DEF   HELP,OLDXB
GPLWS   EQU   >83E0             GPL WORKSPACE
INTLOC  DATA  XB                ADRESS OF INTERRUPT
LNTAB1  DATA  0                 LINE NUM VECTOR STORAGE
LNTAB2  DATA  0                 LINE NUM VECTOR STORAGE
********************************
HELP    LIMI  0                 DISABLE INTERRUPTS
        MOV   @INTLOC,@>83C4    LOAD IN YOUR INTERRUPT
        B     @>006A            RETURN TO XB
*-------
XB      LIMI  0                 DISABLE INTERRUPTS
        MOV   @-31950,@LNTAB1   STORE LINE NUMBER VECTOR
        MOV   @-31952,@LNTAB2   STORE LINE NUMBER VECTOR
        RT                      RETURN FROM INTRPT TO XB
*-------
OLDXB   MOV   @LNTAB1,@-31950   RECOVER LINE NUM VECTOR
        MOV   @LNTAB2,@-31952   RECOVER LINE NUM VECTOR
        RT                      RETURN TO XB
QUIT    BLWP  @>0000            QUIT FUNCTION
*-------
        AORG  >FFFC             LOAD VECTOR ADRESS
        DATA  GPLWS,QUIT
        END
```

Assemble file as CRASHXB/O so you know what is in the file. How to use it:

```
CALL INIT :: CALL LOAD("DSK1.CRASHXB/O")
CALL LINK("HELP")
```

Now if your XB cart crashes Just:

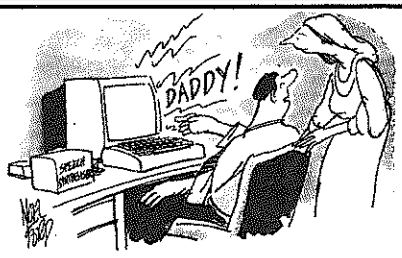
```
"PRESS LOAD INTERRUPT BUTTON"!!
SELECT XB
CALL LINK("OLDXB")
CALL LINK("HELP")
```

Your program should be INTACT if not just edit any offending chars.

I AM COMPUTER,

HEAR ME ROAR

By Barb Berg



'Its first word!'

If you have the Speech Synthesizer and a speech-accessable module, such as Extended BASIC, Terminal Emulator II, or a game such as Parsec or Alpiner, you have probably heard your computer talk to you at some time or another. Writing a program that includes speech is really not that hard, as you may have discovered. The TE II module allows text-to-speech, which makes it quite easy to have words or phrases "spoken" by the computer, and XBASIC allows allophones and uses the resident vocabulary of 373 words and phrases in the speech synthesizer.

But if you HAVE used the TEII for text-to-speech, you must have discovered that some words are pronounced incorrectly. Some words in our English language do not sound like they are spelled. Can you imagine the trouble a foreigner must have, trying to learn our language with words like tough and through? Both have the "ough" at the end of the word, but definately have different sounds.

This is similar to what happens with the speech synthesizer. While a lot of the common sounds (and many of the uncommon ones) are translated correctly, a few words manage to sound like they belong in some other language. I noticed this most when I wrote a simple spelling program for my kids to practice their weekly spelling words on. Where they go to school, they have to learn how to spell 75 words every week. My 6th grader just brought home a list with words I'd never even heard of, and most of the rest were words I didn't know until high school!

They have learned through the years that it helps to sound out a difficult word in order to pronounce it properly (or at least closely!). In the spelling program, I made allowances for words that didn't sound like they were spelled. I used two different variable arrays, one for the correct spelling of the word, and one for the correct pronunciation. If the pronunciation of the word was all right when entered as correctly spelled, it automatically went into the pronouncing array. If not, one could enter the word phonetically, or the way the word sounded. This spelling would go into the pronounce array only.

However, if you write a program which uses a lot of speech or uses words like these, you may decide that even those words that come out sounding ok are still not quite what you had in mind for that particular program. The TEII module has a very nice system for that purpose, in that the text is translated into allophones according to previously programmed speech rules, and these allophone strings are then changed into what the manual calls Linear Predictive Coding (LPC) strings. It is the LPC string that the speech synthesizer "speaks".

Now, I don't know about anyone else, but the default "voice" resident in the synthesizer sounds an awful lot like Marvin the Paranoid Android from the "Hitchhiker's Guide to the Galaxy" series shown on IPT a few years ago. This robot was a terribly depressed individual, and his voice sounded like he was ready to "pull the plug" on himself any minute. The speech rules in the TEII module include sentence intonations, but like Marvin, they make the voice sound like your computer just died and it's in mourning. You can change the pitch and slope, but even then it can sound like either a soprano Marvin (you can do your own jokes here, folks) or like him with a bass voice.

Reprinted from the Fairware disk TI SINGS.

So how can you make the voice more interesting? Well, you can include inflection symbols, which tell the computer that you want a stress on this word or that syllable, but that doesn't always help as much as I'd like. Or, you can vary the pitch and slope slightly within the sentence or phrase itself. I don't recommend the latter, as it makes the speech sound very choppy, like Mel Tillis when he tries to say something and can't get it out right away.

We have a program from the UG library that has a little robot character singing "Old MacDonald". In this program, the pitch and slope are altered according to the notes that the words are supposed to be sung on, and if you've seen and heard it you probably have noticed how choppy it sounds. Good effort, but frustrating to listen to, especially if the kids decide they want to sing along.

Well, where does that leave you? It doesn't sound like the TEII and speech can be programmed to sound very realistically, does it? Ah, but wait a minute! There are also allophones. But what are they, and how do you use them?

Allophones are simply the individual sounds of speech. Remember when you had to learn "long" and "short" vowel sounds? Well, they don't call them that anymore, I guess, but at any rate, each letter in the alphabet has one or more sounds, depending on what letters they are used in combination with.

For example, notice the difference in the combination "in" in the following words: in, insane, think, thing. In the word "insane", the i is spoken for a shorter length of time than the i in "in". The n is pronounced differently in the last two words than in the first two. We speak these words without giving thought to the length of time we hold the i, and "ing" and "ink" are second nature. And we may use a different inflection in our voice to set the mood of what we say. But the speech synthesizer can't do all of that by itself. If you want to say INsane instead of inSANE, you just do it! But you have to tell the speech synthesizer where to put the stress point in the word so it can say it the way you want.

But it looks so time consuming to program a sentence with allophones. Right? The following program is on page 40 of the TEII manual:

```
100 OPEN #1:"SPEECH",OUTPUT
110 OPEN #2:"ALPHON",INTERNAL
120 INPUT "PHRASE ":A$
130 IF A$="" THEN 120
140 PRINT #1:A$
150 INPUT #2:B$
160 Z=LEN(B$)
170 FOR R=4 TO Z
180 PRINT ASC(SEG$(B$,R,1))
190 NEXT R
200 GOTO 120
```

What this program does is a great time saver. File #1 opens a channel to the speech file, which speaks the words you enter for text-to-speech. File #2 opens the alphon file, which breaks the words down into allophones. When you run the program, you are asked for a phrase. Whatever you enter here is first spoken by the speech file and then input into the alphon file. The standard inflections and stresses make up the first three CHR$'s of the phrase. These include the sentence break code 250 and the number of secondary stress points before and after the primary stress point. Since all we want are the allophones for the words in the phrase, we start at the fourth CHR$ in the phrase and the computer displays the allophones for the words used. Now you can see what allophones are used in each word by comparing the screen display with the chart on page 41.

You can then take your word or phrase as broken down and do a variety of things to it. Add pitch and slope, change the vowel sound or the length of time it is held, alter the consonant sounds, whatever you want to do. When you make up the speech string from allophones to add to your program, the allophone numbers become CHR$ numbers. For example, take the word "the". The allophones used by the TEII for "the" are 95 and 18. CHR$(95) is the hard "th" sound to be used at the beginning of a word and CHR$(18) is a very short "uh" sound. Change CHR$(18) to CHR$(69) to have the "uh" sound held longer and for a more distinct sound. Now you can put "the" into a string variable:

```
A$=CHR$(95)&CHR$(69)
```

Want to add pitch and slope? CHR$(251) is the slope indicator and CHR$(252) sets up the pitch. The default values for pitch and slope are 43 and 128, resp ectively. We can add them to our string like this:

```
100 THE$=CHR$(95)&CHR$(69)
110 PITCH$=CHR$(252)&CHR$(43)
120 SLOPE$=CHR$(251)&CHR$(128)
130 A$=PITCH$&SLOPE$&THE$
```

If you don't understand the difference changing slope makes, or the formulae on pages 34-35 of the manual, then you should experiment with it a little. I have found that the lower the number the smoother the slope. If the slope is a high number, you get a rougher sounding voice. That isn't the right word to express it, but you really have to hear it to understand.

As for using the formulae to determine slope, first use the 32 * 10% of the pitch. If the pitch is 35, then 32*3=96, and that is what the manual says should be the best sounding. Now check this in the other two formulae: first, yyy<[xx-1]. With our values replacing the variables, the result is this: 96<[35-1] or 96<34 or 96<544. Definately true. In the other, yyy<[63-xx] becomes 96<63-35, or 96<28 or 96<448. You can see, this gives you a lot of room to work with when you use a low pitch. (The lower the number, the higher the pitch.) Just keep the slope under 255. The format in text-to-speech format is: PRINT #1:"//xx yyy" where file #1 is opened to the speech file, xx=pitch and yyy=slope.

Need stress points in your phrase? Use CHR$(253) for a primary stress in which the sound must rise and CHR$(254) for one in which the sound lowers slightly. CHR$(249) indicates a secondary stress point, which puts less emphasis on a syllable than the primary stress point. CHR$(250) should be used at the beginning of a sentence if stress points are used as this tells the computer how many secondary stresses there are both before and after the primary stress point. Can't understand how? Start your string with CHR$(250). Count the number of stress 2's come before your stress 1 (A). Now count the number of 2's after the 1 (B). Then use this form:

```
CHR$(250)&CHR$(A)&CHR$(B)
```

Continue to build your string from there. If the entire string is supposed to rise or fall, use either CHR$(254) or CHR$(255) after the CHR$(250). Then add a CHR$(A) where A = the number of vowels in the phrase. As an example, enter the following:

```
100 OPEN #1:"ALPHON",INTERNAL
110 A$=CHR$(250)&&CHR$(2)&&CHR$(1)&&CHR$(252)&&CHR$(
46)&&CHR$(249)
120 C$=CHR$(117)&&CHR$(34)&&CHR$(249)&&CHR$(74)&&CHR
$(67)&&CHR$(127)&&CHR$(254)&&CHR$(86)&&CHR$(50)&&CHR
$(249)&&CHR$(87)
130 C$=C$&&CHR$(82)&&CHR$(69)&&CHR$(127)&&CHR$(127)
140 B$=CHR$(250)&&CHR$(3)&&CHR$(0)&&CHR$(252)&&CHR$(
46)&&CHR$(249)
150 D$=CHR$(126)&&CHR$(118)&&CHR$(51)&&CHR$(249)&&CH
R$(50)&&CHR$(126)&&CHR$(249)&&CHR$(85)&&CHR$(46)&&CH
R$(127)
160 D$=D$&&CHR$(254)&&CHR$(73)&&CHR$(69)&&CHR$(98)
170 E$=A$&&C$
180 F$=B$&&D$
190 PRINT #1:E$&&F$
200 GOTO 110
```

Believe it or not, all this does is say "Hello, Barbara. How are you, love?" You can substitute the allophones for your name where the ones for mine are and change the pitch of the voice as desired. A$ sets up the sentence break, number of secondary stress points and the pitch, then indicates that the phrase will start with a secondary stress point. C$ is the first sentence. B$ does the same as A$ but it does it for the second sentence, D$. The main thing I want you to notice is how the number of secondary stresses are added after the CHR$(250) in A$ and B$. CHR$(249) indicates a secondary stress, and you will see that there are 2 of these before the primary stress in C$ and 1 after it. In lines 120 and 160, CHR$(254) is the primary stress point in each sentence and signifies a falling contour. CHR$(252) in A$ and B$ is setting up for the pitch parameter, CHR$(46). This is not the same as the allophone CHR$(46) in line 150. All other CHR$'s are allophones, also.

Now, how does the computer know that the CHR$(46) in A$ and B$ is not an allophone? Very simply, it is because of the CHR$(252). When the ALPHON file sees a 252 coming through, it knows that the next allophone is going to be the value for the pitch. Similarly, when it sees a 250 coming, it knows that the next TWO CHR$'s are going to tell it how many secondary stresses to expect. If a 254 or a 255 is used as the first parameter after a 250, then the ALPHON file assumes no secondary stresses are coming, the primary stress will be on the first syllable, and the CHR$ following the 254 or 255 will tell it how many vowels (or syllables) there are in the sentence. Here, 254 indicates the sentence will have a rising pitch and the 255 means the pitch will fall.

Completely confused? I was at first. It was a little difficult to understand how CHR$(254) could be both a rising and a falling contour until I realized that, like the allophones, what they indicate depends on the CHR$ they follow. Think about it a little; sooner or later it does sink in!

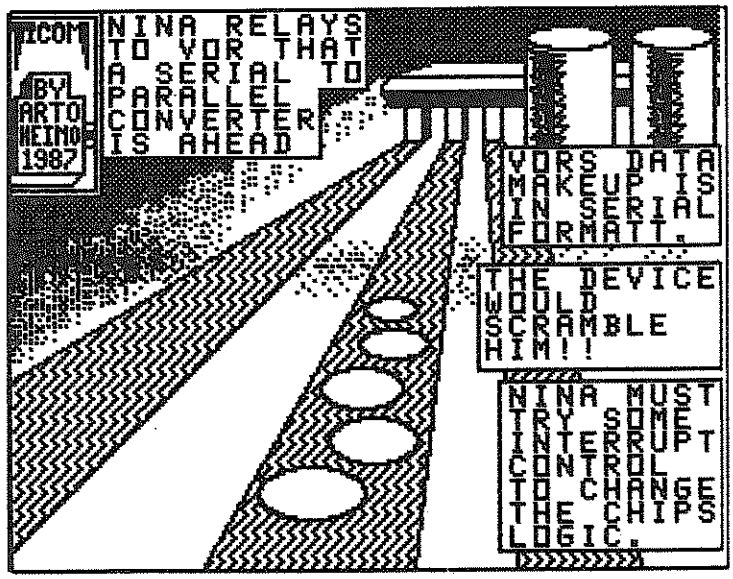
Now, if a CHR$(255) is used within the phrase itself (not in the sentence break parameters), it indicates a temporary pitch change. The CHR$ that follows it will tell the pitch for the next syllable ONLY.

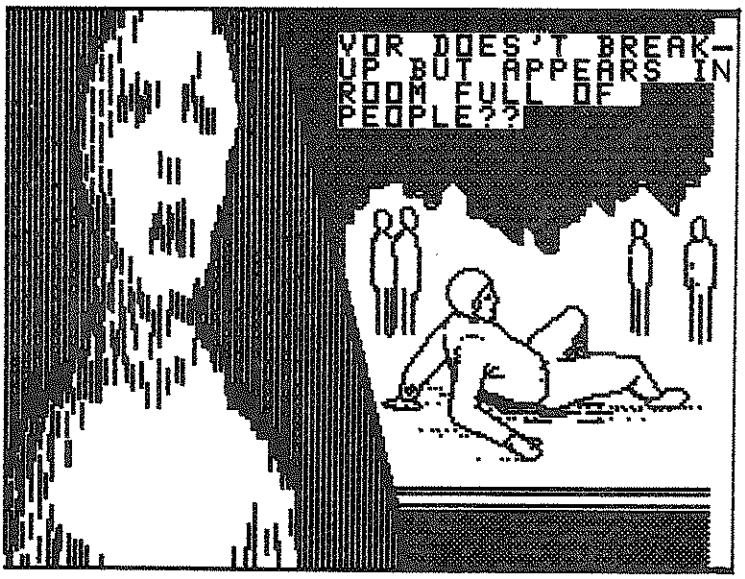
If you are beginning to get the idea but are still having a little difficulty grasping what I have said here, it may help if you try out the little "programettes" on pages 38-40 in the TEII manual, like the one I included earlier in this article. That's what I had to do to understand better how allophones are used! I don't understand why there aren't more programs with speech, especially when you really CAN do quite a bit with them.

Just for the heck of it, and partly because there are a lot of music programs around that show how the SOUND subprogram can be used, I decided awhile back to see if it was possible to make the computer actually sing. And I wanted a smoother result than good ol' Old McDonald. So I sat at the computer for hours on end, playing with the allophones, finding pitches to correspond with the CALL SOUND tones, and experimenting with slopes until I understood them to my own satisfaction. (When it comes to computers, I'm insatiable!) My first result was a program I called BEATSING, in which the computer sang "I Saw Her Standing There" and displayed an exceptional graphic of Paul McCartney. (No brag, just fact!) The time it took to write this program led me to write a driver program called TI SINGS, which allows anyone to enter a song

Continued on P19

The continuing story of Nina and Vor.





From P18

for the computer to sing. It also allows disk storage of completed songs. This article is also on the disk in TI-WRITER form, and with the completion of this article came the completion of the TI SINGS disk.

It is now available through Trio+ Software, and if this article piques your interest, it can be had "for a song". (Ba-a-ad pun--sorry!)

I hope this article gives you a start with programming speech with the TEII. My only disappointment with the speech system is that in order to write a program that uses the speech capabilities of the TEII module, one is limited to BASIC. Maybe someone out there will begin to see the possibilities with the speech system and design an extended BASIC with the speech capabilities of the TEII. I would have loved to be able to use some of the X-BASIC features when I wrote the TI SINGS program, but had to settle for BASIC. And it would have been nice to be able to access the 32K memory for longer songs. How about it, hardware developers?

```
100 ! ****************
110 ! *  BEAMHEADINGS *
120 ! * AMATEUR RADIO *
130 ! * SEPTEMBER '85 *
140 ! *  adapted for  *
150 ! *  for the TI   *
160 ! *  by A.Heino   *
170 ! ****************
180 CALL CHAR(123,"FFFFFFFFF
FFFFFFF",124,"55AA55AA55AA55
AA")
190 D=1 :: K=111.12 :: M=57.
2957795 :: N=60 :: S=69.86
200 DISPLAY AT(1,7)ERASE ALL
:"▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁":TAB(4);"▁▁
▁▁GREAT CIRCLE▁▁▁▁":"
▁DISTANCE & BEARING▁":"  ▁▁
▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁▁"
210 DISPLAY AT(6,1):"ENTER V
ALUES IN WHOLE":"DEGREES AND
 DECIMALS.":"USE MINUS VALUE
S FOR SOUTH":"LATITUTES & EA
ST LONGITUTES"
220 IF D<>1 THEN 280
230 A=-34.28 !   YOUR LAT
240 A=A/M
250 L1=-150.29 ! YOUR LONG
260 DISPLAY AT(11,1):"ENTER
DX QTH"
270 ACCEPT AT(11,15):A$
280 DISPLAY AT(14,1):"LATITU
TE" :: ACCEPT AT(14,12):B ::
 B=B/M
290 DISPLAY AT(17,1):"LONGIT
UTE" :: ACCEPT AT(17,12):L2
300 L=(L1-L2)/M
310 E=SIN(A)*SIN(B)+COS(A)*C
OS(B)*COS(L)
320 D=-ATN(E/SQR(1-E*E))+1.5
7079
330 C=(SIN(B)-SIN(A)*E)/(COS
(A)*SIN(D))
340 IF C>=1 THEN C=0 :: GOTO
 360 ELSE IF C<=-1 THEN C=18
0/M :: GOTO 360
350 C=-ATN(C/SQR(1-C*C))+1.5
7079
360 C=INT(C*M)
370 IF SIN(L)<0 THEN C=360-C
380 R=180+C
390 IF R>=360 THEN R=R-360
400 R=INT(R)
410 CALL HCHAR(6,1,32,32*18)
420 LLA=LEN(A$):: LLB=28-LLA
 :: DISPLAY AT(6,LLB/2-1):RP
T$("½",LLA+2):: DISPLAY AT(7
,LLB/2-1):"½";A$;"½"
430 DISPLAY AT(8,LLB/2-1):RP
T$("½",LLA+2)
440 DISPLAY AT(10,1):"BEARIN
G";C;"DEG (SHORT PATH)"
450 DISPLAY AT(12,1):"BEARIN
G";R;"DEG (LONG PATH)"
460 DISPLAY AT(14,1):"DISTAN
CE";INT(N*D*M);"NM"
470 DISPLAY AT(16,1):"DISTAN
CE";INT(S*D*M);"MILES"
480 DISPLAY AT(18,1):"DISTAN
CE";INT(K*D*M);"KM"
490 DISPLAY AT(22,1):"PRESS
ANY KEY TO CONTINUE..."
500 CALL KEY(0,KEY,STAT):: I
F STAT=0 THEN 500
510 GOTO 180
520 END
```

AN 8K-89K/256K PIO PRINT BUFFER

A Hardware review by John Paine.

Recently while chewing the fat with a couple of good friends from the Melbourne Users group a certain product that has been around for some time was brought to my attention. This product was a printer buffer short form kit which claimed to do almost everything other than type your text.

As to the claims, all I can say is that it does live up to the advertised claims and and any person who wants the facility of a print buffer would have to go a long way and pay a lot of extra dollars to beat this little gem.

I have just completed the 256k version of this kit and it does all that I expected of it. I would like to paraphrase Bill Perreau of the Melbourne Group who bought this little beast to my attention and who in the January edition of the Melbourne Times wrote a review of this buffer. Bill's words describe the buffer as I would have wished and I will use some of his prose in this review.

Firstly, I reckon I should explain to those of you that may not know what a print buffer is and how it operates. A print buffer is a 'BLACK BOX' that plugs between the PIO or RS232 port of a computer and the actual printer. This BLACK BOX is really another little computer with its own memory and monitor program (in Eprom) which will accept data from the host computer at normal memory transfer rate and in turn direct this data via its own I/O to the actual printer. So what, you may ask, The key to it's efficiency is that the transfer to the buffer takes only a few seconds and then returns control of the host computer, so that other work may be done. In the meantime the buffer is casually feeding the information in its memory out to the printer which is working it's little you know what out. In terms that fellow TI users may relate to, the formatter will squirt you document out to the buffer and return the finished prompted in only 2-3 seconds for an average 30 sector text file. The formatter is now ready for you next document and depending on how large the buffer is in terms of memory, you can continue to feed data into it. Meanwhile the printer prints on.

There are currently a couple of print buffers available and dedicated to the 99/4a. These are the CorComp Triple Tech card which has an inbuilt 64k print buffer and which plugs into the PE box, and the Myarc RamDisk which can have some of it's memory dedicated to print buffer. The buffer under review is a third type, that is, a complete stand alone type which can be used on any computer system with a parallel printer port.

The buffer has a unique name, 'PBUFF' and is based on a Z80a microprocessor and has a maximum memory base of 256K. Those of you that use RS232 instead of PIO need not despair, as there is an adaptor board available which will allow the 'Pbuff' to operate with serial input and output.

What's in the Kit.

The Pbuff kit comes with a comprehensive instruction sheet and lots of good advice on how to construct the kit. You get a printed circuit board and one of three Eproms, one for the standard 8k-64k memory, one for 256k memory only or one that contains both of the former. The kit is easy to assemble using the sheets provided. There are some 32 wire links to be soldered, 13 IC sockets to be fitted (Assuming 64k or 256k version) and a few resistors and capacitors. Please note that kit is a short form kit only and you will have to pick up some of the other parts yourself. When the parts have been fully installed, the instructions give you a step by step power up sequence and if you have a problem there is even a "IT DO NOT WORK DEPARTMENT".

Connecting Pbuff to a Centronics/Parallel Printer.

My current printer is a STAR Gemini Clone which is IBM/Epson compatable, and the following connections work just fine. If you have an Epson, TI, Amust, BMC or similar machine then these connectios will also work for you.

PBUFF (OUTPUT) Desc.	PIN	PRINTER PIN	Desc.
Strobe	1	1	Strobe
Data 0	2	2	Data 1
Data 1	3	3	Data 2
Data 2	4	4	Data 3
Data 3	5	5	Data 4
Data 4	6	6	Data 5
Data 5	7	7	Data 6
Data 6	8	8	Data 7
Data 7	9	9	Data 8
Ack	10	10	Ack
Busy	11	11	Busy
Gnd	12	12	Gnd

At this stage, without the computer connected you can power up and press the TEST button and if all is well a test message which comprises of the designers name and address will be printed out with a brief indication of free memory available. If the ROM is faulty a checksum error will also be printed out.

Connecting The Pbuff to the 99/4a

The TI, CorComp and future TIsHUG parallel port all share the same type of output connector.(I have not seen the Myarc or Mechatronic version as yet and the Axiom uses a standard Centronics Plug).The connector is a 16 pin IDC type plug and will have to be connected as shown below.

TI 99/4a Desc.	Pin	PBUFF (input) Pin	Desc.
Strobe	1	1	Strobe
Data 1	2	2	Data 0
Data 2	3	3	Data 1
Data 3	4	4	Data 2
Data 4	5	5	Data 3
Data 5	6	6	Data 4
Data 6	7	7	Data 5
Data 7	8	8	Data 6
Data 8	9	9	Data 7
Ack	10	11	Busy
Gnd	16	12	Gnd

Continued on P22

GROMS, What are they?

A look at TI's Specification.

John Paine, Technical Co-ordinator.

The following information was supplied from the Club library and is available to all financial members of the library.

What is a Grom, where are they and what do they do ? A detailed functional description will follow later but to answer the first question, a Grom is a GRAPHICS READ ONLY MEMORY device that is found in the console, all TI cartridges (excluding third party modules) and in the PCode card.

Groms are not directly accessed as part of CPU memory but in a similar manner to the VPD and sound chips. That is by a method known as memory mapping which is not really part of this brief description. The Grom is the device that allows the TI to have such powerful capabilities for a machine that as standard has only 256 bytes of CPU memory in it's unexpanded form. That is correct, the console you bought some years ago was not really a 16k machine but only 256 bytes. The 16K was in video display ram not CPU ram and now you can tell you friendly C64 neighbor that all this time he has been rubbishing your '16K' machine, that he was wrong, It is actually smaller than his earlier VIC whatever.

TI by using Groms and memory mapping techniques has actully built a standard console with 18K grom, 8K of system Rom , 16k of video Ram, 256 bytes of system Ram, a further 30k of grom and 16k of Rom through the cartridge port and 32k of expansion memory and 8k of DSR space in each peripheral card. This adds up to over 100k of application memory space available to a 64k processor chip (TMS9900). Not bad !

Any way, getting back to the story at hand, the Grom (TMS 0430, that is the name TI gave it,) is a 6k by 8 bit Rom with an autoincrementing address register. The 3 most significant bits (MSB) of the address register are mask programmable (i.e. programmed at time of manufacture) for a one out of eight page select. Operation is initiated by CE* (ie chip enable inverted) active low state which starts an internal state time sequence.

The grom interfaces to the CPU through the parallel data bus and memory control lines. The CPU interface consists of 8 data I/O lines, D0 (MSB) through D7, chip enable (CE* active low), a clock with a typical frequency of 447.4 KHz, and two mode control lines (M0, and M1).

When CE* becomes active, the mode lines M0 and M1 determine which one of four grom I/O operations will ensure. these are,

M0	M1	Operation.
0	0	WRITE DATA. Write data operation is something TI planned for the future and was included to allow for loverly devices like Gramkracker, and grom/gram emulating devices. This future operation would cause the address register to be incremented and the address byte would be fetched and put into the grom data register.
0	1	READ DATA. The read data operation transfers the contents or the data buffer register to I/O bus if the grom is in the current page. Next it sets ready to the off state. The adress register is then incremented, the newly addressed data is put into a sense amp latch register , and now the grom chip is ready for the next cycle.
1	0	WRITE ADDRESS. The write address operation transfers the data byte on the grom data I/O bus to the LSB of the grom address register. The old address register LSB is transferred to the address register MSB, and if it is the second address write, the newly addressed byte is fetched and put in the sense amp latch register, and the address register is incremented.
1	1	READ ADDRESS. Read address operation causes the MSB of address register to be transferred to the I/O data bus and ready goes to off state. The LSB of the address register is then transferred to the MSB of the address register to await the next read operation

It should be noted that the M0 control line selects between the address register and grom data register, and that the M1 line selects between a read and write operation.

GROM PAGING

The grom has a 16 bit address register of which the lower 13 bits form a counter needed to address the 6144 byte Rom matrix. The MS three bits are used to select one of eight grom pages. Each grom has a fixed 3-bit masked programmed page number which is determined during manufacture. The grom compares this number with the address register page select filed. If a match occurrs, then the grom is the "current" page. Both the data and write address operations are not affected by the page select field, and this operation always occurs if CE* is active and M0 and M1 are correctly set. It is only the read data operation that is affected by the page field in that only the current page grom will gate data to the system data bus (even though all other groms will go through the motion of getting more data from the rom matrix array).

The page select field permits up to eight groms to be connected in parallel. Since the page select field controls only the data output buffers for a ready data operation, all paralleled groms will be synchronised folwing initialisation. However, since only one grom is the cuurrent page, it alone can gate data to the data bus for a read operation, even though all the others conected in parallel with that one will go through the motions of carrying out the M0/M1 selected operation.

READY.

The grom ready line is a status output that issued to notify the CPU when that portion of the grom State cycle is completed. All ready outputs must be connected together to compensate for device non uniformity and grom clock skew.

ADDRESS REGISTER AUTO-INCREMENTATION.

The address register shall be auto incremented for the following three conditions:

1) After a data read operation.
2) After a write data non operation (see above)
3) After a write address pair of operations which follow either a data read or data write or address read operation. Interestingly TI specified that the address register should count through the full 8k sequence (16 bit address as noted above), but address only 6k bytes. The data definition above a 6k count was to be undefined. This full address count has enabled grom/gram emulation devices like GramCarte and MG GramKracker to work as they do. Did TI envisage that at some time in the future they where going to release similar types of products? If not, why was the cartridge port only partially decoded?...

INITIALISATION.

During a cold start or power up sequence, the console must execute a "dummy" read data operation to reset the mode flag which guarantees that the groms will not respond to the first write address command as it does to the second one. When the dummy read data has been executed, the address register may be correctly loaded with a pair of write address commands. b y the same reasoning, the address register may not correctly read unless a read data or a write data operation has occurred just previous to the read address request.

Continued on P22

PIO EXPANSION PORT

by P.Schubert

I have just finished testing a new small add-on "PIO" port for the basic console system. It does not need external power or 32K memory, and plugs into side of console.

It is TI standard in operation so will work any parallel printer, and for convenient screen dumps to printer has a LOAD-INTERRUPT SWITCH built in (this version courtesy Geoff Trott). This version also has a built-in self test feature which outputs the full ASCII char set.

At present this board does not allow daisy-chaining of peripherals, and a version for the new MINI-PE BOX will also be made.

Price of the complete stand-alone board with Rom onboard is $55, and a PRINTER CABLE to suit is $18. Price of the MINI-PE BOX version has not been determined yet. For more information contact;

Peter Schubert
P.O.Box 28
Kings Cross 2011
(02)358 5602

Arrangements can be made to examine this device (and others made by me) with your local REGIONAL MEETINGS co-ordinator.

From P21 Groms

At this stage you should be up and running, and use some of the very good features of PBuff. Some of these features are listed below::

RESET Press this button to clear the buffer or abort the current print session. One note of warning though, if your printer has it's own inbuilt 1 or 2K buffer then you will have to turn your printer offline to stop printing immediately. Normal power up executes a RESET.

COPY ON / COPY OFF . This switch allows multiple copies of what is stored in Pbuff. The file to be copied is from the last RESET or Power up.

HEXADECIMAL Print out will be in HEX rather than ASCII.

SOFTWARE PAUSE. This feature can be initiated by sending down a double backslash (\\) string (HEX 44). The buffer will continue to accept data but the actual printer will stop. The COPY ON switch will reactivate the print.

HARDWARE PAUSE. This is an optional switch which allows the buffer to be filled with the printer offline. You can change printers without the loss of data.(EDITOR....Eat your heart out).

As mentioned earlier I have constructed the 256K version of PBuff only because I had the necessary chips available. A 64K version of Pbuff should cost in the order of $100.00 total including the shortform kit. At this stage let me tell you "HOW TO GET IT".

PBUFF is an Australian Designed Product and is available from;

Mr Don McKenzie
29 ELLESMERE CRESCENT
TULLAMARINE, Vict. 3043
Telephone (03) 3386266

and the shortform kit will vary from $39.00 to $42.00 plus a postal charge of $3.00, depending on the version you want.

Give him a call, you will find him to be a very helpful and obliging gentleman.

From P20 Print Buffer

Now that we are all experts on Groms (!!!!) lets just have a quick look at where they are in our system and their page numbers.

Page 0.....Operating system of Console
Page 1.....First part of TI Basic in Console
Page 2.....Second part of Basic in Console
Page 3-7...Mapped into cartridge port of Console.
ie EXTENTED Basic occupies pages 4-7.
Editor Assembler occupies page 4
MiniMemory page 4.

Now you may understand why cartridges with the same page numbers cannot be connected at the same time.

As stated earlier in this little discussion, the source material is available from the club library. The specification sheets have numerous timing charts and figures to better explain what I have endevoured to

Happy foraging,

John Paine.

MYSTERY FUNHOUSE

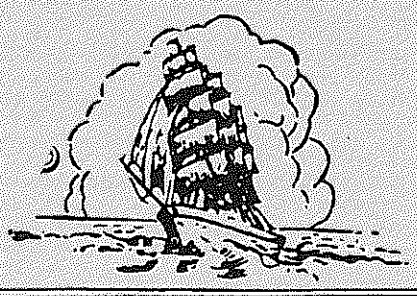
Part Two

Once in the barrel room, get the match and the comb, then crawl (that's how you get out of the barrel). Drop the match by the trampoline, then head South to the rickety stairs and down to the landing. Go down the slide into the tank. Get the rusty key, then give the comb to the mermaid. Go up the secret stairs she reveals, and you will be back on the landing.

Go East into the Windy Hall, and East again into (sigh) the maze. Now, carefully make your way South, East, South, East, and you will be in the Mirror Room again. Wear the spectacles, and look in the mirror. Sonuvagun! There's a hidden door! Open the door and go inside. Here you find a valve handle. Drop the spectacles and get the handle, then go East back to the mirror room.

Once again, go through the maze to the room with the knobs. Drop the key, then continue on West and then up until you come to the ledge. Get the trampoline, then go down the ladder to the pit. Drop the trampoline, then put handle and turn handle. You have now turned off the calliope in the merry-go-round room. You're back up on the ledge.

Get the match, and return to the knob room. Drop the match, get the key, and pull the blue knob. Now you're in the room with the Fortune-telling machine. However, it won't be telling your fortune today, because it's broken. However, in an odd sort of way, it's going to be very helpful to you. But right now, go on along East to the merry-go-round room.



REGIONAL GROUP NEWS

BANANA COAST REGIONAL GROUP - REPORT
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The fourth meeting of the Banana Coast Regional Group was held at the home of Keir Wells in Bellingen on the 26th of April. This meeting saw the introduction of three newcomers, Alan Holmes and his young son from Dorrigo and Kevin Clancy from Sawtell.

All of the Groups members bar one attended the meeting and with our three new members our current strength now stands at eleven. The growth potential of the group is only now really being appreciated by all of us. All of our members are speaking to friends and acquaintances who have TI's tucked away in closets and corners.

The meeting commenced with a great deal of interest shown in the ALL ads downloaded from the TEXPAC Bulletin Board. The outcome of all this interest was Keir Wells spending a great deal of time on the BBS corresponding with people who had placed items for sale on the system. We would like to take this opportunity to thank all those members of the BBS who responded so quickly to the inquiries made of them.

Kevin Cox, having recently installed his onboard 32K memory expansion, brought along his system and displayed for all some of the excellent programmes in Memory Image format that were kindly sent to him by the Illawarra Regional Group. Once again, many thanks are expressed to G. Meldrum of the Illawarra Regional Group who kindly sent Kevin the programmes.

If any member of any TI Group wishes to drop in on one of our meetings then feel free to contact either:

Keir Wells (066)55-1487; or

Kevin Cox (066)53-2649.

CARLINGFORD REGIONAL GROUP REPORT

The Carlingford regional group held its meeting on 15 April. A number of members attended and Albert Anderson (HV Secretary) was present as a visitor.

Shane Ferrett commenced the evening with his tutorial on Assembly Language with a discussion on the control of the "PIO" port. Shane painstakingly explained the function of each line of source code in the programme he used as an example. Thank you Shane.

Members also saw the public "premiere" of the mini/expansion system which has been developed by John Paine, Peter Schubert and others. The cards are approximately 11cm X 15cm and plug vertically into one another. The "System" then plugs directly into the expansion port on the side of the console. The whole thing is very compact. It is equipped with its own power supply however for the demo. John powered the system from the console power supply. (You can imagine how portable that makes it). The disk controller card was connected to two Mitsubishi Drives and worked perfectly. The disk drive card is able to handle single and double sided drives and to format as single or double density. It will also handle file transfers from one format to another.

The drive card also has a number of inbuilt commands which enable it to do virtually any programme handling function performed by the Editor/ASsembler cartridge. This is achieved by a simple CALL from BASIC. There are resident in the card. The "system" is most impressive - in both size and capability. Price has yet to be determined. Production is expected in the very near future.

LIVERPOOL REGIONAL GROUP

Was held at Cyrils place with a reasonable turnout of members considering the weather was bad. Thanks Cyril for cuppas and yummies.

The very prolific John Paine debugged and fixed a consol, he also checked the Ram disks of members who assembled there own.

Robert Pevrill showed his Ram card in which he had installed sockets for the Ram chips and a socket for the extra Ram jumper logic, this means his card can be not only easily fixed but be converted back to standard formatt.

The FORTI stand-alone card demo wasn't fruitful due to the CORCOMP micro-system not having a +5 rail at the through way edge connector.The FORTI software was briefly shown.

Arto gave a demo of his PICASSO PUBLISHER, it looks like members will be very productive with his package. He also demo'd a very small Load interrupt routine for XB users.

NEXT MEETING AT - Stan Puckles
- Richmond st.
Campbelltown
PHONE- (046) 256157
DATE - 12/6/87
TIME - 7.30pm

**********FLASH for TECHO-TIME**********

60 WAY female sockets same as the ones inside the PE-BOX are now available and specially ordered for us by:

HI-COM UNITRONICS
7 PRESIDENT AVENUE
CARINGBAH
Ph. 524 7878

THE CENTRAL COAST REGIONAL GROUP.

We wish to notify the members about the change of location as the meeting place for this group.

We will now meet at the Club Room of the Toukley Tennis Club at Header St, toukley (Next door to the Toukley Swimming Pool.)

As we have to pay $20-00 for the hire of the hall for the night. Therefore to cover this money the entry fee to the meeting will be increased to $3-00 per family.

The meeting will start at 6-30PM.

ILLAWARRA Regional Group.

Regular meetings are held on the third Monday of each month starting at 7.30pm at Keiraville Public School, Gipps Rd, Keiraville. Opposite Keiraville Shopping centre.