Sydney, New South Wales, Australia $3

The Board

Sub-committees

Regional Group Contacts

Membership and Subscriptions

TIsHUG Sydney Meeting

The September Meeting will start at
2.0 pm on the 2nd September 1995
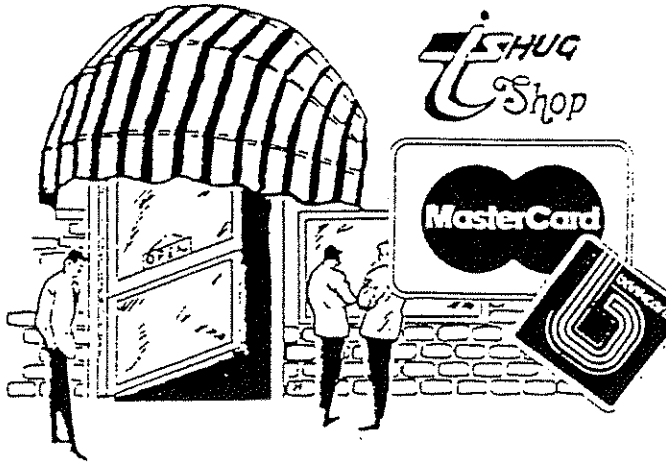at Meadowbank Primary School,
Thistle Street, Meadowbank.

INDEX

ISSN 0819-1984

IBM INDEX

FOR SALE

DESKJET PORTABLE PRINTER

For just $250;00 you could own this supurb Hewlett Packard portable printer, it comes with a cut-sheet feeder which connects easly to the printer and provides no-hands sheet feeding. Holding up to 50 sheets of 16 lb.(60 g/m2) paper or 40 sheets of 20lb.(90g/m2) paper, it gives you nore convenience, especially when printing multi-page documents. Other types of MEDIA you can use are: transparency film, labels, coloured photocopy, bond, letterhead paper and preprinted forms

With this printer you are able to print in PORTRAIT mode or LANDSCAPE mode

Print speed: Letter quality mode 167 cps at 10 cpi
           Draft quality mode 240 cps at 10 cpi

The very easy to follow user's guide which is filled with 14 chapters of usefull information

Power supply and all interface cables
Plus a spare print head
Rechargeable battery installs easily in the printer and last for up to 100 pages of printing. Great for when you print away from the office or home, It charges in the printer. The battery is not supplied.

This printer is currently on sale in one of the leading electronics stores for $499:00

I am sure that the first person to see this deal will buy it, so bring your noney and see the TIsHUG shop for an on the spot demo.

P.C. COMPONENTS

CD-ROM "PANASONIC CK563 Double Speed (S/H) ————— $ 110.00

"SOUND BLASTER PRO2 SBS30" Card (NEW with DISKS) —- $ 60.00

AUDIO CABLE FOR CD-ROM ————————————— $ 10.00

"SOUND BLASTER SB30" LARGE TWIN SPEAKERS ———— $ 22.00

14" KTX SVGA MONITOR (1024x768) (S/H) ——————— $ 190.00

386 DX-33 MOTHERBOARD with CPU ———————— $ 60.00

HARD DISK DRIVES

20 mB "CONNER" HDD IDE ————————————— $ 25.00

42 mB "NEC" SCSI HDD 3.5" ————————————— $ 50.00

SCSI CONTROLLOR "LONGSHINE" for above drive 8bit ——— $ 30.00

1275 mB "CONNOR" HDD (Mode 4) ———————— $ 630.00

RAM MEMORY

30 Pin SIMM 70ns 1mB   (NEW) ——————————— $ 55.00

30 Pin SIMM 60ns 1mB   (NEW) ——————————— $ 70.00

72 Pin SIMM 70ns 4mB with parity (NEW) ——————— $ 220.00

72 Pin SIMM 60ns 8mB N/P (NEW) ——————————— $ 440.00

GENERAL ITEMS

3.5" DISK STORAGE BOXES HOLDS 100 DISKS ————— $ 10.00

5.25" DISK STORAGE BOXES HOLDS 100 DISKS ————— $ 10.00

PARALLEL PRINTER CABLES 1.8m ————————— $ 10.00

SERIAL CABLES 1.8m ————————————— $ 10.00

KEYBOARD 101 KEY ————————————— $ 30.00

VIDIO CARD "TRIDENT" 1mB (16 million colours) ————— $ 90.00

CD-ROM PROGRAMMES

GROLLIER 95 (MULTIMEDIA ENCYCLOPEDIA) ————— $ 42.00

THE ANIMALS (MULTIMEDIA ZOO) ————————— $ 36.00

PARADISE SHAREWARE ————————————— $ 10.00

SHAREWARE GAMES PARADE (over 100 games) ———— $ 10.00

MULTIMEDIA KIT

TWO SPEED CD-ROM, SOUND BLASTER PRO2 SOUND CARD,

TWIN SPEAKERS, CABLES, SETUP SOFTWARE, 2 SHAREWARE

CD DISKS —————————————————THE LOT $ 200.00

TIsHUG SHOP

With Dick Warburton

Well, this is the month for bargains in the shop, if you want Ti software and accessories. I am cutting the prices of almost everything. If you see something you need, make me an offer. Club software stays the same, and remember that we have disks going back a long way. I am reorganizing the way the lists are presented so that you can pick out disks by the type of disk you want. All the Artist disks, and all the pics will be together. Games will be together. Utilities will be together etc.

If we run out of any particular disks we can always copy one for you. This applies particularly to the IBM disks, where I only bring the one copy. We can always use our club machine to copy a disk. We have some really excellent IBM shareware disks. If you are not sure about what is listed, please ask me or Cyril, and if you want a demo, I am sure that Percy or Cyril will always oblige.

Here are some examples.

3.5" disks
25 Ti to IBM emulator.   Great disk
26 PC Diagnostics disk
27 Blakestone 2.0
28 Raptor 2 disks
29 Doom   The one and only. 2disks
30 Apogee Games disk1
31 Apogee Games disk2
32 Apogee games disk3
33 Apogee Games disk4
34 Fauve Matisse \ In Control
35 Games and Nightowl directory
36 Claris Works for Windows
37 System Inormation disk

5.25" disks
1 As Easy AS Spreadsheet.   The best
2 Flash a Racing Program Interesting.
3 Powermenu   The best menu program
4 PC File   A really good database
5 Word Processors VDE\New York
6 Calculator Programs   Beauties
7 Virus Protection Programs   The best
8 Copy programs
9 Cad program
10 Penpal and Techwrite
11Home Program selection
12 Utilities
13 Money smith Agreat program
14 Educational programs for children
15 C tutor program
16 4 Dos the alternative to command com
17 TI to IBM Link your TI transfer text files.
18 Utilities
19 Utilities
20 Games eg Pacman
21 Games eg Demons\ Yahtze
22 Games eg Hangman
23 Games eg Rockford
24 Ti to IBM Emulator
25 Ti to IBM emulator.   Great disk

I also have a selection of modules in stock. If you have any modules you want to sell exchange or donate to the club, I 'll be pleased to see you at the next meeting.

Here is the list of what we have in stock right now.

Item			
Disk Manager 2	4 modules	$4	
Extended Basic	2 modules	$15	
Munchman	3 "	$5	
Parsec	7 "	$5	
Personal Record Keeper	1		$5
Terminal Emulator	5	$6	
Ti Invaders	4 "		$5
Touch Typing	1 "	$5	
Video Chess	1 "		$5
Video Graphs	1 "	$4	

We also have a number of tapes in stock, most of which we are selling just for the price of the tape. If you want some cheap tapes to record your music on, buy up our taped xmas music.

We have many other items including modems, electronic parts, kits, transformers, cards, all types of bits and pieces. I'll try to list many of them soon, and we are selling them cheaply. eg look in the bargain box each meeting for things like plastic kit boxes for only $5 each. Many of these items are less than a quarter of their shop price. If you can't find what you want, ask me if we have it. We may be able to get it for you.

Well I'll say bye for now and see you at the next meeting. Bring your money with you.

Dick Warburton
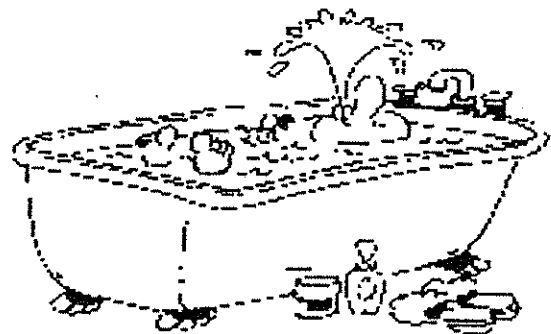
TiSHUG SOFTWARE FILE
SEPTEMBER 1995
By Larry Saunders

Diskname P140
Used= 353 Free= 5

Page Pro Pictures

PIRATE	166*I 13	PRESERVER	114*I 13
SEAHORSE	37*I 13	SEATURTLE	36*I 13

Diskname P141
Used= 344 Free= 14

Page Pro Pictures

SAILOR	164*I 13	SHELL3	13*I 13
SHIPBOTTLE	44*I 13	VACATION	79*I 13
WHALE	44*I 13		

Diskname P142
Used= 346 Free= 12

Page Pro Pictures needed by Page Pro Templates disk 143.

BEATEN	30*I 13	BOO	30*I 13
DOWNUNDER	29*I 13	DUCK	28*I 13
GUILTY	29*I 13	HORSEY	32*I 13
MINERBIRD	27*I 13	ROMANCE	25*I 13
SEXY	30*I 13	SKATE	30*I 13
SKUNKIE	27*I 13	TWOBIRDS	29*I 13

Diskname P143
Used= 252 Free= 106

Page Pro Templates. Loads as a page and needs pictures on disk 142.

ASHAMED	21*Prog	FRIEND	21*Prog
GOSSIP	21*Prog	HEARD	21*Prog
MISSYOU	21*Prog	MOVIES	21*Prog
MYDAY	21*Prog	QUICKIE	21*Prog
SHAPE	21*Prog	SOONER	21*Prog
TOGETHER	21*Prog	TYPICALDAY	21*Prog

END OF ARTICLE
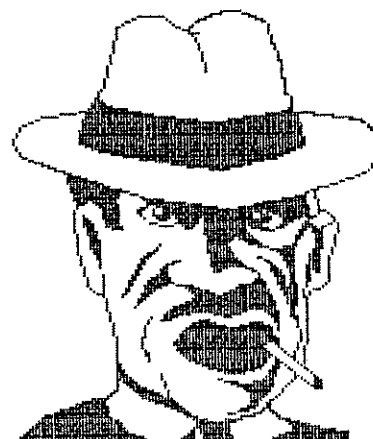
TREASURER'S REPORT

by Cyril Bohlsen

Income for previous month .... $ 753.00
Expenditure for previous month .... $ 773.54
Loss for previous month .... $ 20.54
Membership accounted for $ 000.00 of income
Shop sales .... $ 753.00 of income

The expenditure was made up of the following :-

Administration .... $ 53.95
Printing and posting of TND .... $ 241.59
Shop purchases .... $ 429.45
BBS running expenses .... $ 48.55

END OF ARTICLE

FOR SALE
AT286 IBM CLONE COMPUTER
40 mB HARD DISK ,
QUBIE EGA MONITOR
EGA GRAPHICS CARD
3.5" HD FLOPPY DRIVE
101 KEYBOARD
DESK TOP CASE
THE LOT FOR $ 275.00

Ring CYRIL (02) 639 5847

Techo-Time

from Geoff Trott

Bits and pieces

I recently received a letter from Geoff Warner in WA asking about expanding the AT card, EPROMs on RAMdisks, and the 80 column card. He had misplaced his TNDs in a clean-up and asked for information which is contained in past issues of the TND. Of course, just about everything you want to know about the TI99/4A has appeared in the TND. To help him, I decided to find all the articles on the AT card and RAMdisks and copy these for him to use to expand his system. I found this to be an interesting exercise and confirmed that the TND contains an amazing amount of very useful data. I am very careful not to lose any of my copies.

1990 was a great year for those doing hardware projects. Lou Amadio was in charge and his enthusiasm and ideas caused so many great projects to be started. It was in that year that all the documentation for how to build an AT card was located, along with articles about RAMdisks, including those from Craig Sheehan on the use of EPROMs to store the data on a RAMdisk. I was a bit involved in a number of those projects and thought I should summarise what has been done for all those who may now be interested but missed the information at the time it came out. It is the usual problem that everyone gets to a particular point in their hobby at a different time.

The AT card was produced by Peter Schubert and friends to provide a double density disk controller along with 32 Kbyte memory expansion, PIO, and RS232 all on a single card. He "borrowed" the designs for these devices from a number of different sources which allowed the DSR routines they contained to be used with only minor modifications. It was a large job and a brilliant idea which helped many members to expand with a minimum of expense, especially with the Two Way Interface, rather than the PEBox. Along the way, he saw that a MiniPE system could be designed, based on the AT card being cut up, to plug directly into the I/O port of the console. Perhaps he actually did the two projects in the reverse order, come to think of it. Nevertheless, both concepts were excellent ideas and great for members.

Then along came RAMdisks. Having one of these in a system with an AT card caused occasional major problems, such as a whole track on a floppy disk becoming unreadable. If this was the first track, the whole disk

suddenly became unreadable. This was because Peter failed to include a signal to disable access to the disk controller chip at addresses >5FF0 to >5FFF when the disk controller was not being used. These addresses are used in accessing RAMdisks. A fix is easy to install and has been detailed, both for the AT card and the MiniPE system.

For the MiniPE system, there are other problems, for which fixes are also available. Peter did not use the DBIN(H) signal for enabling data onto the data bus when reading the EPROMs and RAM expansion. He used MEMEN(L) instead, which is fine most of the time, but sometimes causes problems due to the fact that MEMEN is asserted for both reading and writing, while DBIN is only asserted for data being read into the processor. This is not a problem for the AT card as there is a bi-directional buffer chip which does use DBIN, between the card and the I/O bus. However, anyone with a MiniPE system, particularly with a RAMdisk, should make sure that the fixes have been installed if they want less problems. I have a MiniPE with RAMdisk and Bob Relyea also has one, on which I have spent many hours getting them both to work reliably. In fact Bob has EPROMs installed on his and I have just programmed some EPROMs to give him 80 column Funnelweb and 80 column Multiplan in 4 EPROMs. The other problem with the MiniPE RAMdisk relates to the loss of data on power on or off. The only way I could make the RAMdisk more reliable was to disable the WE(L) signal as soon as the power supply rail started to drop and delay its application to the RAMdisk until all transients on the power supply rail had disappeared. There is a little circuit available to do this job also which can be used on any RAMdisk.

The other areas I have looked at are: a circuit to put in the PIO cable to allow the PIO to drive any centronics type printer; console tester; programs to program and install EPROMs in a RAMdisk; and the 80 column card. Some of this article came up because I was asked by Bruce Boese to look at his system and try to make it more reliable. The system he has, was put together by an expert in metal bending and is very neat. It consists of an aluminium box with the same area as the console and about 45 mm high. Inside the box is a MiniPE system with 32 Kbyte memory expansion, PIO, disk controller, 3.5 inch single sided floppy drive, and power supply for the disk drive and disk controller. This is packaged so that the console sits on top of the metal box and a ribbon cable passes from the I/O port of the console to the MiniPE system in the box below. An addition after Bruce bought the system was to bring the disk data cable out the back to a socket so that two 5.25 inch drives could be connected externally. These are in another metal box along with a power supply. There was also another cable plugged into the back of the MiniPE box from the external drives which allows

DSK1 to be selected as either the 3.5 inch drive or one of the external drives. That particular external drive is also set up to always respond as DSK4. Of course, if you want to do something like that, Lou described how to do it in the TND.

The first problem I found was that the cable to the external drive (or its connectors) were not good. I replaced this cable, and made up a wedge so the first plug could not be pulled out of the disk drive which, solved one problem and the external drives were then OK. While using Disk Manager 2 test routines to check the system for reliability, during one of the tests, the sector being tested jumped to a number greater than the total number of sectors on the disk. This did not happen with my disk controller. On installing the DBIN fix to Bruce's MiniPE disk controller card, this problem disappeared. I then installed the DBIN fix on the other board of the MiniPE system, just in case. Now it seems to be working quite reliably. However I did disconnect the scheme for selecting DSK1, as the two disks used different head step times. A change in head step times could be incorporated into the switching, but the 3.5 inch drive is one of those very cheap devices and not very reliable in itself. So it is now permanently DSK2.

So, if you are having any problems with your system, see me at a meeting, write me a letter, or leave a message to TECHO on the BBS. I do not look at the BBS as often as I should but mainly because there are usually no messages for me when I do. Remember that your club offers the best advice at the best price.

END OF ARTICLE

FROM THE BBS

New files and programs have been loaded on on this BBS on 30/7/95.

The TI99/4A will be running as a file server in a small LAN at the SHAHZADA Endurance Horse Ride, a week long event at St Albans NSW (20 km from Wisemans Ferry) during the week 21st to 25th August 1995. The event is from 4am to 5pm daily with most activity earlier in the day. A day trip to St Albans in this week would both be an interesting day out and an opportunity to see the mighty little TI performing a task way beyond its original design capability.

Ross Mudie, SYSOP.

END OF ARTICLE

LEARN TO KNOW YOUR TI

LESSON 30

with Percy Harrison

This month we will look at arrays and the DIM() statement.

TI BASIC allows arrays with one, two, or three indices.

Arrays with one index are described first. The array itself is compared to a family, and the individual elements of the array to family members, with the index value being the "first name" of the member.

Two dimensional arrays are compared to the arrangement of numbers on a calender month page or the rectangular array of cells on the TV screen.

Three dimensional arrays are just mentioned, with no examples given.

Arrays themselves are not too difficult a concept. The trick is to see how they help in programming. There are a large variety of uses of arrays, and many do not seem to fall into recognisable categories.

One can use them to store lists of information. Connected lists also can occur. The telephone number program used in this lesson, uses two linear arrays: one for names, the other for numbers. They are indexed the same, so a single index number can retrieve both the name and number that goes with it.

Another general use of matrices is to store numbers which cannot be neatly obtained from an equation. An example would be the length in days of the 12 months.

Finally, games often use arrays to store information about the playing board.

LESSON 30 ARRAYS AND THE DIM STATEMENT

MEET THE ARRAY FAMILY

        22 F$(0)="DAD"
        24 F$(1)="MOM"
        26 F$(2)="MINDA"

Each member of the family is a variable. The F$ family

are string variables.

Here is a family of numeric variables:

```
35 N(0)= 43
37 N(1)= 13
39 N(3)= 0
41 N(4)= 0
```

The family has a "last name" like A() or B$(). Each member has a number in () for a "first name". The array always starts with the first name "0".

Instead of "family" we should say "array".

Instead of "first name" we should say "index number" or "subscript".

THE DIM() COMMAND SAVES BOXES

When the array family goes to a movie, they always reserve seats first. They use a DIM command to do this.

The DIM... command tells the computer to reserve a row of boxes for the array. DIM stands for "dimension" which means "size".

For example, the statement

```
18 DIM A(3)
```

saves four memory boxes, one each for the variables A(0), A(1), A(2) AND A(3). These boxes are for numbers and contain the number "0" to start with. Another example:

```
30 DIM A(3) ,B$(4)
```

This time, DIM reserves 4 boxes for the A() array and 5 for the string array B$(). The boxes named B$(0) through B$(4) are for strings and are empty to start with.

Rule: Put the DIM() statement early in the program, before the array is used in any other statement.

MAKING A LIST

Enter:

```
10 REM +++ IN A ROW +++
20 CALL CLEAR
30 DIM A$(5)
35 PRINT"ENTER A WORD"
40 FOR N=1 TO 5
```

```
50 INPUT A$(N)
55 PRINT
57 IF N=5 THEN 60
59 PRINT "ANOTHER"
60 NEXT N
70 PRINT
100 REM PRINT THEM
105 PRINT"HERE THEY ARE ALL MIXED UP"
106 I=INT(RND*5) + 1
120 PRINT A$(I);" ";
130 GOTO 106
```

Run. Press the FCTN CLEAR keys to stop the program. Save to tape or disk.

You can use a member of the array by itself; look at this line:

```
40 B$(2)="YELLOW SUBMARINE"
```

Or the array can be used in a loop where the index keeps changing. Lines 50 and 120 in the program "IN A ROW" do this.

MAKING TWO LISTS

Enter:

```
10 REM PHONE LIST
20 CALL CLEAR
30 DIM NA $(5), NU $(5)
40 PRINT "ENTER NAMES AND NUMBERS "
45 FOR N=1 TO 5
50 PRINT
51 INPUT "NAME? ":NA$(N)
60 INPUT "NUMBER? ":NU$(N)
65 IF N=5 THEN 80
70 NEXT N
80 I=I+1
82 IF I=6 THEN 99
85 PRINT NA$(I);" ";NU$(I);" "
90 GOTO 80
99 END
```

Run the program. Save to tape or disk.

ONE DIMENSION, TWO DIMENSION,....

The arrays which have one index are called one dimension arrays. But arrays can have 2 or 3 indices. Two dimensional arrays have their "family members" put into a rectangle like the days in a month on a calendar.

```
10 REM +++ TWO-DIM ARRAY +++
15 REM
18 CALL CLEAR
20 DIM T(5,6)
30 FOR X=0 TO 5
40 FOR Y=0 TO 6
50 T(X,Y)= X+Y
60 NEXT Y
61 NEXT X
65 REM
70 REM ------ PRINT OUT THE ARRAY
72 REM
80 FOR J=0 TO 6
82 PRINT
85 FOR I=0 TO 5
88 PRINT TAB(I*3);T(I,J);
90 NEXT I
91 NEXT J
```

Assignment 30

1. Write a program which stores the number of days in
   each month in an array. Then when you ask the user
   to enter a number between 0 and 13, it prints out
   the number of days in that month.

```
┌─────────────────┐
│ END OF ARTICLE ▶─
└─────────────────┘
```

MORE
AUTHOR'S
WANTED

CRU TESTER V3.0
By E.P.REBEL

PROGRAM PURPOSE:

   CRUTST V3.0 will enable you to better understand the
different functions of the TMS 9901 processor, which
handles interrupts, keyboard/joystick scanning and
cassette management, and control the interrupt task of
the TI-99/4A.
   You could consider CRUTST V3.0 being a diagnostic
program specially for the TMS 9901, as you can check
almost every function of this Input/Output processor.
But mainly it is meant as a learning tool.

HISTORY:

   CRUTST V1.0 was developed in may 1986. It enabled
you to inspect all input lines on the TMS 9901 and
change some of the output lines. CRUTST V2.0 allowed
control over some of the interrupt functions of the
99/4A. You could disable VDP interrupts through which
you could see the console interrupt routine not being
executed anymore because <QUIT> wouldn't response and
no screen time out occured. Better inspection of the
interrupt functions has been added in CRUTST V3.0.
Besides, the clock value is displayed and the LOAD
interrupt acts a little different. It's more complete
now and the name of program should be changed really.

USING THE PROGRAM:

   To startup the program you need the E/A module from
which you should use option 5 (RUN PROGRAM FILE). After
CRUTST V3.0 has loaded the following screen will be
displayed.

9901 CRU TESTER V3.0

```
Addr.  # Typ Function  Clock:>0000 V
===== == === ==================== =
>0000  0 CON Control                0
>0002  1 INT External interrupt     1
>0004  2 INT VDP interrupt on       1
>0006  3 INP Keyboard <=> line      1
>0008  4 INP Keyboard <SPACE> line  1
>000A  5 INP Keyboard <ENTER> line  1
>000C  6 INP                        1
>000E  7 INP Keyboard <FCTN> line   1
>0010  8 INP Keyboard <SHIFT> line  1
>0012  9 INP Keyboard <CTRL> line   1
>0014 10 INP                        1
>0024 18 OUT Keyboard select bit 2  0
>0026 19 OUT Keyboard select bit 1  0
>0028 20 OUT Keyboard select bit 0  0
>002A 21 OUT Alpha lock select bit  1
>002C 22 OUT Cassette control 1     1
>002E 23 OUT Cassette control 2     1
>0030 24 OUT Audio gate control     0
```

>0032 25 OUT Magnetic tape output 1
>0036 27 INP Magnetic tape input   1

All functions will be explaned one by one, so read on if you want to know what all those 0's and 1's mean. Some functions of CRUTST V3.0 are meant for inspecting values of the input lines on the TMS 9901, while others (mostly output lines) can be controlled by you. Furthermore most of the console interrupt routine functions can be examined. Input and output lines on the TMS 9901 are used to manage the cassette functions, scanning keyboard and joysticks and handling interrupts. All the input and output lines that are used, are shown on the screen. The value of such a line is indicated with a 0 (low level, 0V) or a 1 (high level, +5V).

All input values are updated constantly. Output values are changed only if you wish, by pressing function keys. A short example: press the <FCTN> key and you will see the corresponding input line change from 1 to 0. As you will see in the course of this manual, you have to remember many function keys. To help you CRUTST V3.0 has an online help function. To consult this press <FCTN>7 which results in:

           * 9901 CRU TESTER V3.0 *

Key: Function:
======= =============================
<CTRL>1 toggle cassette control 1
<CTRL>2 toggle cassette control 2
<CTRL>A toggle Audio gate control
<CTRL>C display Clock value
<CTRL>I display vdp Interrupt counter
<CTRL>K change Keyboard select lines
<CTRL>M toggle Magnetic tape output
<CTRL>R Reset vdp interrupt counter
<CTRL>S stop/start Sound
<CTRL>T display Time out counter
<CTRL>V toggle Vdp interrupt on/off

Bit nr: Purpose:
======= =============================
     0 control bit 9901 (CON)
  1- 6 dedicated interrupt inputs
  7-15 programmable interrupts
 16-22 dedicated I/O ports
 23-31 programmable I/O ports
INT = used as interrupt input
INP/OUT = used as input/output port

CASSETTE CONTROL:

One of the tasks of the TMS 9901 is handling the different cassette recorder functions. There are five in- and output lines on the TMS 9901 used for this. They are often indicated by CRU bit numbers (a input/output line numbering methode of the TMS 9901) or

by CRU addresses (recognizable positions for the TMS 9900 microprocessor). These values are shown in the first two columns of the screen. At the bottom you can find the five cassette functions from which you will probably recognize only four. It may be a little bit confusing but the five plugs of the cassette cable do not correspond with these five lines. The two "audio output" cables are combined which is called magnetic tape output. Why Texas didn't split the audio input cable, called magnetic tape input from now on, either I do not know. The two remote controls (indicated as cassette control 1 and 2 on the screen) has been split so you can control the cassette motors seperatly.

The CRU line you won't find on the cassette cable, called audio gate control, is not used in any known program. Maybe this will be the first time you read about it or can observe the effect. But first back to the cassette control 1 and 2 functions of CRUTST V3.0.

If you connect the remote control plugs of one or two cassette recorders, you can test the function of them by pressing <CTRL>1 (for motor of CS1) or <CTRL>2 (for motor of CS2). Notice the 1's in the last column changing in 0's. This means the motor is on or off. Pressing <CTRL>1 or <CTRL>2 more than once results in alternately putting CS1 and CS2 on and off. This task of the TMS 9901 is used when you type SAVE CS1 in BASIC.

The next line on the screen is the audio gate control. Well just put a cassette in your recorder and press play. You will hear the music or beeps via your television loudspeaker. Now press <CTRL>A and the sound is turned off. If you press <CTRL>A again the sound will return. This is what the audio gate controls. It mixes the audio input signal of the cassette with the sound and speech synthesizer sounds or not. When you have a RESET button build in your console you can notice the sound disappearing a fraction of a second when using this button. This is because the console powerup routine has to set the audio gate on first. Until this is done you won't here the cassette player.

While you were playing with <CTRL>A you will have noticed the last value on the screen changing constantly. The frequency this happens is an indication for the pitch. This CRU bit is checked when you load a program from tape. The function of the remaining bit you can guess. It's for creating the horrible sounds when you save a program. With <CTRL>M you can change the value but you are not fast enough to make it sound like one tone.

KEYBOARD AND JOYSTICK SCANNING:

Scanning the keyboard and joystick may look different to you but is in fact the same when looking at the TMS 9901. All the switches (this is what keys and joystick positions are) from keyboard and joysticks are build up in a matrix. This way you can scan only a few of the switches at a time but by selecting

different key sets or joysticks after each other the whole range can be checked. This is what the console (K)SCAN routine does. With CRUTST V3.0 you can examine 8 keys or joystick postitions at a time (that's the maximum). Notice CRU bits 3-10 all being 1's except when you press one of the indicated keys. To select another range of keys press <CTRL>K one or more times. If you counted the different sets you counted 8 (the alpha lock is a special case). So there are 8 sets from which one is selected by a 8 out of 3 decoder ic which you can find in your console. The decoder is used because only one of the key sets is active while all the 8 switches in this set are connected to the TMS 9901. Therefore you need 8 input lines of the 9901 to scan the keys (or joystick positions remember) but only three output lines to select the set. The decoder decodes these three output lines making active one and only one of the 8 sets at a time. The only key that is not in the 8*8 matrix is alpha lock. Why this is done I don't know, because there is still room in the matrix (some inputs are not used). Scanning the alpha lock key is possible when CRU bit 21 is low. This is done only one time of nine when pressing <CTRL>K. I could have chosen another function for this purpose, but didn't do it because the alpha lock scan (input) line is shared with the other keys. Strange it is? yes. For completeness here is a scheme of the matrix with all CRU bits included.

CRU BIT	FUNCTION	JOYST 2	JOYST 1	KEYBOARD						
>15	ALPHA LOCK selection	1	1	1 1 1 1	1			0		
>14	Selection bit 0(MSB)	1	1	1 1 0 0	0			*		
>13	Selection bit 1	1	1	0 0 1 1	0			*		
>12	Selection bit 2(LSB)	1	0	1 0 1 0	1	0		*		
>0A	Input bit 0 (MSBit)			Z B V C X						
>09	Input bit 1			Q T R E W CTRL						
>08	Input bit 2			A G F D S SHIFT						
>07	Input bit 3	UP	UP	1 5 4 3 2 FCTN A.LOCK						
>06	Input bit 4	DOWN	DOWN	0 6 7 8 9						
>05	Input bit 5	RIGHT	RIGHT	P Y U I O ENTER						
>04	Input bit 6	LEFT	LEFT	; H J K L SPACE						
>03	Input bit 7 (LSBit)	FIRE	FIRE	/ N M , . =						

INTERRUPTS:

The TMS 9901 handles all the interrupts for the 9900 microprocessor. Interrupts can be generated externaly or inside the TMS 9901. A build in clock can generate interrupts which are used for the cassette routines for example. The clock is a counter that can count from >3FFF (or a lower start value) downto >0000. When >0000 is reached the interrupt is generated, but only if you did allow it. CRUTST V3.0 doesn't allow it but it displays the clock value constantly. This is the fast

changing number in the top of the screen. The TMS 9901 clock is counting so fast that it counts from >3FFF to >0000 almost three times a second. So only a "few" values can be displayed and more less can be read by you (the television display is updated very slowly). The clock is programmed by turning CRU bit 0 to a 1. You won't see this value ever because this is done only at startup time when the display is not build yet. If this bit was 1 the functions of bits 1 to 10 would have changed too. They would have contained (part of) the clock value. Fortunately the control bit is 0 so you can inspect the other interrupts, from which the TI-99/4A knows two. The external interrupt has to come from one of your expansion cards for example the RS232 card. You won't see the value change unless you have build an external interrupt switch. If this interrupt appears the console interrupt routine will scan all DSR ROMs searching for the card that is causing the interrupt.

The only none mentioned interrupt is the most important one, the VDP interrupt. 50 times a second the TMS 9929 (this is 60 times a second for TMS 9918A NTSC version) will generate an interrupt. If this is allowed the TMS 9901 will pass it on to the TMS 9900 microprocessor. After a while (LIMI 2, LIMI 0 instructions in an assembler program must be encountered) the console interrupt routine will handle several tasks which have to be done 50 or 60 times a second. This is the only reason the VDP interrupt is there. You can disable VDP interrupts (this means 9901 not collecting them, NOT the VDP processor won't generate them anymore) by pressing <CTRL>V. Ofcourse another press of <CTRL>V will turn VDP interrupt on again.

The value bit in the last column becomes a 0 when the VDP interrupts. You won't see it happen when interrupt is enabled because it is done between displaying an entire screen on your television. At the time the VDP interrupt line is displayed, the value has been reset to 1 by the interrupt routine. However, if the (K)SCAN routine delays the LIMI 2, LIMI 0 instructions just a little bit, you'll see a 0 from time to time.

Because the VDP interrupt enable or disable status can't be fixed just from looking at the value that is displayed, the word on or off is added to the function discription. Since external interrupt is always enabled by CRUTST V3.0 no extra information is displayed here.

What tasks did I mean, when I talked about the tasks of the interrupt routine? First there is a screen time out counter (which is on address >83D6) which is double incremented. When it reaches >0000 the screen is blanked preventing the display burning in your television screen.

The counter is reset by the (K)SCAN routine when a new key is pressed and normaly it would take more than 10 minutes to blank the screen. To speed this up CRUTST V3.0 uses a trick and puts a high value in the screen

time out counter when a new key is pressed. You can inspect the value when you press <CTRL>T one time. To bring back the clock value you have to press <CTRL>C. Notice that the counter is reset when you press a new key and is not counting at all when you turn VDP interrupts off (<CTRL>V). To see that normaly the counter is reset to >0000, you can press <FCTN>7 and some other key. This time CRUTST V3.0 won't change the counter value so it will start at >0000 normaly. You won't see the counter pass >FFFF because the screen will be blanked at that time and only a key press will turn it on again, resetting the time out counter too.

Another function of the interrupt routine is to look if <FCTN>= is pressed to quit at the title screen. You can disable this part of the interrupt routine but this is not done by CRUTST V3.0. You can use <QUIT> normally unless... Yes, unless VDP interrupt is turned off. The routine is not called then 50 times a second remember. Try it out.

One task, automatic sprite motion can not be examined while using CRUTST V3.0. Sprites can not be displayed in 40 character mode so I can't show the automatic motion of it either. Automatic sound processing however, can be examined. Press <CTRL>S to start or stop a little tune. It isn't very original but it was the first time I included sound in one of my programs.

The last part of the console interrupt routine is hooking to a user interrupt routine. CRUTST V3.0 has one, which is a simple counter. I also could have letting it flash some part of the screen or something totaly different, as long as it shows the effect of being executed 50 times per second that isn't realy important. At program start the counter is set to >0000 and if you want to examine it you may press <CTRL>I. You even can reset this counter value by pressing <CTRL>R. Not much of a interrest unless you find it nice to stop and restart it by turning VDP interrupt off and on. Well this is it. Except for the only interrupt that is not controlled by the TMS 9901. The LOAD or sometimes called Non Maskable Interrupt. You have to build a LOAD button to examine this function of CRUTST V3.0 ofcourse. When you press it the text LOAD will be displayed in the top screen line and the program will restart a little while later. So if you quited the program you can use the LOAD interrupt to restart CRUTST V3.0.

ABOUT THE HARDWARE OF THE TMS 9901:

Maybe you have noticed that CRU values act different than you would expect. This is because of the hardware logic. Getting a line from 5V to 0V is easier than the way around. This is why pressing a key results in a 0 value. The hardware causes some strange side effects too. Pressing <FCTN>, <ALPHA LOCK> or some other keys disable functioning of the joysticks UP position. When you press <ENTER> the RIGHT position won't work. This

can be overcome by adding some diodes at your keyboard. Specially in the alpha lock case this works nicer.

Why are the TMS 9901 functions and CRU bit numbering as they are? You will have notice the absent of some numbers. This is due to the construction of the 9901. Only some of the lines can be used for detecting interrupts while others can be used as input or output lines. The help screen displays a summary of this classification. Dedicated means the lines can't be used for another function. Programmable means you have to choose to use it as an interrupt line or as input/output lines. TI used a trick to use some of the dedicated interrupt lines as keyboard input lines. Enabling one of the interrupt lines 3 to 6 would result in an interrupt when one of the right keys was pressed.

CRU bits 11 to 15 are not displayed because they are not used as interrupt inputs. Bits 28 to 31 are not used as input/output lines so they aren't displayed too. The other missing bits are unused and therefore not of any interrest.

To complete this story I have to add the following. On reset all input/output lines on the TMS 9901 act as input lines. Once you have written to them they become output lines. Reading such bit gives you the output value. The only way to revert this process is by generating a reset again. There is software reset possibility too, but I have to test it some time. Maybe it will be used in a future version of CRUTST. The only interrupt CRUTST V3.0 cannot handle is the hardware RESET. But who knows by changing the GROM (GRAM) powerup routine I will manage that too.

ABOUT THE SOURCE:

You can examine the source to see the programming technics I used for scanning the TMS 9901 directly. You could also use it as a base for a new program that allows examining the CRU functions of the disk controller card for example. In any case, feel free to change the source, but please let me see the results.

PUBLIC DOMAIN, FREEWARE OR WHAT-SOEVER.

This program may be duplicated in any form without notice of the author. You may distribute it via your users group or give it away to your friends. But please pass along the source and this documentation too. If you like the program do not send me $10.00 (although I wouldn't mind) but send me a program of your own that I can distribute via the Dutch users group. Thank you.

THE AUTHORS NAME AND ADDRESS:

CRUTST V3.0 and this documentation were written by: Eric-Paul Rebel Merelstraat 27 1223 NR HILVERSUM The Netherlands Phone: 31-35832929
Don't ring me up when you don't speak Dutch and live

in another continent because the time in Hilversum is different and my English, Spanish and Japanese are BAD!

My apologies for the bad English but I suppose you prefer it over the Dutch version.

END OF ARTICLE

PUZZLE

This months list of words is based around the subject of "CAKES"

```
K G B K B A L C Q M F H A Z G J C D Z K
N R K M J Y M I Y U A P G E D T W X P B
N K E Y U P A A Z L T N B A T U W Q S C
V X G Z N K D N O C E P D H T N C W W A
X X E J U H W B H N U G V E C E I M W T
Q T E I T A C R K L U C N A I S A C B E
L K B R L G I V A E Y B C A S R D U K Y
K S I N Y S N M Y W V E D R J U A A X L
H B U R T G W M Q M H D O E E P C R D S
L T I H R R Y E M Q E L X Y C T J D P O
A A A W O P E G Y V L R C P R I L O A A
F S W E H D R D I R C Y V O N J N E H P
F I F T N B P L W L Q H H O F G S S R I
V X F U T A F A D K J S O E E F F H E X
U O D V V H M Y S O C R Q C S S E I Z Q
Y W Z L J X W D M Q A O Q Y O E N E X S
N Y O R R N V U H C E Q R W C L E N X S
Q V W Q H P H P A O Q P B Z P O A H B Y
A O E A V I H M I F E N H F X O G T C O
P F K Y H O Y X N K S N U E L K S U E T
```

Find these hidden words

HOW TO PLAY

In this puzzle there (20) words somewhere horizontally, vertically, diagonally even backwards

GOOD LUCK !

ANGEL	BIRTHDAY	CHEESE
CHOCOLATE	CHRISTMAS	COFFEE
DEVIL	DUNDEE	FAIRY
GATEAUX	ICEDBUN	MACAROON
MANDEIRA	PAVLOVA	ROCK
SHORTCAKE	SPONGE	SWISSROLL
TEA	WALNUT	

This puzzle was compiled using Ashley Lynn's programe "Word Puzzle" which can be ordered through TIsHUG.

DUMPING DATA INTO MULTIPLAN
By BOB RELYEA

HOW TO USE THE SYLK FILE FORMAT   PART 3

Sorry about not getting this article in last month. I had a great holiday which included 12 days in Tasmania. It is taking a while to get back into the swing of school and of writing articles. Since writing the last article I have found out some good news. The SYLK file format was continued by Microsoft when they developed the spreadsheet software for Microsoft Works, as indicated on page 209 of the manual. There it reads-

"Works can open SYLK files
You can open files saved in SYLK (Symbolic Link) format in Works. You simply open the SYLK file as you would any existing file. SYLK files are denoted by the .SLK filename extension. Many applications, including Microsoft Excel for the Macintosh and Microsoft Multiplan, can save files in the SYLK format."

It also says-

"Multiplan 4.x files
If you want to use a Multiplan 4.x file with Works, save the Multiplan file in spreadsheet in .WKS format also."

As mentioned at the end of part 2, the focus of this part is to show how to set up a string which incorporates all of the SYLK parameters. As you may have noticed in the articles written by Bill Harns he uses T$ to represent the string that is being created. To keep things simple I'll use the same name. The string basically has three parts to it-

1) The introductory part, where you identify the string and put in basic spreadsheet parameters such as the defaults and the spreadsheet size. Each parameter must be joined by the concatenation '&', be enclosed in quotes, and end with a carriage return and a linefeed. To save writing the carriage return and linefeed in each time you are best advised to define a string that contains both, such as,

R$=CHR$(13)&CHR$(10)

A typical opening line would be-

T$="ID;MPCPXB8"&R$&"F;DG2G6"&R$&"B;Y17;X3"&R$

Remember, the MPCPXB8 is just a program identifier and does not even have to be used. The "B;Y17;X3" defines the size of your worksheet and that is optional as well. So, when you get down to it, there is not much that really has to be in the introductory part.

2) The 'meat' of the string, where all the data from

your external program has to be placed, cell by cell. That is, everything in your porgram has to be assigned to a cell in Multiplan. This can be quite a pain if you have to manually place each bit of data into a place on a string. It would be worse than just keyboarding the information into the Multiplan spreadsheet to begin with! The problem is quickly rectified when you realise that a loop can be used to do the repeated operations. The data from the Extended Basic program that I want to dump into Multiplan has three basic bits of information. They are written below together with the 'label' assigned to them in the original program.

    a) a name, SN$(I),
    b) a raw score, M(I),
    c) a standardised mark, Y2(I).

Not all of the information can be placed into the string on a single line number, so you have to build and re-build the T$ string. When the string exceeds 128 characters you have to have it written to disk before continuing. A provision must be placed in your program to accomplish that, and this has been explained in part 2. In addition to the quotes that must surround each record type you must also place quotes around any strings from your external program, such as the SN$(I) above. This is best done by making a little string that does this, such as X$=CHR$(34). Numerical data, such as M(I) and Y2(I) above must converted into a string using the STR function of Extended Basic. What follows are three lines that I used to incorporate the 3 bits of information mentioned above.

```
T$=T$&"C;Y"&STR$(I)&";X1;K"&X$&SN$(I)&X$&R$
T$=T$&"C;Y"&STR$(I)&";X2;K"&STR$(M(I))&R$
T$=T$&"C;Y"&STR$(I)&";X3;K"&STR$(Y2(I))&R$
```

Remember, the 'C' stands for Cell and the 'K' stands for the data that goes into the cell. 'Y' and 'X' stand for row and column, respectively. If 'I' is defined as 1 to N where N is 5, then there will be 5 rows and 3 columns, as the last X is X3. Therefore, the first line would say something like- "place into cell Column 1, Row 1 the name Fred Couples". The second line would say- "place into cell Column 1, Row 2 the raw score, 56". the third line would say- "place into cell Column 1, Row 3 the stardardised mark, 63". So, after this has all been dumped into the SYLK file and you call it up with the Multiplan Spreadsheet, all of the information appears into each cell exactly as you have specified. After going through all three lines with number 1 for I, the loop then proceeds to use a 2 for I and you thereby place all the information into the string that is destined for Rows 1,2,&3 of Column 2 and so on. This must be practiced a bit in order to be mastered!

3) The last part of the string just 'signs off'. You can place some more parameters in it if you like but most of it is unnecessary. The thing that really must be included is the 'E' to signify the end of the SYLK file. A typical closing line would be-

$$T\$=T\$\&"W;N1;A1\ 1"\&R\$\&"E"\&R\$.$$

From left to right this line tells us that there is one window (W;N1) and that when the SYLK file is loaded into Multiplan the highlighted cell is Row 1, Column 1. 'E' means it has all ended and so has this article. Hope you have learned something! Next month I will show the full program that I wrote to take the data generated by the Extended Basic program and dump it into the SYLK file.

END OF ARTICLE

EBAUCHE

By Damon Pillinger

Here is a great demonstration program, draws a fascinating picture pattern on the screen, based on a series of squares. So type it in and give it a try.

```
10 ! *** EBAUCHE ***
20 ! *** BY DAMON ***
30 ! *** PILLINGER ***
40 CALL SCREEN(4)
50 CALL CLEAR
60 FOR T=2 TO 10
70 CALL CHAR(24+(T*8),"")
80 CALL COLOR(T,T,T)
90 NEXT T
100 FOR T=1 TO 10
110 CALL HCHAR(T,T,32+(T*8),
20-(T*2))
120 CALL HCHAR(20-T,T,32+(T*
8),20-(T*2))
130 CALL VCHAR(T,T,32+(T*8),
20-(T*2))
140 CALL VCHAR(T,19-T,32+(T*
8),20-(T*2))
150 NEXT T
160 FOR Y=1 TO 8
170 A(Y)=Y
180 NEXT Y
190 FOR Y=1 TO 8
200 A(Y)=A(Y)+1
210 IF A(Y)<>9 THEN 230
220 A(Y)=1
230 CALL
COLOR(Y+1,2,A(Y)+1)
240 NEXT Y
250 GOTO 190
```

Feed Me

EDITORS COMMENTS

Hello all fellow club members its early Sunday morning I'm typing this article up before I go down to the paste-up at Ryde, I was listining to Radio Japan's world wide news broardcast, the unrest and upset's of other countries makes me realy glad to be here in our country Australia.

Welcome to the new club members and there families.
For anybody wishing to find out a bit more information about programming, Percy Harrison has offered to be named as such a person. Percy has been producing the wonderful articles in the TI magazine for the members who wish to advance there programming skills or just to brush up on the skills they already have, I know myself, that there has been new information that has helped me.

The last club meeting was as busy as any thing, Larry with his system and helping everyone interested with his games and other programs. Ross had the computer operated train set with heaps of little fingers willing to try and play with it. Peter with his truck load of bits and pieces for the other computer hmmm...... !!! what is it .....mmm thats right, IBM. Peter had a basic multimeda system ready to go for just over $850:00, what a deal. Peter is one of the people to see if you are wanting help or ideas to build up your system.

Don't forget the club shop for your sales, we have two very enthusiastic men busting to help our members with their needs so keep the club going spend your money at the shop.

`END OF ARTICLE`

MAIL TO ALL

MAIL TO : ALL
MAIL FROM : GEOFFWA
SENT ON Monday 27/03/95 at 17:07:06

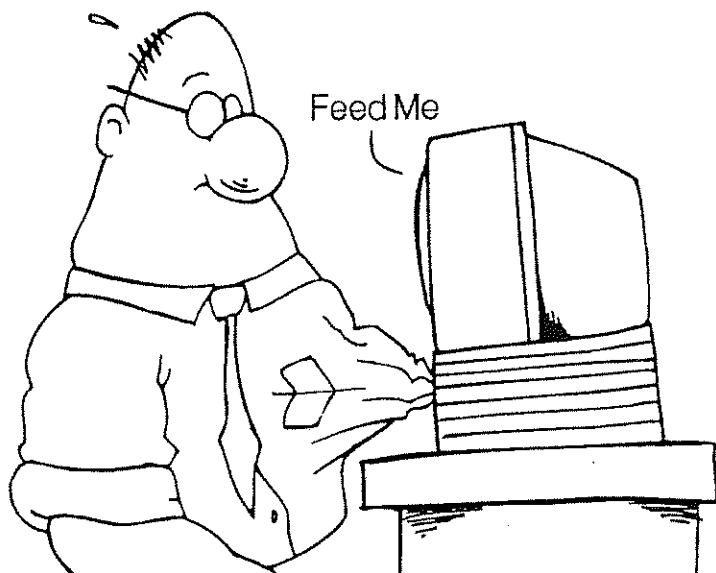RE : THE CONTINUING SAGA OF 'WHAT'S BREWING'

Users,
Further to my last missive on this subject, I received in the mail last week a diskette from "What's Brewing BBS" sysop Tony Laughton. You may recall I had mentioned to him that making the bulletin board a PC - based (not to mention Windows / Excalibur specific) system was limiting its availability to users with that particular hardware / software combination. The contents of the disk was an archived file of a modified version of the Excalibur programme that allowed for (wait for it ...) the slow 2400 bps modems

Tony explains that the system sents a tremendous amount of info down the line, is big on graphics, and some of them are terrific, with the opportunity to view files as they are down - loaded, 2400 bps is just too slow, particularly when dialling interstate. It is unfortunate that he has not yet addressed the 'exclusivity' componant of my message to him, but at least he took note of the comment I made on how slow it was for my use, AND DID SOMETHING ABOUT IT !

To recap, if you are in to home brewing, it is worth a look. if you dial the advertised number and hit <ENTER> a couple of times, you get into a front end that allows you to comment and, if you are using an IBM PC - compatible, down load a copy of Excalibur ... but beware, it takes a long time at 2400 bps and could cost you a bit in STD costs

Regards

Geoff WARNER

ODDS178

GETTING RID OF THOSE UTIL1 AND UTIL2 FILES

If anyone else out there has a problem with all of those "UTIL1" files here is my solution to a couple of them. First some background: I got into this because of a problem with my RamDisk. With a good RamDisk you can put a lot of programs onto the RamDisk that normally would take up several SSSD disks or even SSDD disks. The RamDisk can hold more than a DSDD disk and (to me) is SO much easier to use. TI-WRITER editor loads in 1/10 of the time from a RamDisk than from a normal floppy disk as one example, and the Dragonslayer spelling checker runs in about 1/3 the normal time as it is heavily disk dependent. (In case you haven't guessed, I wouldn't trade mine for anything except possibly a CRAY1 supercomputer.) But, back to the problem. It seems that most of the software writers name there assembly language files "UTIL1" as that is the default name for the TI-WRITER utility files. This is not a problem unless you want to put more than one program on a disk and you can't because they have the same name. I will discuss here the modification for Funnelweb Farms Funlwriter (V3.1) and Paul Charltons FastTerm.

For Funlwriter change the following program lines as I have done. The line 160 merely displays the name of the program and not the file name. Line 240 actually contains the first file name to run. In this case, I have renamed the files from "UTIL1" and "UTIL2" to "SPEL1" and "SPEL2" respectively.

```
160 OP$(0)="SPELLCHECK" ! OPTION #4
240 A$="DSK1.SPEL1" :: K=2 :: GOTO 290 ! OPTION #4
```

This was pretty easy as you can see. I will also put in a plug for Funlwriter as it has some excelent capabilities such as the ability to act as a Editor/Assembler emulator and will run most assembly programs. The only one I have found that it won't run is Demon Attack. Small price to pay to be able to get away from the E/A cart.

For FastTerm, it's not quite so easy but is not impossible. Please read the working notes at the end before attempting this.

1. Load the file FAST-LOAD into an editor, preferably the E/A editor but TI-WRITER will do.

2. In line 6, at TAB 48 is the two HEXIDECIMAL digits that define the disk drive number, TAB 53 is the two Hex digits for the first character (originally 55, I

changed it to 54), TAB 56 is the four Hex digits for the second and third characters (originally 5449, I changed it to 4552), TAB 61 is last change for line 6: It MUST be changed from 7 to 8! This is the Checksum tag; the 7 tells the loader to perform checksum error detection and the 8 tells it not to. As we have altered this line, the checksum is no longer valid and if the 8 is not used, you will get a "DATA ERROR" message when the file is loaded.

3. In line 7, at TAB 6 are the last two Hex digits for the fourth character (originally 4C, I changed it to 4D), TAB 8 is the two Hex digits for the fifth and final character (I did not change this one) and serve a special purpose as when the program is loading, this digit is incremented to load the second file. The last change is TAB 61 changed from 7 to 8 for the reasons stated above.

4. Save the file back to disk and rename the files (I used TERM1 and TERM2) and there you have it. A customized version.

Working Notes:

1. Perform this ONLY on a "working" copy and not your master! It's easy to start over on a working copy if you make a mistake, but, on your only copy; well.....

2. The file MUST be saved as DISPLAY/FIXED 80 or it will not load. If using the E/A editor, when it asks if you want Variable 80 answer no! If using TI-WRITER use the following program to convert the file from DIS/VAR 80 to DIS/FIX 80. Failure to convert the file to DIS/FIX 80 will also cause the dreaded DATA ERROR.

```
100 CALL CLEAR
110 PRINT "READING"
120 DIM A$(25)
130 OPEN #1:"DSKn.filename",DISPLAY ,VARIABLE 80
140 FOR I=1 TO 25
150 LINPUT #1:A$(I)
160 NEXT I
170 CLOSE #1
180 CALL CLEAR
190 PRINT "WRITING"
200 OPEN #1:"DSKn.filename",DISPLAY ,FIXED 80
210 FOR I=1 TO 25
220 PRINT #1:A$(I)
230 NEXT I
240 CLOSE #1
250 CALL CLEAR
260 PRINT "DONE"
```

3. The two files UTIL1 and UTIL2 >MUST< be sequentially named, ie: TERM1 and TERM2, or TERMA and

TERMB, as the loader will load the first program then add 1 to the last character of the file name and perform another load of this filename. The program is broken into two parts because of a file size limitation of the loader.

If any of you are considering purchasing a RamDisk I'll throw in my experience so far. I looked at the Horizon RamDisk and the MYARC 512K card with RamDisk/Print spooler and finally opted for the MYARC for several reasons. The two Horizon cards I used had problems with dropping data and causing lockups. I will give them the benifit of the doubt and admit that both cards were the kits and I didn't assemble them so I can't be sure that there wasn't some error made in assembly or just unlucky glitches pecular to those two cards but I felt that it just wasn't worth taking the chance so I purchased the MYARC 512K system. Unlike the Horizon system, the MYARC does not have the battery backup system but does have a external power supply connection that takes any 9V at 500MA (the ATARI game power packs work great). I initally had a problem with occasionally turning on my system and finding my RamDisk erased but this was not the fault of card but of occasioally heavy surges in my AC line voltage. I fixed that with a large capacitor (20,000mf) accross the output of the power pack and haven't lost a "bit" of data since. (Pun intended!) I have also noted that CorComp has now come out with a RamDisk card but I have not seen one firsthand. There seems to be a division into two camps lately over the two manufacturers, CorComp and Myarc. Randy, in the Rag, is very "anti-Myarc" and "pro-CorComp". I have two complete systems, one is my "home" system and one travels with me as I am on the road a lot.

My home system consists of the Myarc 512K card, TI RS232, Myarc disk controller, and the CorComp Triple Tech card, 2 SSDD drives, Gemini-10X printer, Smith-Corona L1000 LQ printer.

My travel system consists of the CorComp Micro Expansion System (32K, Controller, RS232), 2 DSDD drives.

So: I can say that I have seen both sides of the street. Both of these systems have pluses and minuses.

On the minus side for the Myarc system is some incompatibility with the copy protection of some software such as Companion and Advanced Diagnostics, but on the plus side is customer support, as any questions or correspondence I have had with them I have always gotten a prompt reply.

On the plus side for the CorComp is the software

compatibility with all software I have tried but this is rather heavily (to me) offset by their minus side: customer support. I have written them 5 times and (in desperation) called them 3 times and as yet have not recieved ANY(!!!!!) support from them whatsoever (do they know how to write???) and why is it that "the guy who can answer that question isn't here today and I don't know when he'll be back" (does he even work there???) and they will NOT return long distance calls even if you offer to reverse the charges. For 6 months now I have been trying; too long to keep any customer "satisfied" but who knows, I may hear from them someday...... (BUT I'M NOT HOLDING MY BREATH! Would I spend the $500.00 on CorComp hardware again? NOT unless there customer support is PROVEN(!) to vastly improved (anyone have any pull with them? Randy?)

I hope, as always, that this is of use to someone else besides me. If you have you have any questions or comments please let me know.

Mad Mel

Bags packed and gone again.....

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█EMD OF ARTICLE▓▓▶—
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JUST A ONE LINER (ED)

Q: Why did the little girl tiptoe past the medicine cabinet?
A: She didn't want to wake the sleeping pills.

JUST A ONE LINER (ED)

Boxer (to manager): Do you think I hurt him at all in the last round?
Manager: I dont think so, but keep swing your arms. He might die of pneumonia from the breeze.

IBM

HARD DISK DRIVES

By Cyril Bohlsen

MANY PEOPLE WHO PURCHASE OR ACQUIRE A SECOND HAND HARD DISK DRIVE HAVE TROUBLE DETERMINING HOW THEY SHOULD SET THE DRIVE UP IN THE BIOS TABLE OF THEIR COMPUTER.. JUST KNOWING THE MODEL AND MAKE OF THE DRIVE IS OF LITTLE USE.

LISTED BELOW ARE SOME HARD DISK SETTINGS I HAVE BEEN ABLE TO COLLECT FROM VARIOUS SOURCES.

MAKE	SIZE	CYLINDERS	HEADS	SECTORS
CONNER				
CP2024	21	615	4	17
CP2934	31	411	4	38
CP2044	42	977	5	17
CP2064	64	823	4	38
CP2084	85	548	8	38
CP2088	85	548	8	38
CP2124	121	762	8	39
CP2174	189	327	16	63
CP2254	252	489	16	63
CP3024	21	615	4	17
CP3044	42	977	5	17
CP3000	42	977	5	17
CP30064	84	762	4	39
CP3184	84	832	6	33
CP30084	84	526	8	39
CP3104	104	776	8	33
CP3114	112	832	8	33
CP30104	121	762	8	39
CP30124	126	895	5	55
CP30174	171	332	16	63
CP30204	212	683	16	38
CP30254	252	895	10	55
CP3304	340	659	16	63
CP3364	362	702	16	63
CP30344	343	665	16	63
CP3504	509	987	16	63
CP3544	528	1024	16	63
CP30544	528	1024	16	63

MAKE	SIZE	CYLINDERS	HEADS	SECTORS
SEAGATE				
ST213	10	615	2	17
ST225	21	615	4	17
ST238R	21	615	4	17
ST251	42	820	6	17
ST277R	42	820	6	17
ST325A/X	21	615	4	17
ST351A/X	42	820	6	17
ST1096N	84	906	7	28
ST1100	84	1072	9	17
ST1111E	98	1072	5	36
ST1126A	111	1072	7	29
ST1150R	128	1072	9	26
ST1162N	142	1068	9	29
ST1201A	177	1072	9	36
ST1239N	210	1268	9	36
ST1400A		1475	7	
ST1401N		1100	9	
ST1480A		1474	9	
ST1581N		1476	9	
ST1980N	852	1730	13	74
ST2106E	89	1024	5	34
ST2125N		1544	3	
ST2182E	160	1455	4	54
ST2209N		1544	5	
ST2274A	241	1747	5	54
ST2383A	338	1747	7	54
ST3096A	85	1024	10	17
ST3120A	102	1024	12	17
ST3144A	124	1001	15	17
ST4026	21	615	4	17
ST4038	31	733	5	17
ST4051	42	977	5	17
ST4096	80	1024	9	17
ST4077R	44	1024	5	17
ST4144R	80	1024	9	17

MAKE	SIZE	CYLINDERS	HEADS	SECTORS
MAXTOR				
7120AT	130	936	16	17
I.B.M.				
	1000	2100	16	63
WESTERN DIGITAL				
WD AC2420	425	989	15	56
SAMSUNG				
SHD-3171A1	178	968	8	45
SHD-3172A1	356	968	16	45
SHD-3211A	213	1002	8	52
SHD-3212A	426	1002	16	52

MAKE	SIZE	CYLINDERS	HEADS	SECTORS
MINISCRIBE				
3053	44	1024	5	17
3085	71	1170	7	17
3085T	62	1024	7	17
3130	108	1250	5	34
3180	152	1250	7	34
3425	21	615	4	17
3438	32	615	4	26
3650	42	809	6	17
3675	64	809	6	26
6032	26	1024	3	17
6053	44	1024	5	17
6074	62	1024	7	17
6079	68	1024	5	26
6085	71	1024	8	17
6128	109	1024	8	26
8051	42	981	5	17
8425	21	615	4	17
8438	32	615	4	26
8450	41	771	4	26
8450XT	42	805	4	26
9230	191	1224	9	34
9230T	160	1024	9	34
9380	319	1224	15	34
9380T	267	1024	15	34
9780	676	1661	15	53

IF YOU WISH TO WORK OUT THE CAPACITY OF A HARD DISK, AND KNOW THE NUMBER OF SECTORS, HEADS AND CYLINDERS, THE FOLLOWING FORMULA WILL GIVE THE STORAGE CAPACITY OF THE DRIVE.

ie. SECTORS x HEADS x CYLINDERS x 512(BYTES PER SECTOR) = SIZE OF DRIVE.

SO FOR A "MINISCRIBE 3675" HARD DISK WE WOULD HAVE

SIZE = 809 x 6 x 26 x 512 = 64,616,448 bytes OR ROUGHTLY 64 megabytes.

WHERE TO FROM HERE? Will a standard emerge?

Another In truth, there are far fewer true manufacturers of PCMCIA cards (now referred to as PC Cards) than the number of brands available as many companies have entered the market by simply re-badging product. This raises a few issues, especially as the technology is still in an evolutionary phase. Some cards have greater functionality and compatibility than others but this is not always immediately obvious to resellers or users.

Quality of product, especially the card frames and connectors which have a major bearing on life expectancy of what is a reasonably fragile product, varies between manufacturers significantly (cheap cards are still cheap - by that I mean there is no magic that allows one manufacturer to produce product at half the price of another). Probably the most important aspect however is that of support. There is a definite learning curve with PCMCIA and there is absolutely no guarantee that just → a company supplies cards that they understand the issues. As many of you out at the coalface already know PCMCIA technology is not as simple as just plugging a card in - support is often required with each installation. Suppliers will come and go but the issue of support will always remain.

There are two major solutions on the drawing board. Microsoft is planning to include PC Card plug and play functionality in its next release of Windows (Chicago) due late this year. This is a joint development between card and socket designers System Soft, and Microsoft.

Intel have also announced "QuickSwap", designed for Intel based systems, as their solution to the current compatibility problems. However, the Intel solution does not seem to carry as much favour as the Chicago project, probably because of the widespread use of Windows. Another factor may be that it is CPU dependent - and the PCMCIA industry wants solutions that will address everything from PDA's through to PowerPC. We shall have to wait and see.

JUST NEWS & REVIEWS

It's All In The Cards

The latest technology to hit the streets is the PCMCIA card. It promises almost everything the mobile and desktop computer user could want in a sliver of silicon and plactic the size of a credit card. We look at the options available now.

The Personal Computer Memory Card International Association (PCMCIA) was formed in June 1989 to establish interface standards, primarily for the portable computin industry, to increase the functionalit of systems.

The basic design was based on the 68 pin credit card form factor defined by the JEIDA (Japanese Electronic Industry Development Association) which was used, in 88 pin format, for the development of DRAM cards. Today, almost all the major

JUST NEWS & REVIEWS

manufacturers have incorporated PCMCIA slots into their hardware and it is estimated that 100 million devices using the technology will be sold worldwide by the year 2000.

PCMCIA cards (now simply known as PC Cards) are developed in credit-card sized footprint measuring only 54 mm wide by 85.6 mm deep and up to 14 mm thick (see next paragraph regarding "Types"). This means that functions available internally on desktop PC's can now be easily slotted into (or removed from) an expansion slot smaller than a 3.5 inch floppy drive in notebook or palmtop systems. PCMCIA products are directly coupled to host computer's internal BUS.

To date there have been two major releases of card specifications. Release 1 supported solid state storage such as Flash memory and SRAM (these are known as Type 1.0 card and measure 3.3 mm thick). Release 2.0 supported I/O type products such as modems, LAN attachment, sound, video capture and other devices. I/O cards typically are developed in a 5 mm thick format which allows chips to be

> "installing PC cards should be as easy as inserting a credit card into an ATM "

mounted on both sides of the silicon (whereas Type 1 cards only have chips on 1 side).

A 10 mm thick Type III card was also specified as an extension of Release 2.0. The only products that are currently available in this format are portable hard disks with capacities up to 105 MB. The attraction of the 10.5 mm thickness is not so much chip miniaturisation (though it certainly increases flexibility in terms of chip availability) but more to do with connectors which may be integrated directly into the PC Card, as opposed to using external cable assemblies to provide connections which is the norm today.

The PCMCIA specification is designed to bring compatibility to PCMCIA cards so they should run in any manufacturer's system equipped with a PCMCIA slot. Secondly, per-formance is similar to normal 16 bit ISA cards used in desktops (almost 4 times the performance of parallel port attached peripherals). Thus, not only are PCMCIA cards extremely portable but installing them should almost be as easy as inserting a credit card into an Automatic Teller Machine.

A further benefit is the low power consumption of PC Cards. This allows

the technology to be integrated across platforms including battery powered devices such as PDA's (Personal Digital Assistants). Flexibility is further enhanced with the "hot swapping" facility which allows cards to be swapped in and out of machines without having to power down.

As with any new technology, the delivery of functions has not quite matched expectations. One of the major benefits being touted for PC cards is the ability of cards to be automatically recognised by any system. This "plug and play" facility, implemented via Card and Socket services software, is supposed to be seamless - in other words any PCMCIA based system should be able to recognise any PC Card and allow the card to function without significant user intervention. This is currently not the case, which is not surprising considering the number of
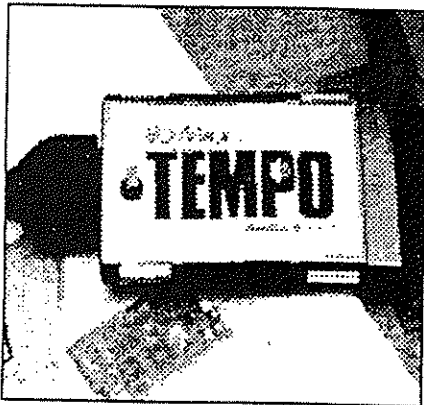
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JUST NEWS & REVIEWS

organisations involved in PCMCIA.

Should this compatibility issue stop people making an investment in PCMCIA technology? In my opinion definitely not. The performance and flexibility benefits of PC Cards far outweigh the downside of the "plug and

play" issue. Even parallel port technology, which has been around for many years, has its own compatibility problems. The performance, flexibility and convenience factor of PC Cards for computer users simply cannot be overlooked. We shall see much more of PCMCIA cards, for sure.

PCMCIA CARD APPLICATIONS: AND THEN THERE WAS . . .

What was new PCMCIA-wise at the recent Comdex exhibition in the US? This massive week-long extravaganza hosted the best from around the world in card technology. We check out the best. Most notable new product would have to be Socket Communication's PageCard. This card operates as a stand alone pager but when inserted into a PC can provide remote access to Windows applications, such as CC Mail, Lotus Notes or Word for Windows, using the paging network.

BANDWIDTH
The sad news is that the bandwidths in the US and Australia are different and significant rework will be required to make the product operate in our environment. Second place goes to Syquest who were demonstrating (a working model I think) a Type 3.0 hard disk which had removable 80 MB platters. Delivery was expected around the end of the first quarter 1994. New Media Corporation released the .WAV Jammer, a 16 bit stereo cards with Microsoft and Soundblaster compatibility which should be available any day now as well as the Bus Toaster SCSI II controller with performance similar to an Adaptec 1542.

I/O Magic were demonstrating a sound card with Yamaha Gold compatible midi functionality as well as an image grabber product. Both Xircom and Socket were demonstrating combination 14.4 data fax modems with LAN capability packaged into a Type 2.0 card. I had a chance to look at the silicon and the packaging of the chips was amazing. These products are due at the end of the first quarter. Austel approvals permitting. There was even an ISDN modem being manufactured out of Europe but don't cross your fingers for a product release in Australia. Several suppliers were offering card bays for desktops with both storage and I/O card compatibility. Someone thinks there is going to be a good aftermarket opportunity for the existing desktop base to move into the world of PCMCIA.

TYPE IV
There were a few Type 4.0 PC Cards. ; 14.4 Data/Fax modem and some hard disk products. The jury is still out on Type 4.0 which is a JEIDA (Japanese Electronics Industry Development Association) initiative available in some Toshiba notebooks. Little of the current PCMCIA literature even makes mention of Type 4.0 slots. In my
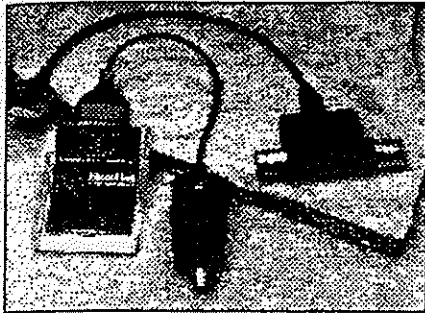
opinion, the major benefit is that the extra thickness of the card allows a wider range of chipsets to be used for multi-function product development. A side benefit is that many connectors can be integrated into the PC Card so that external media modules, such as a DAA or an Ethernet 10BASET socket, are no longer required. This can make a lot of sense from a user perspective as there are less cables to carry around and the security of connection is increased. Again only time will tell whether this type of slot will gain widespread acceptance though Toshiba machines are pretty widespread.

A number of IBM host communications options are available. Both Capstone Technologies and IBM provide 3270 adapters with a direct coax connection. Capstone Technologies has also developed a 5250 emulation card with Twinax connector. The card directly interfaces to IBM's AS/400 PC Support program without need for any additional software.

SCSI controllers are also available now, from established makers like Adaptec and New Media Corporation. SCSI cards usually come bundled with SCSI drivers for compatibility with a wide range of devices; some have plug & play software on board. Performance is quite respectable with sustained data transfer rates of 500 KB/sec with peaks up to 3 MB/sec. This performance is more than adequate for using double spin CD-ROM technology for multi-media applications. The card also supports SCSI daisy chain with

Centronics 50, DB-25 and Mini SCSI connectors.

For applications that require additional serial ports or high speed data communications, Socket Communications has developed a Serial Adapter based on the 16550 UART chip which is capable of data throughput rates of up to 115.8 K/baud. This card also forms the basis for the Global Positioning System (GPS), a joint development between Socket Communications and Trimble Navigation Systems. Panasonic is also expected to develop products in this area.

GLOBAL POSITION
Prime GPS applications opportunities exist in nautical, aeronautical and vehicle tracking environments, where the ability to accurately determine position is critical. In standard form, it is capable of providing positional information with up to 25 metres accuracy as well as velocity and height above sea level information.

ISA OUTTA HERE
Does the pace of technology development ever slow down? 1994 is proving a very interesting year for portable product development. By the end of 1994 PCMCIA will be a mature technology and ISA cards could be a thing of the past, especially if there is significant retrofitting of PCMCIA slots into desktops. You can always guarantee that the general direction will be smaller, faster and for less money. How else can the computer industry keep enticing people to shell out more?

Peter Maurer □

Peter Maurer was one of the pioneers of PCMCIA technology in Australia, and works for Advanced Portable Technologies on 02 906 3800.

Major distributors and Suppliers of PCMCIA cards

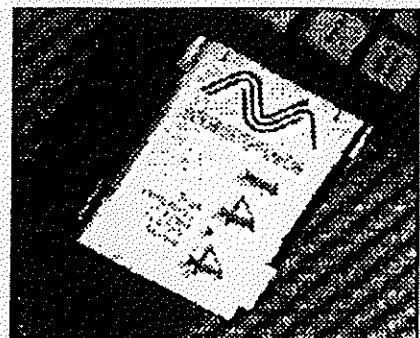**Advanced Portable Technologies: 02 906 3800**

PCMCIA Technologies: 02 954 3411

ACA Pacific: 03 953 9536

Anabelle Bits: 02 313 6155

MediaVision: 02 979 5791

Seagate: 02 02 725 336

Hewlett Packard 131347

REGIONAL GROUP REPORTS

Meeting Summary For SEPTEMBER

Central Coast	09/09/95 Saratoga
Glebe	07/09/95 Glebe
Hunter Valley	10/09 17/09/95
Illawarra	05/09/95 Keiraville
Liverpool	08/09/95 Yagoona West
Sutherland	15/09/95 Jannali

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CENTRAL COAST Regional Group
Regular meetings are normally held on the second Saturday of each month, 6.30pm at the home of John Coulton, 34 Mimosa Ave., Saratoga, (043) 69 3990. Contact Russell Welham (043)92 4000.

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GLEBE Regional Group
Regular meetings are normally on the Thursday evening following the first Saturday of the month, at 8pm at 43 Boyce Street, Glebe. Contact Mike Slattery, (02) 692 8162.

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HUNTER VALLEY Regional Group
The Meetings are usually held on the second or third Sunday of each month at members homes starting at 3pm. Check the location with Geoff Phillips by leaving a message on (049) 428 617. Please note that the previous phone number (049) 428 176 is now used exclusively by the ZZAP BBS which also has TI support. Geoff.

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ILLAWARRA Regional Group
Regular meetings are normally held on the first Tuesday of each month after the TIsHUG Sydney meeting at 7.30pm, at the home of Geoff Trott, 20 Robsons Road, Keiraville. A variety of investigations take place at our meetings, including Word Processing, Spreadsheets and hardware repairs. Contact Geoff Trott on (042) 29 6629 for more information.

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*   LIVERPOOL Regional Group   *
Regular meeting date is the Friday folling the TIshug Sydney meeting at 7.30 pm. Contact Larry Saunders (02) 644-7377 (home). After 10.30 PM or

at work (02)602 3312 Liquorland Liverpool West for more information.

*** ALL WELCOME ***

8th SEPTEMBER 1995 : MY PLACE

13th OCTOBER 1995 : MY PLACE
Bye for now Larry.
Liverpool Regional Co-Ordinator

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SUTHERLAND Regional Group
Regular meetings are held on the third Friday of each month at the home of Peter Young, 51 Jannali Avenue, Jannali at 7.30pm. Peter Young.

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TIsHUG in Sydney
Monthly meetings start promptly at 2pm on the first Saturday of the month. They are held at the MEADOWBANK PRIMARY SCHOOL, on the corner of Thistle Street and Belmore Street, Meadowbank. Cars can enter from Gale Street and park in the school grounds. Regular items include news from the directors, the publications library, the shop, and demonstrations of monthly software.

SEPTEMBER MEETING - 2nd SEPTEMBER

OCTOBER MEETING - 7nd OCTOBER
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The cut-off dates for submitting articles to the Editor for the TND via the BBS or otherwise are:

OCTOBER   17th SEPTEMBER

These dates are all Saturdays and there is no guarantee that they will make the magazine unless they are uploaded by 6:00 pm, at the latest. Longer articles should be to hand well before the above dates to ensure there is time to edit them.

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MORE AUTHOR'S WANTED