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# NEWS DIGEST

Focusing on the TI-99/4A Home Computer

Volume 6, Number 7

August 1987

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# TISHUG NEWS DIGEST

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

AUGUST 1987

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### MEMBERSHIP AND SUBSCRIPTIONS:

Joining Fee.....\$ 8.00  
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Publications Library....\$ 5.00  
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BBS Membership:  
Other TI User Group  
Members.....\$10.00  
Public Access.....\$25.00

### GROUP GENERAL MEETING:

First Saturday of each Month at  
Shirley House, Church Street,  
Burwood. Starts 2pm

### COMMITTEE MEETINGS:

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



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Occasionally when a good program comes onto the market it creates initial excitement. The locally produced "Picasso" falls into that category, if discussions at the club meetings are any guide. And so, several months after its release, it is worthwhile to critically examine it. With that in mind a competition is launched to provide graphic detail of its capabilities.

Subject matter can be anything that can be published in this newsletter. Entries can either be in hard copy or disk files. Forward entries to: PO Box 214, Redfern, NSW, 2016 or hand in a the monthly meeting.

The closing date is the October general meeting with the winner announced in the November TND. The Winner, at this stage, will receive free entry, to the nearest local regional group meeting, with a standing ovation.

Please feel free to add any comments about your use of the program and its worth.



# CO-ORDINATOR'S REPORT

.... Chris Buttner

The way is now clear to incorporate the club following your approval of the 5 nominations. The incoming directors will be Terry Phillips, Bert Thomas, John Paine, Peter Schubert and myself. Thank you to those country members who took the time to ring me.

If you have recently acquired a TI99/4A or simply want to bone up on your Basic and Extended Basic programming skills, don't miss this meeting in August. We will be running two classes so there should be scope for everyone. Don't forget to bring along some of your own work on either tape, disk or paper. It is much easier to deal with problems you may be experiencing if you do this. Sometimes we tend to think there is only one problem which stops the programme running but this is often not the case. To get the most out of it, bring some original work so we can clearly show you where you are going wrong or perhaps even suggest a way to improve your programming skills.

I am very happy with the response from those software authors, particularly overseas, who have acknowledged receipt of the grants made by the club. Don't forget to make your contribution to the author: the money from the club is NOT a substitute for your "shareware" contribution.

The response to the RamDisk project has been nothing short of staggering. In excess of 115 circuit boards have been sold. It evidences a very solid commitment to the TI and perhaps a realisation by many that to home use, the TI is amongst the best. There is always a temptation in the face of glossy advertisements and hype about other machines, to loose sight of the environment for which our computer was designed.

Arto Heino has now passed his "PICASSO" program to the shop and it may now be purchased over the counter; by mail or phone order. The price is unchanged at \$20.00.

The present committee has now been working for 6 months and hopefully we have satisfied the needs of most of you. However, if we are missing the mark, please let us know so we can correct the situation. You can write to the committee via the Secretary or if you are a BBS member, leave a message for Terry as Secretary or myself as CoOrd.

With the change in magazine format and production we requested help from the regional groups in designing covers which reflected the areas in which the groups operate. So far we have had to rely on the ingenuity of the editor so if you are from outside the Sydney area (such as banana growing country on the sunny north coast) send in your artwork and participate in the production of the magazine.

Once again we have had a few hiccups with the Woodstock venue. This August meeting is to be held in Shirley House commencing at 2.00pm.

If you have been toying with the idea of a printer buffer and missed our first order, get in touch with Cyril (Shop) as soon as possible so he can place the order for the circuit boards. As with most things, its first in best dressed and this particular project is no exception.

Project cost will rise in the future due to the increased sales tax now payable on chips (up from 20% to 30%). This is likely to add somewhere in the vicinity of 9% to the overall cost of your project.

Don't forget to keep in touch with your regional group. Firstly, they are smaller so you can usually get more individual attention with your problems or queries, they are quite informal and above all are organised for your benefit. ●

MINUTES - SPECIAL GM 4/7/87

## 1. OPENING

Co-ordinator, Chris Buttner opened the meeting welcoming those in attendance at 2.20pm

## 2. APOLOGIES

The following apologies were received by the Secretary:

Tony Beuermann  
Steven & Jenny Carr

## 3. NOMINATIONS FOR DIRECTORS

There were 3 nominations at the opening of the meeting, with a further 2 received from the floor after the duties were outlined by Chris Buttner. Nominations received were:

Chris Buttner  
Bert Thomas  
Terry Phillips  
John Paine  
Peter Schubert

As there were no further nominations the above mentioned 5 members were declared elected.

## 4. OTHER BUSINESS

Chris Buttner advised of his recent trip and Brisbane and discussions there with the local TI Community.

Terry Phillips advised of current available software from the shop

John Paine advised members were welcome to observe an Eprom programming/burning session he would be conducting in an adjoining room. John also advised that 100 blank Eproms had been purchased for future needs in repairs to consoles/cards etc, and that a further 50 boards for RAMCARDS had been ordered. To date 117 RAMCARDS had been made.

Ross Mudie advised of a drop in the call rate to the BBS and that ads now placed on the system would be available for perusal at meetings. If non BBS users wish to place ads on the system then they are quite welcome to do so. The TULPI modem is not yet being used because of incompatibility with the software download area of the system.

## 5. CLOSE

Chris Buttner thanked all for their attendance, and there being no further business closed the meeting at 2.55pm. ●

## ILLAWARRA REGIONAL GROUP



A special thanks is extended to Terry Phillips for his help in copying a large number of disks for our regional group. The disks are made available at meetings and credit duly commended to TISHUG and Terry Phillips.

As usual our regular meeting is held on the third Monday of each month. The next meeting date is on the 17th of August at 7.30 pm at Keiraville Public School, Gipps Rd, Keiraville (opposite Keiraville Shopping centre).

## \* Secretary's Notebook \*



*Terry Phillips*

Well finally, 5 directors have been elected to guide TISHUG into incorporation. The lucky volunteers elected at the Special General Meeting in July were Chris Buttner, Bert Thomas, John Paine, Peter Schubert and myself, Terry Phillips. Let's hope we have a smooth run into incorporation and that this move will enable us to serve you, the members, better.

Only 2 new members to welcome this month, and they are:

J Banfield - Armidale  
G Warner - Lesmurdie (WA)

Mr Banfield has designed several plug in ROM modules for the TI, and he was kind enough to send one down to us to have a look at. I have passed it on to our Technical Co-Ordinator, John Paine, to have a look at and comment on. Thanks for this Mr Banfield.

Members will, no doubt, be interested to know that our current membership stands at exactly 300 financial members. 4 memberships expired during the past month and have not been renewed. The Bulletin Board currently has 109 financial members, but 4 of these have not responded to my letters to supply a Username and Password. If the following 4 members read this would they please get in touch with me to supply the needed details:

Paul Bassett - Springwood  
Bret Hales - Roseville  
Phillip Haynes - Mortlake  
Peter Robinson - Queanbeyan

All members are again reminded that the current and only address for all correspondence to TISHUG is PO Box 214, Redfern NSW 2016.

A good number of Interstate and Overseas news digests were recently received and have been passed onto the Publications Librarian, Warren Welham. Warren has the complete library at each meeting and will be happy to let anyone browse and if you have paid your \$5 library subscription, borrow anything in the library.

That's it for this month. But remember both the Sysop and Editor and always on the lookout for material, so if you come across, or have written an article or program, send it in for publication.



Following on from my request in the software column a couple of months ago, several members wrote to me advising that they had only been with TISHUG a short time, and that they would like to see issued 'A Best Of' the earlier series of tapes. This is fine by me, but rather than myself arbitrarily deciding what's the best I thought I would start by publishing a list of what was on Tapes 1 to 10 and let you decide what you wanted. The list appears with this article. Tapes 11 to 20 will be subject to a separate article later in the year depending on the response rate to this first up effort.

Here's what you do. From the list pick a maximum of 8 programs you would like on each tape. For each tape you want send \$4 to the group address and please allow a turn around time of about 2-3 weeks. This will depend on volumes of orders I receive.

TAPE	CONTENTS	BRIEF DESCRIPTION	LANG.	
1	Name That Bone	Body Bone Tutorial	B	
	County Fair Derby	Horse Racing Game	B	
	Draw Paint	Drawing Utility	B	
	Life Expectancy	How Long To Go?	B	
	Mutant Maze	Avoid the Monster	B	
	Othello	Classic Board Game	B	
	Spider	Avoid the Spider	B	
	Tiny Math 1	Young ones Education	B	
	2	Blockade	Board Type Game	B
		Camel	Text Adventure	B
Co-ord Geometry		Educational Quiz	B	
Jumping Jack		Jump Gaps	B	
Jedi Pilot		Star Wars Space Game	B	
Fire Fighter		Strategy Game	B	
Yahtzee		Classic Dice Game	B	
Alphablox		Puzzle	B	
3		Artillery	Shooting Game	B
		Backgammon	Good Board Game	B
	Capitals	USA States Quiz	B	
	Dragonmaze	Maze Escape Game	B	
	Earth Attack	Space Game	B	
	Herald Angels	Musical Carol	B	
	Jingle Bells	Christmas Music	B	
	Safety	Safety Tutorial	B	
	Snoopy Xmas	Music & Graphics	B	
	4	Acey-Ducey	Good Card Game	B
Boggle		Strategy Game	B	
De-Fuser		Disarm the Bomb	B	
Forest Fire		Strategy Game	B	
Going Home		Strategy Game	B	
Match Pair		Match Hidden Pairs	B	
Space Laser		Space Game	B	
Tunnel Vision		Difficult Maze	B	
5		Alien Destroyer	Good Space Game	XB
		Aussie Fighter	Air Warfare	XB
	Chicken Helper	Cross the Road	XB	
	Euchre	Card Game	XB	
	Marksman	Shooting Game	XB	
	N-Vaders	Space Game	XB	
	Space Battle	Space Game	XB	
	Upscope	Submarine Warfare	XB	

6	Deep Space	Text Space Adventure	XB
	Alphabet	Early Learning	XB
	TI Maths	Educational	XB
	Corner Wars	Fast Shooting Game	XB
	Ear Trainer	Music Tutorial	XB
	Say & Spell	Educational	XB
	Read Fast	Speed Reading	XB
	Beethoven Music	Good Music/Graphics	XB
7	Gallery Bugs	Unusual Sprite Demo	XB
	Rubic's Cube	Scrambled Cube	XB
	Word Processor	Tape Version	XB
	Medical Records	How much Spent	XB
	Math Practice	Educational	XB
	Balloon Voyage	Pilot Balloon	XB
8	Cacti Kill	Avoid Cactus	XB
	Donkey Tail	Pin the Tail On	XB
	Duck	Climbing Game	XB
	Golf	Sports Game	XB
	Hot Dog	Road Crossing Game	XB
	Pompeii	Difficult Board Game	XB
	Trapshoot	Target Shooting	XB
	Zanquest	Space Game	XB
9	Alien Attack	Space Invaders Game	XB
	Bizmark	Naval Warfare	XB
	Darts	Indoor Sports Game	XB
	Skip to the Loot	Like Donkey Kong	XB
	Mazzo	Good Maze Game	XB
	Molasses Man	Like Pac Man	XB
	Piring Squad	Throw Bananas	XB
	Rescue	Space Game	XB
10	Astronomy	Educational	B
	Australian Cities	Educational	B
	Bowling Math	Educational	B
	First Math	Educational	B
	Homonyms	Educational	B
	Physics	Educational	B
	Time Clock	Educational	B
	Who am I	Educational	B

OK, so if you like the look of any of that lot then get your order into me as soon as you can.

Normal releases for the month of August will be the following:

#### ON DISK:

MODULES1 - containing some excellent work from John Paine. The disk contains some utilities such as disk managers, one that will handle up to 6 drives, a diagnostic routine and a terminal emulator. Good value and well worth getting hold of.

MODULES2 - also from John, this disk contains some educational programs well suited for early school age children. Also great value so make sure you get a copy.

SAXSAAN - a demonstration disk of a well written text adventure. This disk was recently "fixed-up" by George Meldrum. It is not the complete adventure but I figure it should be of interest to all keen adventurers.

GERMAN VOCABULARY - want to learn to speak and/or understand German. If you do then this disk is for you. Written by member Klaus Umland, it contains a dictionary of about 1000 words with English/German translations. Well done Klaus and thanks for this quality program. Also on this disk will be a nice piece of classical music, TRISTAN AND ISOLDA, programmed by Ken Gilliland, with the music from Richard Wagner, plus DISK INFORMATION MANAGER, written by Don Cook. Disk Information Manager has Look and Catalog options and runs out of Option 5 of E/A. A document file is included.

All the above disks will require 32K expansion.

#### ON TAPE:

TAPE 1987/8 will contain the following games all requiring 32K expansion:

AGRESSOR - a very fast paced space game of arcade quality.

DRAGONS - a game of skill where you navigate your flying dragon avoiding objects launched from the ground.

I'M LOST - a complex and addictive maze escape game which is guaranteed to have you tearing your hair out.

LINES - the demonstration program from the mini-memory module which produces colorful and intricate screen patterns.

PADDLE - a sort of ping-pong game which is good fun to play.

TOAD - a good hopping and jumping game which no doubt everybody knows.

WORM ATTACK - a type of centipede game where you need to avoid the various monsters.

FREDDY - this one was on the bulletin board a couple of months back. If you didn't get a copy then here is your chance. This is an excellent game full of colorful graphics and objects, which becomes quite addictive as you play. Find you way out if you can!

A big thanks to George Meldrum for his efforts in converting these programs to XB.

TAPE 1987/8A will be of general interest containing the following programs:

BUILD-IT - in Extended Basic. Calculates materials required to build a garage and shed.

TRUSS - in Basic. Determines forces in terms of tension and compression.

MELODY WRITER - in Extended Basic. Written by local member John Scott. This is a well written music composer/experimenter. Thanks John.

MELODY WRITER INSTRUCTIONS - in Extended Basic. This complements the actual Melody Writer program.

ESCHER ART - in Extended Basic. Dozens of changing symmetrical screen patterns. Quite fascinating to watch.

GORDIAN KNOT - in Extended Basic. This one allows you to create quite complex screen mazes. Has an under and over option so you don't cross your path.

SUPER JACKPOT - in Basic. This is a complex yet addictive poker machine game.

JET ENGINE - in Basic with TE2 and speech option. A well done graphical representation of how a jet engine works. Good educational material.

Well that should be enough to keep everyone happy for another month. More next time.

Here's a query from Barrie Stevenson who writes to say he is having trouble getting the desired results from a program published in the September, 1986 TND. The program is Music Writer and Barrie says that notes different to those typed are returned. Barrie hasn't entirely discounted the fact that he may have made a typing error in entering the program, but he wonders, if this is not the case, whether any one else who is using the program has had similar results. Anyone who would like to let Barrie know can write to him care of me at the TISHUG address.

## TECHO TIME

... John Paine

A number of members have asked about fitting their SPEECH SYNTHESIZER into the console. The following information is provided for those who wish to implement this modification. I also wish to point out that this project has been described before in this magazine.

Firstly, remove the speech board out of it's plastic case and remove the metal shield around the board. Carefully remove the female connector from the printed circuit board. This is done by carefully prying up each contact as you apply heat with a low wattage soldering iron. Some form of solder removing aid such as solderwick or a solder sucker would be usefull.

The next step requires the console to be dismantled. Remove all the screws from the base plate and carefully remove base. Remove the two screws on the power board and carefully remove the main board power leads. Remove the three retaining screws from the motherboard and carefully lift it to enable you to remove the keyboard connector. DO NOT TRY TO REMOVE THE MOTHER BOARD UNTIL KEYBOARD IS DISCONNECTED.

Remove the three bolts that hold the metal shell in place and then remove the shell.

At this stage, you will need to have two lenghs of 8 conductor ribbon cable and another similar lengh of single wire prepared. The lengh of the cables is not critical, just as long as there is enough to fit the speech board inside the console without the cable causing any obstruction when the shell of the motherboard is replaced and board is stuck down on the shell. You will have to split the ends of the cables a couple of inches to solder to the speech board and motherboard.

Now refer to the diagram below for the pin designations on the speech board. The pins are labeled as if you were viewing from the side where you removed the female connector.

- 44 TOP OF CONNECTOR 2
- 43 BOTTOM OF CONNECTOR 1

The top row of pins are evenly numbered and the bottom row are all odd numbers.

The motherboard connections are a mirror image of the speech board. Looking at the expansion port directly the connections are:

- 2 TOP OF M-BOARD 44
- 1 BOTTOM OF M-BOARD 43

The connections between the mother board and speech board are:

Mother Board	Speech Board
2 (top)-----	2 (top)
12 "-----	12 "
34 "-----	34 "
36 "-----	36 "
38 "-----	38 "
40 "-----	40 "
42 "-----	42 "
44 "-----	44 "
1 (bot)-----	1 (bot)
3 "-----	3 "
5 "-----	5 "
19 "-----	19 "
35 "-----	35 "
37 "-----	37 "
39 "-----	39 "
43 "-----	43 "

Connect the single wire to pin 21 (bot) of both the speech board and the motherboard. This is the earth or ground lead and is a big pad that takes four connections.

21 (bot)----- 21 (bot)

The next stage is to carefully reassemble the metal shell and stick the speech board to it using double sided tape, making sure that there are no short circuits from speech board to the metal shell, and that the cables do not foul or get jammed between the shell and motherboard.

Reassemble the console making sure that the keyboard is reconnected and power board refitted and then give it a try. Everything should work as before when the speech synthesizer was plugged into the side of the console.

## FAULT of the MONTH

This month I wish to talk about a continual problem associated with the module port of the computer. Many articles have appeared in this digest about lockups caused by dirty contacts in the port and these lockups are usually associated with the Extended Basic module.

The usual procedures for cleaning the connectors have been described in detail before. This article will deal with another variation of the same problem.

Other major problems encountered with the module port relate to the edge connector of the port which plugs into the computer motherboard. As our machines age the contacts of the edge connector are subject to a fair amount of lateral movement and after a period of time the actual solder plating of the connector is worn away. The exposed copper has a tendency to oxidise fairly quickly and the integrity of the connection becomes compromised. To digress slightly, the same can be said for all your favorite modules as well, and the same technique for patching up the solder plating on modules applies.

I have also found that both module and port connectors suffer from oxidisation of the solder plating which gives the same end result as the original lockup problems we all have had with Extended Basic at some time or another.

The fix to all these problems is to use a low to medium power soldering iron, suitably tinned, to reform the original solder plating over the now exposed copper. Do not tin the iron with a lot of solder, but rely on the heat of the iron to melt the existing old solder. Run the hot iron down the lengh of the connector in the direction from module or module port to the edge. Use a rag or sponge to wipe the black residue formed away from the connector and marvel at the seemingly newly plated connector. Do NOT use any new solder if possible and make sure that when wiping the connector with the hot iron that you do not leave any lumps or bumps in the solder plating.

After this exercise, clean the motherboard connector, and the module connector with a FREON based cleaning agent and a clean rag by using a small screwdriver or knife blade. If your rag is covered in a nasty black residue, you then know that the chances of curing your lockup problems has been elevated to about a 99% probability.

Before reconnecting the module port, check to see if the original felt pad installed by TI is still in place. If so, carefully remove and throw away as far as possible. Repeat the cleaning process and re-install.

Please note that the club shop still has a number of reconditioned module port connectors in stock for the modest sum of \$12.00 so I would suggest that it would be a worthwhile investment to obtain a spare in case the actual tracking of the connector is damaged beyond repair.

Last month I wrote an article on the relative merits and demerits of cleaning disk drives.

A number of people have taken me to task on this subject, therefore in my own defence I wish to pass on the following article prepared by someone else, and let you be the judge.

## DISK DRIVE CLEANING

How often should diskette drives be cleaned? A survey of manufactures, computer dealers and service technicians yielded conflicting suggestions.

The advice seems to fall into the two camps. The people who build and install the disk drives said cleaning is rarely necessary, and some of them emphatically warned that the drives can be seriously damaged by the inexpensive cleaning kits sold in most stores.

On the other hand, some of the people who sell the computers and disk drive cleaning kits recoiled at the thought of letting even a week go by without swabbing the decks.

Although fancy cleaning kits can cost as much as \$50, the most popular versions cost about \$10 and consist of a slightly abrasive floppy disk cleaning pad and perhaps a vial of alcohol.

Why would one need a disk drive cleaner in the first place? Floppy disks inevitably introduce tiny bits of grit into the drive unit, either through hitchhiking dust particles or as loose flecks of the magnetic material that holds data on the diskette. If debris builds up significantly, it can harm or even ruin other diskettes.

### HOW MUCH TIME?

But how long does it take for a significant risk to develop? According to a representative in the service department of one of the largest retail computer franchises in Manhattan, users should clean their drives "at least" once a week. This was echoed at several other retail computer dealerships.

Such advice makes computer manufacturers howl, "fatal error."

"Perhaps once every six months," a technical advisor at Kaypro allowed, "but you wouldn't want to clean it much more than that. Some kit disk cleaners on the market are mildly corrosive and if used frequently might harm the disks."

A spokesman at Apple said the company does not recommend the cleaning kits at all. "Users who try the store-bought cleaners could end up messing up the drives more than fixing them," he said. "If there's a problem, take the drive to an authorized dealer."

Even Verbatim of Sunnyvale, Calif., which makes Datalife, one of the most popular kits, says cleaning the drives daily is silly unless "hundreds or thousands" of diskettes are run in and out regularly. For the average home or office user, a Verbatim technician said, once every month or two would suffice. He denied that his company's kit would harm disk drives unless it was used improperly. Verbatim engineers ran a cleaning disk nonstop for two days - the average use is a few seconds - and there was no measurable wear, he said.

Obviously there is a disagreement, but the weight of the evidence certainly goes against frequent cleaning, say, more than once every few months. If the drive has been functioning well, it probably requires the services of a qualified repair technician.

## Using A RAMDISK In A Single Floppy Drive System

With the advent of RAMDISKs there will probably be a large number of users who will want to use one in a system which has only one floppy disk drive. Whilst it is true that a RAMDISK makes a very nice second drive, there are times when a second floppy drive (as well as the RAMDISK) might also seem desirable.

For example, picture the situation where you wish to use TI-WRITER out of the RAMDISK, so you use DM1000 to copy EDITA1 and EDITA2 onto the RAMDISK. From BASIC you then change the RAMDISK to respond to Drive 1 (CALL DN(1)) and proceed to run and use TI-WRITER saving your files onto the RAMDISK. So far so good, but what do you do now if you want to access another DV/80 file that is on a floppy disk? Remember that the RAMDISK is currently responding to Drive 1. The only solution might seem to be to quit TI-WRITER, CALL DN(2) from BASIC, reload DM1000, copy the required file from the floppy disk to the RAMDISK, quit back to BASIC, CALL DN(1), reselect TI-WRITER, and then load in the required file. Quiet a tedious operation.

Fortunately there appears to be a better solution :-

By installing a DPDT toggle switch, one can easily make the floppy respond to either Drive 1 OR Drive 2. So, when using the RAMDISK as Drive 1, the switch can be set on the floppy so that it responds to Drive 2, and vice versa.

A subminiature toggle switch can be mounted on the front panel of the floppy and wired directly to the Drive Select socket. Simply wire the switch so that the floppy drive can be toggled between either Drive 1 or Drive 2 and label the switch accordingly.

Be careful in carrying out any hardware modifications. If you are unsure, please contact your regional group technical co-ordinator before proceeding.



Return to Pirate's Isle

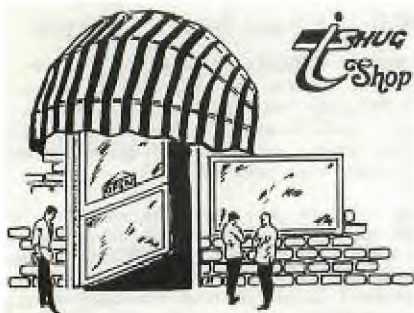
Ever since this module was released there have been many requests for assistance in helping to solve the adventure. Over the next few months(years?) this column will give you a complete solution. Is this pirating?

### Chapter 1

Get up, open port, go port, get oils, go sea, go boat, go down, wear glass, move bed, go top, get mask, get watch, go down, go down, go engine, look engine, go down, go up, look ceiling, press butt, wait, wait, wait, look port, press butt, look fan, unscrew blade.

That's enough for this month. Isle pirate more for you to return.





TISHUG SHOP AUGUST 1987

**RAM DISK CARD STATUS REPORT:-**

The second run of RAM CARD PCBs (59 boards) has now been delivered; with these 59 cards and the 64 previously delivered this makes 123 cards total that we have received.

As of the time of writing this article we have received orders for :-

- 49 Ram card PCBs
- 18 Auxiliary component kits
- 12 Sets of sockets
- 566 6264L-15 RAM chips
- 4 256K Ram expansion kits

All the above items ordered will be available at the shop for the August meeting. Please bring your Receipt or Money along to the meeting.

Due to Mr. Keating increasing the sales tax on all electronic components from 20% to 30% this will mean that our price will have to rise for any future orders, the only item to change so far is the set of sockets.

**The prices are:-**

- RAM CARDS.....\$ 35.00
- AUX.COMPONENTS.....\$ 20.00
- SOCKETS.....\$ 6.00
- 6264L-15 RAM CHIPS (13)...\$ 71.50 (SINGLE SIDE)
- " " " (24)...\$132.00 (DOUBLE SIDE)
- 256K Ram expansion kit \$ 47.00

Robert Peverill will have a limited stock of AAA batteries in stick form at the August meeting...\$14.50

PRINTER BUFFER (see March Aust. Electronics monthly.)  
The "Don McKenzie" 256K Centronics Printer Buffer kit in either PIO or SERIAL form, has been selling fairly well with 14 kits sold to date.

**The prices are approximately:-**

- PIO PCB and board components.....\$110.00
- Serial board and components.....\$ 49.00
- Computer sharer board and components.\$ 20.00
- Printer sharer board and components..\$ 20.00

NOTE: No plugs, leads, switches, heat sink or box is included in the above prices.

**SHOP INVENTORY.**

- (a) HF1 DS/DD 5 1/4" Disks.....per box \$19.00
- (b) Spike Protectors.....\$29.00
- (c) Consoles Ver.2-2.....\$65.00
- (d) 32k Matchbox Memory Expansion  
(sold out for the time being)
- (e) T.I. Joystick handles.....\$00.50
- (f) Peter Schubert's mini-expansion unit  
DS/DD Disk controller card.....\$190.00  
RS232 board.....\$ 80.00  
32k memory exp. for mini PE box...\$ 45.00  
DS/DD controller plus RS232  
complete in box.....\$290.00  
Finished painted box for Mini PE...\$ 30.00
- (g) Stand alone RS232.....\$ 80.00

**SECOND HAND ITEMS :-**

- (a) Keyboards.....\$15.00
- (b) Grom Ports.....\$12.00
- (c) Ivory Console Cases.....\$ 2.00

**BOOKS :-**

- (a) Back issues of SND.....\$ 1.00
- (b) Technical manual.....\$15.00
- (c) TI-writer manual.....\$15.00
- (d) Editor Assembler manual.....\$28.00
- (e) Micropendiums.....\$ 2.90  
1986-June to Dec./1987-Jan.to June

**SOFTWARE :-**

- (a) Club Software Tapes.....\$ 3.00
- (b) Club Software Disks.....\$ 5.00
- (c) Picasso Publisher V1.1 (Arto Heino).\$20.00

**POSTAGE**

Please NOTE that with all mail orders YOU have to pay postage and packaging.  
See JUNE ISSUE of SND for approx rates.

If you are phoning the SHOP please note that I am NOT normally available before 7pm week days. (02)639 5847



LIVERPOOL REGIONAL GROUP

I would like to thanks HANS ZECEVIC for the constant supply of cuppas and yummies. The meeting was a unique opportunity for our members to see an AUSTRALIAN HI-TECH LASER PRINTER in action.

We started the meeting by printing out the assembly tutuorial on the LASER printer, and WOW!! fantastic speed and text capabilities. Some graphic files were printed as well, solid blacks and square dots..  
BRILLIANT

Artos tutorial was centered around the different RAM MEMORY concepts used in our 4A. -CPU -VDP -GRAM

MARCEL ZIAI demonstrated his special MULTI-LOADER program which can be used instead of a unique LOADER for each disk. His program can also view D/V 80 files and is menu driven. A young man with ZEST to program our 4A, there must be more members with the same ZEAL!!

SHANE FERRET showed a new RAM DISK utility that will BLOW your mind. DM 1000 on powerup??

JOHN PAINE gave a talk about a new device called 'CD-ROM'. Lets look at its merits:

660 MEGABYTES OF Read Only Memory  
LASER SPEED Access Time  
SAME AS CD Music Player  
VIDEO,SOUND & DATA on the same disk  
adaptable to our 4A.

Every 4A program ever written can easily fit on ONE disk with room to put a WHOLE dictionary & AUSTRALIAN road map with all suburban roads as well.

RING ARTO HEINO - (02) 603 8956 for details of the next meeting.

DATE HELD- 7/8/87 - 7.30 pm









# TISHUG NEWS DIGEST

```

1750 CALL HCHAR(23,X,ASC(SEG
$(E$,X,1)))
1760 NEXT X
1770 FOR X=1 TO 2000
1780 NEXT X
1790 FOR C=1 TO 12
1800 CALL VCHAR(17,C,32,8)
1810 NEXT C
1820 FOR C=13 TO 32
1830 CALL VCHAR(2,C,32,23)
1840 NEXT C
1850 RETURN
1860 REM GAME STARTS
1870 READ B$,C$,D$,E$,F$
1880 FOR X=1 TO LEN(B$)
1890 CALL HCHAR(2,18+X,128)
1900 CALL SOUND(50,440,2)
1910 CALL HCHAR(3,18+X,ASC(S
EG$(B$,X,1)))
1920 CALL HCHAR(4,18+X,128)
1930 CALL SOUND(50,110,2)
1940 NEXT X
1950 FOR X=1 TO LEN(J$)
1960 CALL HCHAR(1,X+1,ASC(SE
G$(J$,X,1)))
1970 CALL SOUND(-5,660,8)
1980 NEXT X
1990 FOR X=1 TO LEN(C$)
2000 CALL HCHAR(7,X+14,ASC(S
EG$(C$,X,1)))
2010 CALL SOUND(-5,770,8)
2020 NEXT X
2030 FOR X=1 TO LEN(D$)
2040 CALL HCHAR(17,X,ASC(SEG
$(D$,X,1)))
2050 CALL SOUND(-5,880,8)
2060 NEXT X
2070 FOR X=1 TO LEN(E$)
2080 CALL HCHAR(22,X,ASC(SEG
$(E$,X,1)))
2090 NEXT X
2100 FOR X=1 TO LEN(F$)
2110 CALL HCHAR(23,X,ASC(SEG
$(F$,X,1)))
2120 NEXT X
2130 HCHAR(9,18,137,W)
2140 N
2150 REM KEYBOARD CONTROLS
2160 FOR X=1 TO 250
2170 NEXT X
2180 CALL KEY(0,K,ST)
2190 CALL HCHAR(19,4,32)
2200 CALL HCHAR(19,4,142)
2210 IF ST=0 THEN 2180
2220 O=K
2230 CALL HCHAR(19,4,K)
2240 FOR X=1 TO 50
2250 NEXT X
2260 ST=0
2270 CALL KEY(0,K,ST)
2280 IF ST=0 THEN 2270
2290 IF K=7 THEN 2770
2300 IF K>13 THEN 2270
2310 E=0
2320 FOR X=1 TO LEN(W$)
2330 K=ASC(SEG$(W$,X,1))
2340 IF O=K THEN 2690
2350 NEXT X
2360 IF E<>0 THEN 2150
2370 CALL HCHAR(14,1,32,32)
2380 CALL HCHAR(19,4,32)
2390 Q=Q+1
2400 IF Q=2 THEN 2480
2410 IF Q=3 THEN 2510
2420 IF Q=4 THEN 2550
2430 IF Q=5 THEN 2590
2440 IF Q=6 THEN 2620
2450 CALL HCHAR(4,8,136)
2460 RESTORE 800
2470 GOTO 2640
2480 CALL VCHAR(5,8,137,2)
2490 RESTORE 810
2500 GOTO 2640
2510 CALL HCHAR(5,7,138)
2520 CALL HCHAR(5,6,139)
2530 RESTORE 820
2540 GOTO 2640
2550 CALL HCHAR(5,9,140)
2560 CALL HCHAR(5,10,141)
2570 RESTORE 830
2580 GOTO 2640
2590 CALL VCHAR(7,8,142,2)
2600 RESTORE 840
2610 GOTO 2640
2620 CALL VCHAR(7,8,143,2)
2630 RESTORE 850
2640 READ C$
2650 FOR X=1 TO LEN(C$)
2660 CALL HCHAR(14,X,ASC(SEG
$(C$,X,1)))
2670 NEXT X
2680 IF Q=6 THEN 2810 ELSE 2
150
2690 CALL HCHAR(9,X+17,0)
2700 E=1
2710 FOR C=1 TO W
2720 CALL GCHAR(9,C+17,MC)
2730 IF MC=137 THEN 2350
2740 NEXT C
2750 Q=Q+1
2760 GOTO 3140
2770 CALL HCHAR(19,4,32)
2780 FOR X=1 TO 200
2790 NEXT X
2800 GOTO 2150
2810 FOR C=1 TO 32
2820 CALL VCHAR(17,C,32,8)
2830 NEXT C
2840 READ C$
2850 FOR X=1 TO LEN(C$)
2860 CALL HCHAR(18,X,ASC(SEG
$(C$,X,1)))
2870 NEXT X
2880 FOR X=1 TO W
2890 CALL HCHAR(18,X+LEN(C$)
+2,ASC(SEG$(W$,X,1)))
2900 NEXT X
2910 READ P$,D$,E$
2920 GOTO 3610
2930 FOR C=1 TO 32
2940 CALL VCHAR(14,C,32,11)
2950 NEXT C
2960 FOR X=1 TO LEN(E$)
2970 CALL HCHAR(19,10+X,ASC(
SEG$(E$,X,1)))
2980 NEXT X
2990 RETURN
3000 READ C$
3010 FOR X=1 TO LEN(C$)
3020 CALL HCHAR(21,X,ASC(SEG
$(C$,X,1)))
3030 NEXT X
3040 FOR X=1 TO 800
3050 NEXT X
3060 FOR C=1 TO 32
3070 CALL VCHAR(17,C,32,8)
3080 NEXT C
3090 IF Q=6 THEN 2620
3100 RESTORE 780
3110 READ B$,C$,D$,E$,F$,G$
3120 GOSUB 2030
3130 GOTO 2400
3140 FOR C=1 TO 32
3150 CALL VCHAR(14,C,32,11)
3160 NEXT C
3170 IF Q=6 THEN 3320
3180 IF Q=5 THEN 3300
3190 IF Q=4 THEN 3280
3200 IF Q=3 THEN 3260
3210 IF Q=2 THEN 3240
3220 RESTORE 890
3230 GOTO 3330
3240 RESTORE 900
3250 GOTO 3330
3260 RESTORE 910
3270 GOTO 3330
3280 RESTORE 920
3290 GOTO 3330
3300 RESTORE 930
3310 GOTO 3330
3320 RESTORE 940
3330 READ C$
3340 FOR X=1 TO LEN(C$)
3350 CALL HCHAR(19,X,ASC(SEG
$(C$,X,1)))
3360 NEXT X
3370 RESTORE 870
3380 GOTO 2910
3390 CALL CLEAR
3400 PRINT "THIS PROGRAM USE
S 50 WORDS FOUND IN THE DAT
A LINES. THESE LINE NUMBE
RS ARE:"
3410 PRINT " LINE 810
LINE 820
LINE 830
LINE 840"
3420 PRINT "IF YOU WISH TO C
HANGE THE SET OF WORDS, TH
EN YOU MAY DO SO BY ALTERIN
G THE DATA"
3430 PRINT "IN THE ABOVE LIN
ES. BUT THE NUMBERS
OF WORDS MUST BE EXACTLY
50 WORDS."
3440 PRINT "I HOPE YOU WILL
ENJOY THIS GUESSING PROGRAM
. BYE"
3450 PRINT : : "
colin"
3460 PRINT : "PRESS ANY KEY T
O EXIT"
3470 CALL KEY(0,CH,ST)
3480 IF ST=0 THEN 3470
3490 END
3500 CALL HCHAR(20,N,142)
3510 RETURN
3520 PRINT "THIS IS THE HANG
MAN PROGRAM.YOU ARE REQUIRED
TO GUESS A WORD (MAX. 5 MIS
TAKES)"
3530 PRINT : : "GUESS ONE LET
TER AT A TIME--"
3540 PRINT : : "TO CORRECT TY
PING MISTAKES--PRESS (FCTN)E
RAISE AND THEN TYPE THE LETT
ER YOU WANT."
3550 PRINT : : "PRESS ENTER A
FTER THE LETTER"
3560 PRINT : : : : "PRESS A
NY KEY TO BEGIN"
3570 CALL KEY(0,CH,ST)
3580 IF ST=0 THEN 3570
3590 CALL VCHAR(1,3,32,672)
3600 RETURN
3610 REM (* MUSIC *)
3620 H1=2^(1/12)
3630 H(0)=30000
3640 H(1)=262
3650 FOR I=2 TO 25
3660 H(I)=H(I-1)*H1
3670 NEXT I
3680 T=200
3690 PS$="RC1D1EF1G1A1BZ.#84
+2-111"
3700 FOR I=1 TO LEN(PS$)
3710 PS(ASC(SEG$(PS$,I,1)))=
I
3720 NEXT I
3730 RESTORE 950
3740 READ S$
3750 O1=0
3760 D1=2
3770 K=0
3780 FOR I=1 TO LEN(S$)

```

```

3790 C$=SEG$(S$,1,1)
3800 X=PS(ASC(C$))
3810 IF X>13 THEN 3870
3820 IF X=0 THEN 3980
3830 K=K+1
3840 S(K)=X-1-0.1*(X>1)
3850 D(K)=D1
3860 GOTO 3980
3870 ON X-13 GOTO 3880,3910,
3880,3940,3940,3970,3940,397
0,3980,3980,3940
3880 IF S(K)=0 THEN 3980
3890 S(K)=S(K)+X-15
3900 GOTO 3980
3910 D1=D1*1.5
3920 D(K)=D1
3930 GOTO 3980
3940 D1=X-16
3950 D(K)=D1
3960 GOTO 3980
3970 O1=-12*(X+19)
3980 NEXT I
3990 K=K+1
4000 D(K)=2
4010 S(K)=0
4020 FOR X=1 TO LEN(P$)
4030 CALL HCHAR(22,X,ASC(SEG
$(P$,X,1)))
4040 NEXT X
4050 FOR X=1 TO LEN(D$)
4060 CALL HCHAR(24,X,ASC(SEG
$(D$,X,1)))
4070 NEXT X
4080 FOR I=1 TO K
4090 CALL KEY(0,CH,ST)
4100 IF ST THEN 4130
4110 CALL SOUND(T*D(I),H(S(I
)),1)
4120 NEXT I
4130 IF CH=49 THEN 100
4140 IF CH=51 THEN 3390
4150 IF CH>>50 THEN 4080
4160 GOTO 2930
4170 END

```



```

90 CALL CLEAR :: FOR S=0 TO
12 :: CALL COLOR(S,2,8):: NE
XT S :: CALL SCREEN(5)
100 DISPLAY AT(2,10):"TIGERC
UB": " HYPHENATED FILL AND
ADJUST"
110 DISPLAY AT(6,1):" Prepar
e text with TI-Writer": "Edit
or. Leave left TAB at 0,": "s
et right TAB at the actual"
:"value of the line length d
e-"
115 DISPLAY AT(10,1):"sired
(i.e., for a 28-char": "lin
e, set it at 28)."
120 DISPLAY AT(12,1):" Inden
t as desired. Center": "hea
dings as desired but be": "
sure to follow them with a
": "line feed (Enter). Hyphen
ate"
130 DISPLAY AT(16,1):"as de
sired and follow the": "hyp
hen immediately with a": "
line feed (Enter)."
140 ON ERROR 150 :: GOTO 160
150 ON ERROR 150 :: RETURN 1
60

```

```

160 DISPLAY AT(20,1):"INPUT
FILE? DSK" :: ACCEPT AT(20,1
6)BEEP:F$ :: OPEN #1:"DSK"&F
$,INPUT
170 DISPLAY AT(22,1):"OUTPUT
FILE? DSK" :: ACCEPT AT(22,
17)BEEP:N$ :: OPEN #2:"DSK"
&N$,OUTPUT
180 DISPLAY AT(24,1):"LINE L
ENGTH?" :: ACCEPT AT(24,14)V
ALIDATE(DIGIT):L
190 LF$=CHR$(13):: H$="-"&CH
R$(13)
200 ON ERROR 200 :: GOTO 210
210 ON ERROR 200 :: RETURN 3
00
220 LINPUT #1:M$ :: IF M$="
" OR M$=LF$ OR M$=" " OR ASC(
M$)>127 OR(LEN(M$)=L AND POS
(M$,LF$,1)=0)OR POS(M$, " ",1
)=0 THEN 300
230 IF POS(M$,LF$,1)<>0 AND
POS(M$,H$,1)=0 THEN 300
240 IF POS(M$,H$,1)<>0 THEN
M$=SEG$(M$,1,LEN(M$)-1)
250 IF LEN(M$)=L THEN 300
260 P=1
270 X=POS(M$, " ",P):: IF X=P
THEN P=P+1 :: GOTO 270 ELSE
Y,P=X :: IF POS(M$, " ",P)=O
OR P=L THEN 300
280 M$=SEG$(M$,1,X)&" "&SEG$(
M$,X+1,255):: IF LEN(M$)>=L
THEN 300 ELSE P=X+2
290 X=POS(M$, " ",P):: IF X=O
THEN P=Y :: GOTO 290 ELSE G
OTO 280
300 IF LEN(M$)<=L THEN 310 :
: CALL SOUND(200,110,0,-4,0)
:: PRINT M$;" is";LEN(M$);"c
haracters long": "Truncated t
o ";SEG$(M$,1,L):"OK" (Y/N)"
305 CALL KEY(3,K,S):: IF S=O
THEN 305 ELSE IF K>89 THEN
STOP ELSE M$=SEG$(M$,1,L)
310 PRINT #2:M$ :: IF EOF(1)
<>1 THEN 220 ELSE CLOSE #1 :
: CLOSE #2

```



```

90 CALL CLEAR :: FOR S=0 TO
12 :: CALL COLOR(S,2,8):: NE
XT S :: CALL SCREEN(5)
100 DISPLAY AT(1,4)ERASE ALL
:"28-COLUMN CONVERTER" :: DI
SPLAY AT(3,12):"by Jim Peter
son" !modified to underline
ASCII's above 126
110 DISPLAY AT(5,1):" To con
vert a program, saved": "with
LIST ""DSK1.FILENAME""": "i
nto 28-column format which":
"can be merged into the text
"
120 DISPLAY AT(9,1):"buffer
of TI-Writer."
130 DISPLAY AT(11,1):" Optio
nally with transliter-": "ate
d @, &, *, ^ and . for": "pri
nting from formatter": "mode.
"

```

```

140 DISPLAY AT(16,1):" Progr
am should be RES in": "steps
of 10 starting at 100": "befo
re LISTING to disk."
150 DISPLAY AT(20,1):" Do yo
u want to print the": "file f
rom the": " (E)ditor?": " (F)o
r matter?"
160 ACCEPT AT(24,1)VALIDATE(
"EF")BEEP:Q$
170 LN=100 :: CALL CLEAR ::
INPUT "What is the FILENAME?
DSK":FN$ :: FN$="DSK"
&FN$ :: PRINT : :
180 INPUT "what is the new F
ILENAME? DSK":PN$ :: PN$="
DSK"&PN$ :: OPEN #1:FN$,DISP
LAY ,VARIABLE 80,INPUT :: OP
EN #2:PN$,DISPLAY ,VARIABLE
80,OUTPUT
190 IF Q$="E" THEN 195 :: PR
INT #2:".TL 126;94;": :: PRIN
T #2:".TL 123;64;": :: PRINT
#2:".TL 125;38;": :: PRINT #2
:".TL 124;42;": :: PRINT #2:
".TL 92;46;": :: PRINT #2:".NF
"
195 PRINT "Does the program
contain": "characters keyed i
n with": "CTRL or FCIN?(Y/N)"
196 ACCEPT AT(24,1)VALIDATE(
"YN"):QQ$
200 IF EOF(1)=1 THEN 300 ::
LINPUT #1:A$
210 IF LEN(A$)<80 THEN LN=LN
+10 :: GOTO 260
215 IF EOF(1)=1 THEN 260
220 LINPUT #1:B$ :: IF POS(B
$,STR$(LN),1)=1 THEN FLAG=1
:: LN=LN+10 :: GOTO 260
230 A$=A&B$ :: IF LEN(A$)<1
60 THEN LN=LN+10 :: GOTO 260
240 LINPUT #1:B$ :: IF POS(B
$,STR$(LN),1)=1 THEN FLAG=1
:: LN=LN+10 :: GOTO 260
250 A$=A&B$ :: LN=LN+10
260 S=1
270 L$=SEG$(A$,S,28):: IF Q$
="E" THEN 280 :: GOSUB 320
280 IF L$<>" " THEN 282 :: IF
FLAG=1 THEN FLAG=0 :: A$=B$
:: GOTO 210 :: ELSE GOTO 20
0
282 IF QQ$="N" THEN 290
283 FOR J=1 TO LEN(L$)
284 A=ASC(SEG$(L$,J,1)): IF
A<127 THEN L2$=L2$&CHR$(A):
: GOTO 288
285 IF A=127 THEN A=118 ELSE
IF A=128 THEN A=44 ELSE IF
A=155 THEN A=46 ELSE IF A=15
6 THEN A=59 ELSE IF A=157 TH
EN A=61 ELSE IF A=158 THEN A
=56 ELSE IF A=159 THEN A=57
ELSE A=A-64
286 L2$=L2$&CHR$(27)&CHR$(45
)&CHR$(1)&CHR$(A)&CHR$(27)&C
HR$(45)&CHR$(0)
288 NEXT J :: L$=L2$ :: L2$=
""
290 PRINT #2:L$ :: S=S+28 ::
GOTO 270
300 IF Q$="E" THEN 310 :: PR
INT #2:".FI;AD;"
310 CLOSE #1 :: CLOSE #2 ::
END
320 DATA @, ^, &, *, ^, $, *, ^, ., ±
330 RESTORE 320 :: FOR W=1 T
O 5 :: READ CH$,R$
340 X=POS(L$,CH$,1):: IF X=O
THEN 360
350 L$=SEG$(L$,1,X-1)&R$&SEG
$(L$,X+1,LEN(L$)): GOTO 340
360 NEXT W :: RETURN

```



```

100 DIM M$(400),F$(50)
110 GOTO 150
120 K,ST,SET,S,P$,P,CL,DW$,S
S$,I$,D$,E$,NC,CW,TC,TA,TX,A
V,CS,S$,LT,A$,LSP,LP,RM,OK$,
QQ$,X,F$( ),SL,F,IP,M$( ),T$,F
LAG,J,PP,LT$
130 CALL CLEAR :: CALL KEY :
: CALL COLOR :: CALL SCREEN
:: CALL SOUND
140 !@P-
150 CALL CLEAR :: CALL KEY(3
,K,ST):: ON WARNING NEXT
160 FOR SET=0 TO 14 :: CALL
COLOR(SET,2,8):: NEXT SET ::
CALL SCREEN(5)
170 DISPLAY AT(3,6):"TIGERCUB
PRINTALL": :TAB(7);"Copyri
ght 1987":TAB(6);"Tiger Cub S
oftware" !programmed by Jim
Peterson
180 DISPLAY AT(12,1):"May be
distributed without":"restr
iction providing that":"no p
rice or copying fee is":"cha
rged."
190 DISPLAY AT(18,7):"TURN P
RINTER ON!"
200 DISPLAY AT(20,8):"PRESS
ANY KEY" :: DISPLAY AT(20,8)
:"press any key" :: CALL KEY
(O,K,S):: IF S=0 THEN 200 EL
SE CALL CLEAR
210 DISPLAY AT(12,1):"PRINTE
R DESIGNATION?" :: ACCEPT AT
(14,1)BEEP:P$ :: IF POS(P$,
.LF",1)=0 THEN P$=P$&"LF"
220 ON ERROR 230 :: OPEN #1:
P$,VARIABLE 255 :: ON ERROR
STOP :: PRINT #1:CHR$(27);"@
" :: CALL CLEAR :: GOTO 240
230 DISPLAY AT(20,1):"CANNOT
OPEN PRINTER!" :: RETURN 21
0
240 DISPLAY AT(12,1):"PRINT
SIZE?": " (1) PICA": " (2)
ELITE": " (3) CONDENSED"
250 ACCEPT AT(12,13)VALIDATE
("123")SIZE(1):P :: PRINT #1
:CHR$(27);"B";CHR$(P);
260 !The values 80, 96 and 1
36 in the next line are the
maximum number of pica, elit
e and condensed characters p
er line on Gemini 10X
270 !Change as necessary for
your printer!
280 CL=(P=1)*80+(P=2)*96+(P=
3)*136 :: CL=ABS(CL)
290 DISPLAY AT(12,1)ERASE AL
L:"DOUBLE-WIDTH? (Y/N) N" ::
ACCEPT AT(12,21)SIZE(-1)VAL
IDATE("YN")BEEP:DW$ :: IF DW
$="Y" THEN PRINT #1:CHR$(27)
;"W";CHR$(1);: CL=CL/2
300 DISPLAY AT(12,1)ERASE AL
L:"SUPERSCRIP? (Y/N) N" ::
ACCEPT AT(12,20)SIZE(-1)VALI
DATE("YN")BEEP:SS$ :: IF SS$
="Y" THEN PRINT #1:CHR$(27);
"S";CHR$(0);
310 DISPLAY AT(12,1)ERASE AL
L:"ITALICS? (Y/N) N" :: ACCE
PT AT(12,16)VALIDATE("YN")SI
ZE(-1)BEEP:I$ :: IF I$="Y" T
HEN PRINT #1:CHR$(27);"4";
320 DISPLAY AT(12,1)ERASE AL
L:"DOUBLE-STRIKE? (Y/N) Y" :
: ACCEPT AT(12,22)VALIDATE("
YN")SIZE(-1)BEEP:D$ :: IF D$
="Y" THEN PRINT #1:CHR$(27);
"G";
330 IF P<3 AND P<4 THEN DI
SPLAY AT(2,1):"EMPHASIZED?

```

```

(Y/N) Y" :: ACCEPT AT(12,19)
VALIDATE("YN")SIZE(-1)BEEP:E
$ :: IF E$="Y" THEN PRINT #1
:CHR$(27);"E";
340 DISPLAY AT(12,1)ERASE AL
L:"NUMBER OF COLUMNS? (1-5)"
:: ACCEPT AT(12,26)VALIDATE
("12345")SIZE(1)BEEP:NC
350 DISPLAY AT(12,1):"COLUMN
WIDTH (NUMBER OF": "CHARAC
TERS?" :: ACCEPT AT(14,13)VA
LIDATE(DIGIT)BEEP:CW
360 TC=NC*CW :: TA=CL-TC ::
TX=TC+NC*2-2
370 IF TX<=CL THEN 390 :: DI
SPLAY AT(18,1):STR$(NC)&" co
lumn of "&STR$(CW)&" charac
ters": "plus 2-column spacing
equals"
380 DISPLAY AT(20,1):STR$(TC
)&" characters; maximum":"av
ailable in print size":"sele
cted is "&STR$(CL)&":"*****
Please reselect*****" :: GOTO
240
390 AV=INT(TA/(NC-1)):: DISP
LAY AT(12,1)ERASE ALL:"COLUM
N SEPARATION?":"MINIMUM 2":
"MAXIMUM "&STR$(AV)&" AVAILAB
LE ": "2"
400 ACCEPT AT(15,1)VALIDATE(
DIGIT)SIZE(-2)BEEP:CS :: IF
CS<2 OR CS>AV THEN 32767 ELS
E S$=RPT$( " ",CS)
410 TA=TA-CS*(NC-1):: IF TA<
2 THEN 450
420 DISPLAY AT(12,1)ERASE AL
L:"LEFT MARGIN WIDTH?": "MA
XIMUM "&STR$(TA)&" AVAILABLE
" :: ACCEPT AT(12,20)VALIDAT
E(DIGIT)BEEP:LT :: IF LT>TA
THEN 420
430 DISPLAY AT(12,1):"ALTERN
ATING LEFT/RIGHT": "MARGIN?
(for pages to be":"later re
produced on both":"sides) (Y
/N) N"
440 ACCEPT AT(16,14)VALIDATE
("YN")SIZE(-1):A$
450 LSP=12 :: DISPLAY AT(10,
1):" ": " ": "LINES PER PAGE?
60": " ": " ": " " :: ACCEP
T AT(12,17)VALIDATE(DIGIT)SI
ZE(-3):LP :: IF LP<70 THEN 4
90
460 DISPLAY AT(12,1):"LINE S
PACING - 72 INCH" :: AY
AT(11,16):" " :: AC AT
(10,16)VALIDATE(DIGIT)BEEP:L
SP
470 IF LP/(INT(72/LSP))>11.5
THEN DISPLAY AT(20,1):"WON'
T FIT!" :: GOTO 450
480 PRINT #1:CHR$(27);"A";CH
R$(LSP);
490 RM=TA-LT
500 DISPLAY AT(12,1)ERASE AL
L:STR$(NC)&" columns of":STR
$(CW)&"-character width": "le
ft margin of "&STR$(LT)&" sp
aces"
510 DISPLAY AT(15,1):STR$(LP
)&" lines per page": "with "&
STR$(LSP)&" /72 line spacing"
520 DISPLAY AT(17,1):STR$(CS
)&" spaces between columns":
"right margin of "&STR$(RM)&
" spaces": "OK? (Y/N) Y"
530 ACCEPT AT(20,11)VALIDATE
("YN")SIZE(-1)BEEP:OK$ :: IF
OK$="N" THEN 240
540 DISPLAY AT(12,1)ERASE AL
L:"PAUSE AT END OF PAGE? N"
:: ACCEPT AT(12,23)VALIDATE(
"YN")SIZE(-1):QQ$

```

```

550 DISPLAY AT(1,1)ERASE ALL
:"INPUT FILENAMES TO BE": "PR
INTED.": "PRESS ENTER WHEN DO
NE"
560 X=X+1 :: DISPLAY AT(X+3,
1):"FILENAME? DSK" :: ACCEPT
AT(X+3,14)SIZE(-12)BEEP:F$(
X)
570 IF F$(X)=" " THEN X=X-1
: GOTO 600 ELSE F$(X)="DSK"&
F$(X)
580 ON ERROR 590 :: OPEN #2:
F$(X):: CLOSE #2 :: GOTO 560
590 ON ERROR STOP :: CALL SO
UND(1000,110,0,-4,0) :: DISPL
AY AT(20,1):"CANNOT OPEN "&F
$(X):: X=X-1 :: RETURN 560
600 SL=1
610 F=F+1 :: IF F>X THEN 700
:: ON ERROR 620 :: OPEN #2:
F$(F),INPUT :: DISPLAY AT(22
,1):"READING "&F$(F):: ON ER
ROR STOP :: GOTO 630
620 CALL SOUND(1000,110,0,-4
,0) :: DISPLAY AT(20,1):"COUL
D NOT OPEN "&F$(F):: STOP
630 FOR IP=SL TO LP*NC :: LI
NPUT #2:M$(IP):: IF LEN(M$(I
P))=0 THEN 670 :: IF NC>1 AN
D POS(M$(IP),CHR$(13),1)<0 O
THEN M$(IP)=SEG$(M$(IP),1,LE
N(M$(IP))-1)
640 IF ASC(M$(IP))>126 OR AS
C(M$(IP))<32 THEN IP=IP-1 ::
GOTO 680
650 IF LEN(M$(IP))<=CW THEN
670 :: M$(IP)=SEG$(M$(IP),1,
CW):: CALL SOUND(1000,110,0,
-4,0) :: DISPLAY AT(12,1):M$(
IP);" OVER";CW;"CHARACTERS":
"TRUNCATED TO ";T$;"OK?"
660 CALL KEY(3,K,S):: IF S=0
THEN 660 ELSE IF K<>89 THEN
STOP
670 M$(IP)=M$(IP)&RPT$( " ",C
W-LEN(M$(IP)))
680 IF EOF(2)=1 THEN CLOSE #
2 :: SL=IP+1 :: GOTO 610
690 NEXT IP :: IF EOF(2)=1 T
HEN CLOSE #2 :: GOTO 720 ELS
E GOTO 720
700 ON ERROR 710 :: FLAG=1 :
: FOR J=IP+1 TO NC*LP :: M$(
J)=" " :: NEXT J :: GOTO 720
710 STOP
720 PP=PP+1 :: IF PP/2=INT(P
P/2)AND A$="Y" THEN LT$=RPT$(
 " ",RM)ELSE LT$=RPT$( " ",LT
)
730 FOR J=1 TO LP :: ON NC G
OSUB 750,760,770,780,790 ::
NEXT J :: PRINT #1:CHR$(12):
: SL=1 :: IF F>X THEN STOP E
LSE IF QQ$="N" THEN 630
740 DISPLAY AT(24,1)BEEP:"PR
ESS ANY KEY TO CONTINUE" ::
CALL KEY(O,K,S):: IF S=0 THE
N 740 ELSE DISPLAY AT(24,1):
" " :: GOTO 630
750 PRINT #1:LT$&M$(J)&CHR$(
10):: RETURN
760 PRINT #1:LT$&M$(J)&S$&M$(
J+LP)&CHR$(10):: RETURN
770 PRINT #1:LT$&M$(J)&S$&M$(
J+LP)&S$&M$(J+LP*2)&CHR$(10
):: RETURN
780 PRINT #1:LT$&M$(J)&S$&M$(
J+LP)&S$&M$(J+LP*2)&S$&M$(J
+LP*3)&CHR$(10):: RETURN
790 PRINT #1:LT$&M$(J)&S$&M$(
J+LP)&S$&M$(J+LP*2)&S$&M$(J
+LP*3)&S$&M$(J+LP*4)&CHR$(10
):: RETURN

```

## EXTENDED BASIC TUTORIAL.

by Ross Mudie, TISHUG, 6th July 1987.

The committee of TISHUG has become aware of the fact that there are a number of members who need some tutorial material in extended basic. This tutorial contains a response to the request by Eric Whelan in the July 87 TND for an explanation of "IMAGE" & "PRINT USING", plus some answers to questions posed to me by members at the July TISHUG meeting.

### 1. HOW TO GET A PROGRAM TO LOAD & RUN AUTOMATICALLY.

This feature only works on a disk system.

TI Extended Basic when entered, (from the master screen press any key, then 2 for Extended basic), tests to see if a disk system is attached. If it is, then it searches the disk in drive 1 for a program named LOAD. If a program named LOAD is found then it is loaded into memory and the program is run.

Your program named LOAD may contain print statements to give you a menu of other programs on the disk or it may even access the disk catalog and build up a list of programs & files which are on the disk. If a menu selection is then provided you can load and run to other programs using RUN "DSK1.PROGNAME". At the end of other programs you can return to the LOAD program with RUN "DSK1.LOAD"

### 2. SAVING A PROGRAM ON DISK WITH THE CORRECT NAME.

Often when I am writing a program I forget the name that I wanted to save the program under, so here is the way I leave myself a reminder and save a bit of typing as well; this is a "quick and convenient" tip.

I always start my program lines at 100 and line 100 is always my "save" line, as follows:

```
100 ! SAVE DSK1.PROGNAME
```

To use this when I want to save the program that I am working on I type 100 <fctn> down to get line 100 into the edit mode; then press <enter>, then <fctn> 8 which is REDO. Then use <fctn> 1 to delete the 100 ! & press <enter>. The program will be saved to disk using the information previously contained in the REMARK in line 100 as a command.

### 3. PRINT USING and IMAGE.

PRINT employing USING or IMAGE is a very convenient way to format the output of columns of dollar amounts either to the screen or printer. The statements are very versatile as shall be seen from the following.

Type the following short program in under extended basic and run it. If you enter a number it will be justified around the decimal point position & a \$ sign will be printed. If the value that you enter has more than 2 decimal places the decimal part will be rounded to 2 decimal places. If there are no digits after the then 00 will follow the decimal point. If there are less than 4 digits before the decimal point then the then the unused places will be spaces, the decimal point will line up. If the input is greater than 4 digits before the decimal point then the output will be replaced by a row of stars, \* .

Try this little program now.

```
100 ! SAVE DSK1.IMAGE
110 IMAGE $####.##
120 INPUT A
130 PRINT USING 110:A
140 GOTO 120
```

When IMAGE is used the image string needs no quotes, (although they may be used). In the following examples which specify the image string in the PRINT USING statement the image must be enclosed in quotes, the IMAGE line is not required in the following examples.

```
100 ! SAVE DSK1.USING
120 INPUT A
130 PRINT USING "$###.##":A
140 GOTO 120
```

To use these statements with a program which outputs to your printer change the program as follows.

```
100 ! SAVE DSK1.USINGPIO
110 OPEN #1:"PIO"
120 INPUT A
130 PRINT #1,USING "$###.##":A
140 GOTO 120
```

The use of IMAGE is to allow one specification of the way the output is formatted then this way is referenced from lines throughout the program. The advantage of this is that in a complex program which is employing IMAGE, it is possible to change the handling of output format by changing just one line.

PRINT USING and PRINT USING IMAGE are a convenient way to line up columns of figures. The use of the \$ sign is also optional, any character or string could be used in this position or the \$ sign can be simply left out, e.g., \$US or \$A could be used.

Tabulating with PRINT USING must be set up as a pending print prior to the PRINT USING statement. By adding the following line to any of the above programs TAB may be used: 125 PRINT TAB(10);

PRINT USING can also be used with strings. In this case the reference point is left justified, rather than from the decimal point which was used in the numeric examples. For this type in a name of 8 characters or or less; greater than 8 characters gives \*\*\*\*\*. The maximum length of the field is the number of # characters in the IMAGE clause or the PRINT USING string. Try an input string with leading spaces, you will find that the leading spaces are ignored.

```
100 ! SAVE DSK1.USINGSTR
120 INPUT A$
125 PRINT TAB(10);
130 PRINT USING "HELLO ####":A$
140 GOTO 120
```

The following example shows the use of IMAGE with strings:

```
100 ! SAVE DSK1.IMAGESTR
110 IMAGE HELLO ####
120 INPUT A$
125 PRINT TAB(10);
130 PRINT USING 110:A$
140 GOTO 120
```

USING can also be used with DISPLAY and DISPLAY AT; the references are found in the Extended Basic manual as follows:

DISPLAY USING	page 79
IMAGE	pages 97-100
PRINT USING	page 150

### 4. PROGRAM FORMAT WHICH WILL NOT RUN IN EXTENDED BASIC

A number of people have experienced problems with programs which show up as PROGRAM format when cataloged using the disk manager but give an error if loaded into extended basic with OLD.

It is most likely that these programs are in fact for loading under option 5 of Editor/Assembler which is the RUN PROGRAM FILE option. These programs will probably also be loadable from BEAXs option 5.

The programs which load under e/a opt 5 are assembly in memory image format and the disk catalog does not differentiate between this format and a Basic or Extended basic program which is also stored in memory image format.



## The TI-99 Scene In The USA

By Ben Takach

It was a good opportunity to meet American TI-99 users during my recent trip to Canada and the USA. Although my schedule was quite tight, the weekends were by and large free.

I had no luck in Canada, as it turned out the few phone numbers given to me were no longer valid. Also Canada being a very large country one can only hope to locate TI Users if they happen to be in the vicinity of the town visited.

I had more luck in the USA, Columbus in Ohio state is my favourite spot and it also has a very active users group. Jim Peterson of Tiger Cub fame lives there. I had a few Columbus phone numbers given to me by our club officials - but these again turned out to be duds. I had Jim Peterson's address but no Peterson listed in the local phone book happened to have that address. So I visited him unannounced. Jim, contrary to my expectation, turned out to be well past retiring age and his computer room reminded me of John Paine's work room. In short we talked in his lounge room where there was more room and comfort. If you ever visited John you will know what I mean. Jim is a delightful person and a dedicated basic programmer who enjoys broadening his understanding of his favourite 99/4A. He is strictly a BASIC and XB programmer and has no intention of taking up assembly. Jim gave a very comprehensive overview of the USA 99/4A scene. As far as the users outlook and involvement, the interest and application of the computer goes it is comparable to the Australian Scene. The only difference is the easier access to the remaining hardware and peripherals. We agreed that the user groups will gradually get smaller and the remaining members will be more dedicated. You have to have a good deal of pioneering spirit to become a dedicated 99/4A fanatic. Jim has provided me with a few phone numbers, but by then it was almost time for me to move on. I have been able to make contact with Irwin Holt, the club's SYSOP. Irwin is a remarkable guy. He is as dedicated as our past and present SYSOP with one difference: Irwin is blind. He runs the BBS without a monitor or printer. He writes and debugs his XB programs, updates the BBS and does all the work it involves without help and without sight. How is it possible you may well ask. Irwin has written several programmes to transpose files and programmes to speech. He is able to listen to the written word. Little does one realise the joy of achievement against odds until such an encounter. I lay awake that night deep in thought for many hours.

This was an experience that I will for ever remember. On the other hand if you know someone with the same handicap, Irwin would be happy to pass on his programmes. It gives a lot of food for thought!

The 19th of May was set aside to visit Myarc and meet Lou Phillips. It is not as simple as it sounds. Basking Ridge is related to Newark like Campbelltown is to Sydney. The options were a taxi at \$US50 each way or a rent-a-car at \$US100 for the day. Myarc operates from Lou's house, which is a well kept old 3 storey mansion which dates back to just post First World War period. It is a large home and is filled with Geneves and other Myarc products. Lou is not an easy subject for a lengthy interview. He spends most of his time on the phone, so I had ample time to get to first base with the new computer during the numerous and lengthy phone calls.

I met Paul Charlton, the author of Fast Term, who works for Lou. He was doing his best to write some routines for Geneve until I dropped in and took him away from his job.

One can hardly open a TI related publication without finding some comment about Myarc and Lou. He is branded by these quite often as unreliable, too many

unfulfilled promises, and other not very complimentary remarks. I was determined to meet him and get a first hand impression of the guy. Well I'm glad that I did. Lou is a remarkable man. He knows TI and the 99 inside out. I've never met anyone with such wealth of knowledge about a product before! I do understand the reasons for those not yet fulfilled promises. Lou is a perfectionist, it is all in his mind, but he does underestimate the time it takes to bring a complicated piece of hardware to perfection. I have often wondered why did he design his brand new Geneve around the no longer available PE Box. The answer is, I am sure, he did not realise how long it would take to complete it and debug it. The computer John Kewan demonstrated in 1986 was nothing more than a prototype. The finished product is as far ahead of all current model home and small business computers now than the TI-99/4A was in 1980. It is incredibly flexible, versatile and very fast! The NTSC model is completed and stocked by the Myarc distributors now. It is selling at \$US500 with the 84 key console and about \$US40 more with the enhanced 95 key console. The mother board fits into the PE Box and has 672K RAM on board. From this, 544K is addressable and the remaining 128K is VDP memory. Any program may be 64K long and if additional Myarc RAM Cards are fitted in the PE Box then variable data may occupy up to 1.5MB maximum. It uses 16 bit addressing and its clock speed is 12 MHz. The speed is selectable in the 4A mode in six steps (1-6). Speed 1 is about 10% faster than standard 4A while speed 6 is about 300% faster. This option is used mainly for games. The 80 column format is standard. Multiplan will work in 40 column format unless 2 of its original files are replaced with those supplied by Myarc. The Geneve will work in true multitasking mode. Three or four terminals may access the computer at the same time and the operation will be transparent to the users. Monitors are selectable. One can use multiple monitors where files may be displayed on one screen and the program run on the other. It is not compatible with the TI P-Code card, but any disks produced by TI-Pascal mode may be run. Lou said that it may even be possible to use it with the P-Code card. He has not tried it since the last modification which affected this part of the system. The TI Speech Synthesiser will not run as is, however an adapter is already available for it (RAVE 99).

Most of the above features were demonstrated to me by Paul Charlton, and I was impressed.

The package comes complete with the Geneve Card resident in the PE Box, a standard or enhanced keyboard, a 350 page manual written in a TI like style and format and 5 disks. These contain the BASIC Interpreter, which is a revised and updated Extended BASIC. Some of its features:- Strings may be 4K long, one can do everything in bit map graphics mode and others not present on the TI XB module. A Myarc Pascal disk is one of the five. Two disks contain the DOS. It is called MDOS for Myarc DOS. This is a UNIX or MSDOS like system. The fifth disk contains the 80 column word processor and the already mentioned Multiplan patch files. Well I have to end the Geneve list here otherwise our friendly editor may have to use his red pen.

Lou assured me that the PAL version will be ready in about 4-5 weeks. He may have guessed my thoughts, as he hastily produced the PAL circuit drawing to convince me that it is indeed ready.

What is its future prospects? Well I am not going to bet either way. I believe that Lou deserves a win. It is a great computer.

The other new Myarc product is the hard disk controller card. His demonstration (Geneve) work horse had one one connected. A 20 MB Hard Disk drive was hitched up to it filled with files and programs. Paul demonstrated the ease of access through a hierarchy of directories. You can fill it with as many files you like, nothing gets lost! I decided there and then that I must have one of these! Alas the old story, it is 4-5 weeks away. This time it's disk manager software is



lacking. The card will support any ST506 industry standard hard disk drives, but the SCSI type drives will not work. The card will support three 5.25 inch floppy disk drives besides the hard disk. The US retail price is set at around \$250 mark. My evaluation of this long awaited card: Anyone who knows the whereabouts of an el-cheapo 20 MB hard disk drive is asked to contact the author.

My next stop was in the middle of TI territory - Lubbock Texas. The visit was not connected with TI, and I religiously avoided going near the impressive TI complex. I have visited this Fort Knox like establishment before, so I know that one can gain no worthwhile information there. It is like visiting the treasury department in Canberra to seek advice on how to save tax. again I was unable to locate the local TI-99ers club due to lack of valid contact name, address and phone number. By the way Lubbock must rank high for the title of "the hardest to reach USA city". It has no direct flights from almost anywhere to anywhere.

Without doubt the Los Angeles area - my next and last stop - is by far the best place to do your shopping. You can find almost everything there at competitive prices. Furthermore, being the port of departure for home, one does not have to lug the junk around from town to town. The LA area is very large, getting from one place to the next can be very expensive if it is done by taxis. On the other hand using the not so rapid RTD (Rapid Tourist District) buses can get you to Long Beach from the airport for \$1.20. This is a distance of about 45 miles.

From the viewpoint of a 99/4A user the highlight of Los Angeles is not the Queen Mary, not Disneyland nor the Spruce Goose but Tex-Comp. One can reach the Tex-Comp warehouse in Northridge, which is not far from Granada Hills. Assuming that you stay in one of the hotels near the international airport - and you definitely should do so if you travel with more than one small overnight bag - then you can fly over by helicopter, hire a car, book a taxi or go by the RTD bus. The last option will leave you with about \$US150 more to spend at Tex-Comp. The proprietor Gerald L. Price is a friendly and helpful guy who knows absolutely everything you wish to know about your favourite 99/4A. he is accustomed to dealing with overseas customers and will pack your treasures with such expertise that it will survive the antics of the most sadistic luggage handling staff. My colour monitor purchased for \$180 arrived in better condition than I did. The Tex-Comp warehouse is only open between 6pm and 9pm. Gerald manages to keep it full with all kinds of TI goodies. The prices are reasonable, although for mail order items one can double the advertised US prices. This is due to the unfavourable exchange rates, the combined Australian duty and sales tax and freight. In general a \$US100 item sent over will cost you \$A207. Tex-Comp carries many items not listed in the catalogue. Further Gerald is well informed about the availability of other items not stocked by him. A visit to the warehouse is like attending a regional meeting. Customers will exchange ideas, information is passed on, thus it is unlikely that one can leave in a hurry. I was kindly transported back to the bus depot by one of the customers well after 9:30pm.

To sum up, several specialised outlets in different US states still cater for the large demand for TI-99/4A original and third party hardware and software. Individual shopping through mail order catalogue is not the most advantageous choice. Group buying is the most cost effective means to obtain the higher priced items. Bulk buying discounts may be as high as 30-35%. Members should promote bulk buying deals through the TISHUG Shop to obtain US made hardware. To prove the point I have placed an order with Myarc for 5 Hard disk controller cards which will greatly reduce the ultimate Australian price.

Through my interest in the 9/4A I made new friends, learned more about the computer and made the otherwise boring business trip a memorable occasion.

## THE COMMUNICATORS

Special Interest Group for Users  
of the TEXPAC Bulletin Board Service.  
by Ross Mudie, SYSOP, 5th July 1987.

### 1. LOG ON PROBLEMS.

Since the shorter log-on procedure on the BBS has been introduced a number of members of the BBS have experienced problems with logging on. I have observed that some modems give unpredictable results when they are switched on line whilst the first HIGH tone is on the line from the BBS modem. I recommend that users wait for the HIGH tone to be replaced by the LOW tone from the BBS modem BEFORE switching your modem on line. This should overcome most of the log on problems, including the problem of the screen colour not changing to white on blue when TEII is in use.

### 2. NEW DISK DRIVE ON THE BBS.

TISHUG has purchased an additional double sided disk drive for the BBS which has been placed in service as the mail disk drive. This doubles the capacity of the mail system and as a result 686 sectors are available for the storage of mail. The BBS is now equipped with three double sided half height disk drives, the other 2 being used for operating system, programs & news files.

The remaining 32 sectors on the mail disk are used for the User File, Caller Number and reserved as a safety factor against the disk being filled completely which could crash the system.

### 3. BBS USAGE.

Usage of the BBS fell in the latter part of May and through June, possibly due to the cooler weather and people's computers not being in the warmest part of their abode. During June a total of 64 members logged on to the BBS in 411 different calls, occupying the BBS for 124 hours 15 minutes.

Members advertisements have also diminished to an all time low, in contrast to earlier in the year when several members were selling their equipment prior to opting out of the TI99/4A scene.

In response to a member's request, the advertisements from the BBS will be taken along to the TISHUG meetings for all members to see. TISHUG members who are not on the BBS can use the service by asking a friend who is on the BBS to place the add, or adds can be given in writing to the SYSOP at meetings, or posted to PO Box 214, Redfern, 2016.

### 4. PROGRAMS ON THE BBS.

Each month a selection of programs and files of interest are placed on the BBS. The programs are in TI Basic, Extended Basic & Extended Basic with imbedded assembly. All these programs can be downloaded with TI BASIC (using OLD RS232) and saved to disk or tape, but a 32K expansion must be connected to allow the programs containing assembly to be run. The file PROG INFO in the BBS NEWS menu describes the system under which the programs are run. Those marked X/BA or X/Ba are Extended Basic and require 32K memory expansion.

Due to current limitations in the BBS program the size of downloadable programs is limited to 40 sectors. Users are invited to request programs or files that they would like to have on the BBS. This includes items previously on the BBS or from TISHUG's extensive Software library. Send your requests to the SYSOP on the BBS using the electronic mail feature.

## Tigercub Tips

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Over 130 original programs in Basic and Extended Basic, available on cassette or disk, now reduced to just \$2.00 each, plus \$1.50 per order for cassette or disk and PP&M. Cassette programs will not be available after my present stock of blanks is exhausted.

Descriptive catalogs, while they last, \$1.00 which is deductible from your first order.

Tigercub Full Disk Collections, reduced to \$10 postpaid. Each of these contains either 5 or 6 of my regular \$2 catalog programs, and the remaining disk space has been filled with some of the best public domain programs of the same category. I am NOT selling public domain programs - they are a free bonus!

TIGERCUB'S BEST, PROGRAMMING TUTOR, PROGRAMMER'S UTILITIES, BRAIN GAMES, BRAIN TEASERS, BRAIN BUSTERS!, MANEUVERING GAMES, ACTION REFLEX AND CONCENTRATION, TWO-PLAYER GAMES, KID'S GAMES, MORE GAMES, WORD GAMES, ELEMENTARY MATH, MIDDLE/HIGH SCHOOL MATH, VOCABULARY AND READING, MUSICAL EDUCATION, KALEIDOSCOPIES AND DISPLAYS

NUTS & BOLTS (No. 1), a full disk of 100 Extended Basic utility subprograms in merge format, ready to merge into your own programs. Plus the Tigercub Menuloader, a tutorial on using subprograms, and 5 pages of documentation with an example of the use of each subprogram. Reduced to \$15.00 postpaid.

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\* NUTS & BOLTS #3 is now \*  
\* ready, another full disk \*

\* of 140 new merge-format \*  
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TIPS FROM THE TIGERCUB, a full disk containing the complete contents of this newsletter Nos. 1 through 14, 50 original programs and files, reduced to \$10 ppd.  
TIPS FROM THE TIGERCUB VOL. 2, another diskfull, complete contents of Nos. 15 through 24, over 60 files and programs, also just \$10  
TIPS FROM THE TIGERCUB VOL. 3, another 62 programs, tips and routines from Nos. 25 through 32, \$10 postpaid.  
TIPS FROM THE TIGERCUB VOL. 4, another 48 programs and files from issues 33 through 41, also \$10 postpaid.

I'm very sorry about the error in the BXB routine in Tips #40. The "program to write a program" generated line number 32000 instead of 30002. Here is the correct line -

```
110 OPEN #1:"DSK1.BXBDATA",V
    ARIABLE 163,OUTPUT :: PRINT
    #1:CHR$(117)&CHR$(50)&"[[[
    $"&CHR$(190)&CHR$(199)&CHR$(
    136)&M$&CHR$(0)
```

The Hyphenated Fill and Adjust in Tips #41 will crash if the file contains a line with one character too many, which may be only an unnecessary control character. This fix will help -

```
300 IF LEN(M$)<=L THEN 310 :
    : CALL SOUND(200,110,0,-4,0)
    :: PRINT M$;" is";LEN(M$);"c
    haracters long";"Truncated t
    o ";SEG$(M$,1,L):"OK? (Y/N)"
    305 CALL KEY(3,K,S):: IF S=0
    THEN 305 ELSE IF K<>89 THEN
    STOP ELSE M$=SEG$(M$,1,L)
    310 PRINT #2:M$ :: IF EOF(1)
    <>1 THEN 220 ELSE CLOSE #1 :
    : CLOSE #2
```

I know that this line is wrong, but key it in just as it's printed, and see what kind of error message you get -

```
100 !DISPLAY AT(3,1):"Progra
m must be SAVED in:"MERGE fo
rmat."
```

A friend asked me for a program to help him solve the Scram-Lets puzzles in our local newspaper, so I rewrote the Anagrammer that was published way back in Tips #12. It will print out all possible combinations of any 3- to 6-letter word, or only those which have one or two letters in specified

positions.

```
100 CALL CLEAR :: DISPLAY AT
(3,5)ERASE ALL:"SCRAM-LETS S
OLVER" :: ! by Jim Peterson
110 DISPLAY AT(8,1):"OUTPUT
TO? I":(1) SCREEN":(2)
    PRINTER" :: ACCEPT AT(8,12)
VALIDATE("12")SIZE(-1):P ::
P=P-1
120 IF P=1 THEN DISPLAY AT(1
2,1):"PRINTER? PIO" :: ACCEP
T AT(12,10)SIZE(-18):P$ :: O
PEN #1:P$
130 PL(1),PL(2)=0 :: L$(1),L
$(2)=" :: DISPLAY AT(5,1)ER
ASE ALL:"TYPE A 3-,4-,5- OR
6-LETTER WORD " :: ACCEPT A
T(6,6):A$ :: W=LEN(A$):: IF
(W<3)+(W>6)THEN 130
140 DISPLAY AT(14,1):"SEARCH
FOR COMBINATION WITH:"LETT
ER IN KNOWN POSITION? N" ::
ACCEPT AT(15,27)VALIDATE("YN
")SIZE(-1):Q$ :: IF Q$="N" T
HEN 180
150 DISPLAY AT(17,1):"LETTER
?" :: ACCEPT AT(17,9):L$(1):
: DISPLAY AT(19,1):"POSITION
?" :: ACCEPT AT(19,11):PL(1)
160 DISPLAY AT(21,1):"ANOTHE
R LETTER/POSITION? N" :: ACC
EPT AT(21,26)VALIDATE("YN")S
IZE(-1):X$ :: IF X$="N" THEN
180
170 DISPLAY AT(21,1):"LETTER
?" :: ACCEPT AT(21,9):L$(2):
: DISPLAY AT(23,1):"POSITION
?" :: ACCEPT AT(23,11):PL(2)
180 PRINT #P :: FOR J=1 TO W
    :: B$(J)=SEG$(A$,J,1):: NEX
    T J :: FOR J=2 TO W :: IF B$(
    J)>=B$(J-1)THEN 220
190 T$=B$(J):: FOR L=J-1 TO
1 STEP -1 :: B$(L+1)=B$(L)
200 IF B$(L-1)>=T$ THEN 210
    :: B$(L)=T$ :: GOTO 220
210 NEXT L
220 NEXT J
230 FOR A=1 TO W :: FOR B=1
    TO W :: IF B=A THEN 440
240 FOR C=1 TO W :: IF (C=A)
    +(C=B)THEN 430
250 IF W=3 THEN 310
260 FOR D=1 TO W :: IF (D=A)
    +(D=B)+(D=C)THEN 420
270 IF W=4 THEN 320
280 FOR E=1 TO W :: IF (E=A)
    +(E=B)+(E=C)+(E=D)THEN 410
290 IF W=5 THEN 330
300 FOR F=1 TO W :: IF (F=A)
    +(F=B)+(F=C)+(F=D)+(F=E)THEN
    400 ELSE 340
310 W$=B$(A)&B$(B)&B$(C):: I
    F W$<=V$ THEN 430 ELSE 350
320 W$=B$(A)&B$(B)&B$(C)&B$(
    D):: IF W$<=V$ THEN 420 ELSE
    350
330 W$=B$(A)&B$(B)&B$(C)&B$(
    D)&B$(E):: IF W$<=V$ THEN 41
    0 ELSE 350
340 W$=B$(A)&B$(B)&B$(C)&B$(
    D)&B$(E)&B$(F):: IF W$<=V$ T
    HEN 410
350 IF Q$="N" THEN 380
360 IF SEG$(W$,PL(1),1)<>L$(
    1)THEN 390
370 IF X$="N" THEN 380 ELSE
    IF SEG$(W$,PL(2),1)<>L$(2)TH
    EN 390
380 PRINT #P:W$&" " :: G=G+1
390 V$=W$ :: ON W-2 GOTO 430
```



```

,420,410,400
400 NEXT F
410 NEXT E
420 NEXT D
430 NEXT C
440 NEXT B
450 NEXT A
460 PRINT #P: " ";G;"TOTAL
COMBINATIONS." : : : G=0 : :
V$="" : : PRINT "PRESS ANY K
EY"
470 CALL KEY(O,K,S):: IF S=0
THEN 470 ELSE 130

```

And here is a much-improved XBasic version of the Adder-Upper which first appeared in Tips #13. I find it very useful in adding up several categories of figures in one pass.

```

100 CALL CLEAR : : CALL SCREE
N(16):: FOR SET=1 TO 14 : : C
ALL COLOR(SET,5,1):: NEXT SE
T
110 DISPLAY AT(3,4)ERASE ALL
:"TIGERCUB ADDER-UPPER" : : "T
o add up several categories"
:"at one time." : : "Input cat
egories - END when" : : "finishe
d"
120 CALL KEY(3,K,S):: DIM C$(
22),T(22)
130 X=X+1 : : DISPLAY AT(12,1
):"Category #";STR$(X):: ACC
EPT AT(12,13):C$(X):: IF C$(
X)="END" THEN X=X-1 : : GOTO
170
140 A$=SEG$(C$(X),1,1):: IF
POS(F$,A$,1)=0 THEN F$=F$&A$
: : IF X<17 THEN 130 ELSE 17
0
150 DISPLAY AT(15,1):"Code 1
etter ";A$;" already":"used.
":"Pick another code letter"
: : ACCEPT AT(17,26)SIZE(1):
A$
160 IF POS(F$,A$,1)<>0 THEN
DISPLAY AT(15,1): : : : : :
GOTO 150 ELSE F$=F$&A$ : : C$(
X)=A$&C$(X):: DISPLAY AT(15
,1): : : : : : : IF X<17 THEN 1
30 ELSE 170
170 CALL CLEAR : : R=2+(X>8):
: FOR J=1 TO X : : DISPLAY AT
(R,1):"(";SEG$(C$(J),1,1);"
";SEG$(C$(J),2,255):: R=R+2+
(X>8):: NEXT J
180 DISPLAY AT(R+2,1):"Categ
ory ";F$ : : DISPLAY AT(R+4,1
):"Amount"
190 DISPLAY AT(24,1):"Use mi
nus value to subtract"
200 ACCEPT AT(R+2,11+LEN(F$)
)SIZE(1)VALIDATE(F$):Z$ : : Y
=POS(F$,Z$,1)
210 ACCEPT AT(R+4,8)VALIDATE
(NUMERIC):A : : T(Y)=T(Y)+A :
: DISPLAY AT(Y*(2+(X>8)),20)
:T(Y):: GOTO 200

```

Can you figure this one out? (I can't!) -

```

100 DISPLAY AT(3,4)ERASE ALL
:"ILLOGICAL COMPUTER!!": : "
by Tigercub"
110 DISPLAY AT(7,1):"100 IF
A=2 THEN IF B=2 THEN C=4 ELS
E IF A=2 THEN IF B=3 THEN C=
6 ELSE IF A=3 THEN IF B=3 TH

```

```

EN C=9 ELSE IF A=3 THEN IF B
=4 THEN C=12 ELSE C=9"
120 DISPLAY AT(14,1):"Why ca
n't you get C to ":"equal 9
or 12 or 99?"
130 DISPLAY AT(18,1):"A? " :
: ACCEPT AT(18,4):A : : DISPL
AY AT(20,1):"B? " : : ACCEPT
AT(20,4):B
140 IF A=2 THEN IF B=2 THEN
C=4 ELSE IF A=2 THEN IF B=3
THEN C=6 ELSE IF A=3 THEN IF
B=3 THEN C=9 ELSE IF A=3 TH
EN IF B=4 THEN C=12 ELSE C=9
9
150 DISPLAY AT(22,1):"C=";C
: : GOTO 130

```

This might come in handy to dress up a program -

```

100 CALL CLEAR : : CALL COLOR
(2,5,16):: CALL HCHAR(1,1,42
,768)
110 X=X+1 : : DISPLAY AT(X,9)
:*****" : : DISPLAY
AT(X+1,9):"PRESS ANY KEY" : :
DISPLAY AT(X+2,10):"TO CONT
INUE"
120 CALL KEY(O,K,S):: ON S+1
GOTO 110,130
130 !continue program here

```

Or, if you'd rather do it backwards -

```

100 CALL CLEAR : : CALL COLOR
(2,5,16):: CALL HCHAR(1,1,42
,768)
110 FOR X=10000 TO 1 STEP -1
: : DISPLAY AT(X+2,9):"*****
*****" : : DISPLAY AT(X+1,
9):"*TO CONTINUE*" : : DISPLA
Y AT(X,9):"PRESS ANY KEY"
120 CALL KEY(O,K,S):: ON S+1
GOTO 130,140
130 NEXT X
140 !continue program here

```

You might find this one useful -

```

100 ! PAINT CALCULATOR by Ji
m Peterson
110 CALL CLEAR : : FOR SET=1
TO 12 : : CALL COLOR(SET,2,8)
: : NEXT SET : : CALL SCREEN(5
) : : CALL KEY(3,K,S):: ON WAR
NING NEXT
120 DISPLAY AT(3,7)ERASE ALL
:"PAINT CALCULATOR" : : "To de
termine the amount of":"pain
t needed for a room."
130 DISPLAY AT(8,1):"Is the
room a regular square or rec
tangle? Y" : : ACCEPT AT(9,16
)SIZE(-1)VALIDATE("YN"):BEEP:
Q$ : : IF Q$="Y" THEN 160
140 DISPLAY AT(11,1):"How ma
ny rectangular areas":"does
the room contain?" : : CALL A
CCEPTER(12,24,A):: IF A=1 TH
EN 160
150 FOR B=1 TO A : : DISPLAY
AT(3,10)ERASE ALL:"AREA #";B
: : GOTO 170
160 CALL CLEAR
170 DISPLAY AT(5,1):"How hig
h is the ceiling?" : : " ft.
in." : : CALL ACCEPTER(6,2
,HF)
180 CALL ACCEPTER(6,9,HI)::
HI=HI/12 : : H=HF+HI

```

```

190 DISPLAY AT(8,1):"How man
y walls?" : : CALL ACCEPTER(8
,17,W):: CALL HCHAR(5,1,32,6
40)
200 FOR J=1 TO W : : DISPLAY
AT(5,10):"WALL #";J : : "Width
ft in" : : CALL ACCEPT
ER(7,7,WF)
210 CALL ACCEPTER(7,13,WI)::
WI=WI/12 : : WW=WF+WI : : SQ=
SQ+H*WW
220 DISPLAY AT(11,1):"How ma
ny doors, windows or":"other
areas not to be":"painted i
n wall #";J;"?"
230 CALL ACCEPTER(13,19,D)::
IF D=0 THEN 280
240 FOR L=1 TO D : : DISPLAY
AT(15,1):"AREA NOT TO PAINT
#";L : : "Width ft in" : :
CALL ACCEPTER(17,10,WDF)
250 CALL ACCEPTER(17,16,WDI)
: : WDI=WDI/12 : : WD=WDF+WDI
260 DISPLAY AT(19,1):"Height
ft in" : : CALL ACCEPTER(
19,11,HDF)
270 CALL ACCEPTER(19,17,HDI)
: : HDI=HDI/12 : : HD=HDF+HDI
: : SQ=SQ+WD*HD : : NEXT L
280 NEXT J : : DISPLAY AT(21,
1):"Paint the ceiling?" : : A
CCEPT AT(21,20)SIZE(1)VALIDA
TE("YN"):QQ$ : : IF QQ$="N" T
HEN 320
290 CALL HCHAR(5,1,32,640)::
DISPLAY AT(5,1):"Ceiling di
mensions" : : " ft in by
ft in" : : CALL ACCEPT
ER(7,2,CWF)
300 CALL ACCEPTER(7,8,CWI)::
CWI=CWI/12 : : CW=CWF+CWI
310 CALL ACCEPTER(7,17,CLF)
: : CALL ACCEPTER(7,23,CLI)::
CLI=CLI/12 : : CL=CLF+CLI : :
SQ=SQ+CW*CL
320 CALL HCHAR(5,1,32,640)::
IF Q$="Y" THEN 340
330 NEXT B
340 DISPLAY AT(3,1)ERASE ALL
:"Total of";INT(SQ+.5);"squa
re feet."
350 DISPLAY AT(5,1):"How man
y square feet will":"one gal
lon of your paint":"cover?"
360 ACCEPT AT(7,8)SIZE(3)VAL
IDATE(DIGIT):BEEP:SF : : DISPL
AY AT(9,1):"How many coats?"
: : CALL ACCEPTER(9,17,C)::
G=SQ/SF*C : : G=INT(G+.5)
370 DISPLAY AT(15,1):"You wi
ll need";G;"gallons or":"G*4;
"quarts of paint."
380 CALL KEY(O,K,S):: IF S=0
THEN 380 ELSE STOP
390 SUB ACCEPTER(R,C,Q):: AC
CEPT AT(R,C)SIZE(2)VALIDATE(
DIGIT):BEEP:Q : : SUBEND

```

**Cold Boot:** What you get when you kick an Eskimo.





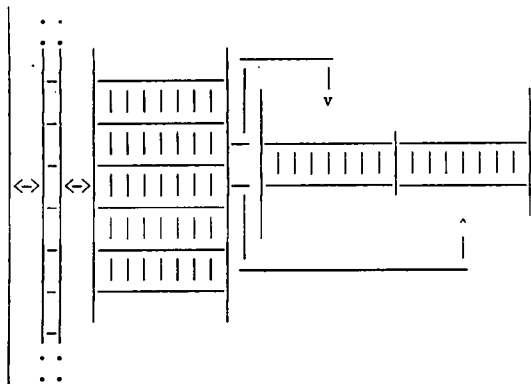
\*\*\*\*\*  
 \* ANOTHER VIEW OF ASSEMBLY \*  
 \*\*\*\*\*

| by ARTO HEINO|

How many TIers are struggling to understand how to write ASSEMBLY language programs. Do I see a lot of hands? Well.. maybe we should look at one of the basic concepts that should be made TOTALLY clear to you.

## 1. CPU MEMORY

Understanding the memory concept can be the beginning or the end to most of us. Try thinking of the computer memory as a long line with 65536 segments on it and on each segment you have 8 smaller segments.eg..



Each of the smaller segments we will call a BIT, and each group of 8 we will call a BYTE and 2 BYTES we will call a WORD.

The TMS 9900 processor looks at the memory as 32768 WORDS of memory. The TMS 9928 VDP processor looks at its memory as 16384 bytes of memory.

This double set of processors has got most users confused. There are 4 memory locations in the TMS 9900 MEMORY area that are set aside for the VDP MEMORY control, not to mention that GRAM has 4 memory locations as well.

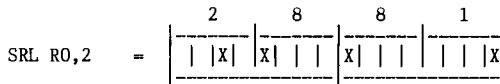
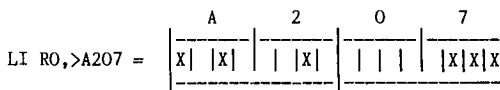
Let's look at what an assembly instruction does to the CPU MEMORY.

```
LI RO,>A207
SRL RO,2
```

Here is a breakdown:

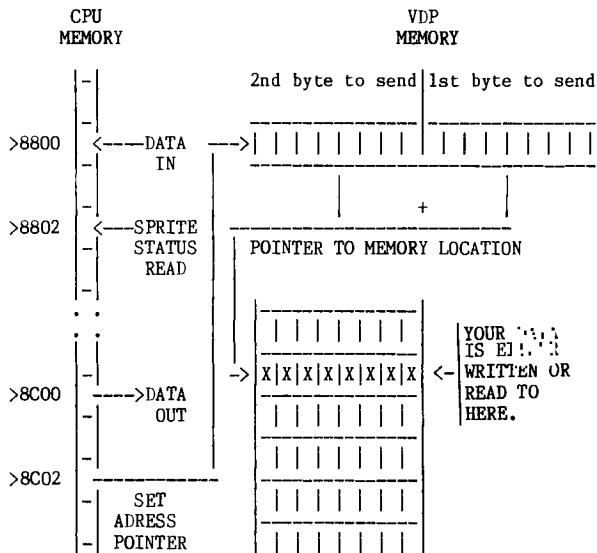
- LI = Load Immediate meaning PUT IN
- RO = Register Zero actually a memory location made up of TWO BYTES or 16 bits or ONE WORD
- >A207 = Hexadecimal value ">" means hexadecimal
- SRL = Shift Right Logical move the bits to the right by the amount after the comma

A visual breakdown:



## 2.VDP MEMORY

To understand how the TMS 9900 can control the VDP memory try to think of the memory location >8C02 as a hole in the line where you can put the address of the memory location you want into. This will prepare the VDP processor for either a READ data or WRITE data operation, by sending a byte value to >8C00 will send that byte to your address location in VDP RAM. To READ a BYTE from VDP RAM just read the value at >8800.. SIMPLE!!



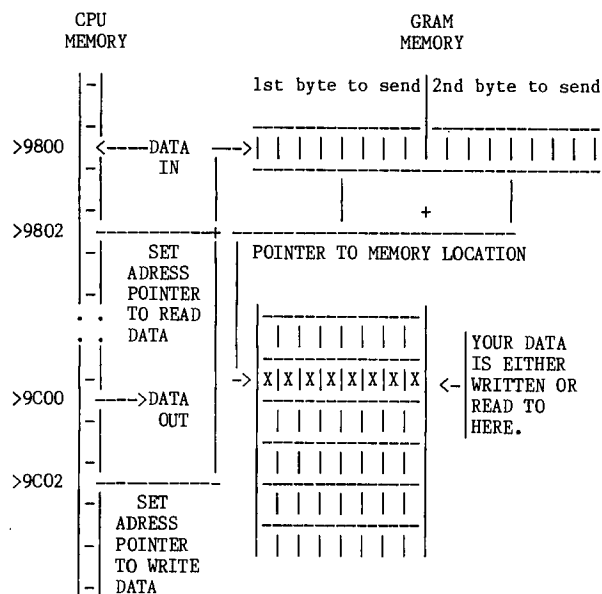
Let's look at how you display an ASCII character on the screen.

```
LI RO,>018A VDP SCREEN ADDRESS AREA
LI R1,>4100 YOUR DATA AT LEFT OF WORD
SWPB RO SWAP RO TO SEND >8A FIRST
MOVB RO,@>8C02 SEND IT TO VDP
SWPB RO SWAP RO TO SEND >01 SECOND
MOVB RO,@>8C02 SEND IT TO VDP
NOP WAIT
MOVB R1,@>8C00 SEND YOUR DATA BYTE
```

## 3. GRAM MEMORY

This is type of memory is unique to our 4A's , and possibly the most misunderstood of the features that our TI has.

The concept of writing and reading to memory is very similar to the VDP memory.



Let's look at how you send a byte of data to GRAM memory.

```

LI RO,>068A GRAM ADDRESS
LI R1,>4200 YOUR DATA AT LEFT OF WORD
MOVB RO,@>9C02 SEND ADDRESS POINTER(1) TO GRAM
SWPB RO SWAP RO TO SEND >86 SECOND
MOVB RO,@>9C02 SEND ADDRESS POINTER(2) TO GRAM
NOP WAIT
MOVB R1,@>9C00 SEND YOUR DATA BYTE
    
```

#### 4. GLOSSERY

- MOVB = Move Byte
- SWPB = SWaP Byte
- NOP = No OPeration
- CPU = Central Processor Unit (TMS 9900)
- VDP = Video Display Processor
- RAM = Random Access Memory
- GRAM = Graphic Random Access Memory
- ROM = Read Only Memory
- GROM = Graphic Read Only memory



ASSEMBLER TIT BIT.  
By Ross Mudie, TIsHUG, 6/7/87.

This one is for people new to assembly who have just typed in a source file and attempted to assemble it. At the end of the assembly you probably missed seeing the message END ASSUMED AT xxx as it flashed briefly on the screen and you were left with the message:

```

ASSEMBLER EXECUTING
* ERROR *
I/O ERROR CODE 7
PRESS ENTER TO CONTINUE
    
```

The mnemonic END is required to tell the assembler that it has come to the end of the source file, without this the assembler assumes it has come to the end of the source file and after you press <enter> the object disk file will be properly closed, providing that the disk is still in the drive.

\*\*\*\*\*  
\* ASSEMBLER TIT-BIT \*  
\* COURTESY WEASL Inc \*  
\*\*\*\*\*

TOPIC: CREATE/S source file on Horizon Ram Disks.

An error has crept in the source code for CREATE/s for saving the 12k DSR back to disk.

As it stands it works fine for Ram disk with cru base >1000. However when set to >1200 it fails to save anything, even when it locates a valid RAM Disk.

REASON: Bus Contention

This is to say two or more data outputs on the one data line active at one time.

In the case of this software the code initiates a search starting at cru base >1000. It then tries to validate the existence of ram at location Hex 4000. If successful it then saves the cru base of the ram disk and copies the first 8K of the RAM DISK DSR to memory. Then prepares to save information to the file

DSK.ROS.PART\_XX (XX is the Version No. say 04)

However it forgets to turn off the RAM DISK DSR it was accessing. This is O.K. if cru >1000 was your base address of your ram disk because the file access using DSRLNK starts at cru >1000 to search for name DSK.ROS and turns off the cru base if search is invalid so HRD at 1000 or floppy at >1100 cru are accessed with only one DSR rom/ram on at once. Not so if ram disk cru base is >1200 or greater as turning on >1000 or >1100 results in a dual rom on line and DSRLNK errors and no file is opened or created.

SOLUTION: The problem is easily solved by inserting a 'SBZ 0' instruction prior to each 'LI R8,PAB' in the source code.

ADDENUM: If planning to experiment with assembler on the HRD's please remember those with multiple cards or base addresses greater than >1000 and test it first before dispatch if possible.

P.S. Anyone having any difficulties with HRD's could they drop me a message  
USER NAME: WEASEL

#### OTHER PROBLEMS ENCOUNTERED:

1. ROS Disk version 3.4 which has DM1000 version 3.5 does not recognise DSR above CRU address >1000 and thus two RAM Disks are not recognised.
2. MASS TRANSFER will not save to RAM Disk at CRU address >1000.
3. Sometimes when accessing the RAM Disk certain assembler programs destroy the open #F: facilities of Basic or X/B. This not only affects access for the RAM Disk but also for the floppy disk drive controller at CRU >1100.

HAPPY TI-ING SHANE

## GRAPHICS

by Jim Peterson  
(Tigercub)

In the decimal or base 10 system which we commonly use, we have the 0 and the digits 1 through 9. After we have counted to 9, we go back to 1 with a 0 after it, and then 11, 12, etc.; after 99 we go back to 1 with two 0's after it.

In the hexadecimal or base 16 system we have the 0 and the symbols 1 through 9 and A through F, so can count 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F (which is decimal 15) and then back to 10, 11, etc.; when we get to FF, the next one is 100.

In the binary or base 2 system, we have the 0 and the digit 1 - that's all! So, after we count 1, we must go right back to 1 and add a zero after it; binary 10 is therefore decimal 2 and binary 11 is decimal 3, then back to 1 with two 0's so 100 is decimal 4, then 101, 110, 111, 1000, etc.

Simple, isn't it?

Now, in decimal, 0001 is the same as 1, right? The same is true in binary.

So what? Well, the space on your TV or monitor screen occupied by a single character is actually an 8 x 8 grid of 64 dots which are either turned off (clear) or on (black, or whatever) to create the character. And to a computer, off is 0 and on is 1. For instance

```
0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0
0 1 0 0 0 1 0 0
0 1 0 0 0 1 0 0
0 1 1 1 1 1 0 0
0 1 0 0 0 1 0 0
0 1 0 0 0 1 0 0
0 1 0 0 0 1 0 0
```

That is the letter A. Now, the computer reads each horizontal line of that grid as being composed of two binary numbers, like this -

```
0000 0000
0011 1000
0100 0100
0100 0100
0111 1100
0100 0100
0100 0100
0100 0100
```

When we want to tell the computer to redefine a character, or to give a pattern to one of the ASCII above 126 which are normally blank, we must tell it which dots to turn on and off. We don't have to give it the whole 64 digits in binary, we just give it the equivalent numbers in hexadecimal, and the computer does the converting.

In the first row, 0000 is the same as 0, which is also 0 in hex, so the hex code for the first row is 00 (one zero for the left half, one for the right half). In the next row, 0011 is 11, which is 3 in hex, and 1000 is 8 in hex, so the code is 38. In the 3rd, 4th and 6th-8th lines, 0100 is 100 which is 4 in hex, so - 4 and 4. And line 5 has 0111 which is 7 in hex and 1100 which is C in hex, so the entire hex code for the capital A is 00384447C44444.

Fortunately, there are public domain programs - one of them in the User Reference Guide that came with the computer - which allow you to sketch a pattern on a grid using the arrow keys, and it is then converted by the computer into the hex code. Some of these programs allow you to sketch a pattern on a 16 X 16 grid and give you the hex code for a magnification-4 sprite, or save the pattern to a file for later use.

However, it is useful to know how the characters are actually created, because you can use the string handling functions to manipulate the hex code in many ways.

For instance, that letter A, and all the other upper case letters, have a blank top row, to provide separation between lines of print. Suppose we wanted some taller letters. We could shift the whole character one row upward, and repeat the next to bottom row to make the legs of the A longer. We need only to redefine the 16-character hex code (which we obtain by CALL CHARPAT) to consist of 12 characters starting with the 3rd character - thus, in the case of the A, consisting of 384447C4444, eliminating the 00 - and add to that the 4 characters starting with the 13th - the last 4 characters of the string.

```
100 CALL CLEAR :: FOR CH=65
TO 90 :: PRINT CHR$(CH):: C
ALL CHARPAT(CH,CH$):: X$=SEG
$(CH$,3,12)&SEG$(CH$,13,4)::
CALL CHAR(CH,X$):: NEXT CH
```

Now, suppose we wanted to turn the whole character upside down? All we have to do is pick off the hex digits two at a time and build a new code for them in reverse order.

```
100 CALL CLEAR :: FOR CH=65
TO 90 :: PRINT CHR$(CH):: C
ALL CHARPAT(CH,K$):: FOR J=1
5 TO 1 STEP -2 :: C$=C$&SEG$
(K$,J,2):: NEXT J :: CALL CH
AR(CH,C$):: C$="" :: NEXT CH
```

I thought it might be fun to see what happened if I lowered the right half of all the characters by one row. To do this, I first had to transfer the blank row from the top to the bottom. The result looks very much like the title of a horror movie, or a Halloween poster.

```
100 CALL CLEAR :: FOR CH=65
TO 90 :: PRINT CHR$(CH):: C
ALL CHARPAT(CH,CH$):: CH$=SE
G$(CH$,3,14)&SEG$(CH$,1,2)::
X$=SEG$(CH$,1,1)&"0" :: FOR
J=3 TO 15 STEP 2
110 X$=X$&SEG$(CH$,J,1)&SEG$
(CH$,J-1,1):: NEXT J :: CALL
CHAR(CH,X$):: X$="" :: NEXT
CH
```

Each of the 4-digit binary combinations is an exact opposite of some other one.

```
For instance,
1000 0001
1010 0101
1110 0111
```

The hex codes of these pairs are 00 18 24 3C 42 5A 66 7E 81 99 A5 BD C3 DB E7 FF. A character composed of these pairs will be symmetrical right to left. If it is composed of 4 of these pairs followed by the same 4 in reverse order, it will also be symmetrical top to bottom. If the pairs are selected randomly, an almost endless number of combinations are possible.

```
100 CALL CLEAR :: CALL MAGNI
FY(2):: RANDOMIZE
110 FOR J=1 TO 4 :: A$=SEG$(
" . . .3C425A667E8199A5BDC3D
BI . . .",INT(16*RND+1)*2-1,2):
: B$=B$&A$ :: C$=A$&C$ :: NE
XT J :: CALL CHAR(100,B$&C$)
120 CALL SPRITE(#1,100,2,100
.120):: B$,C$="" :: GOTO 110
```