

PC-NATGUG NEWS

APRIL 1993

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Information Facts on the Group.

PC-NATGUG is an independent User Group for owners of PC's, TRS80's and their respective generic clones. Membership is granted to all who take out a subscription to the current year's newsletter which is usually published each month - application forms from the Membership Secretary. Membership is open to anyone interested in computers. The Group had its origins among users of Tandy machines and owing to contact with Tandy User groups throughout the world, PC-NATGUG has access to a range of articles covering many aspects of software and hardware. While most current material is aimed at PC users, there is a steady stream of TRS80 material. Any member requiring help or introductions should first contact John Kilpatrick (see list of Club Officials). John keeps information concerning members, their equipment, their interests and expertise. In effect he is the man who knows a man. However, if it seems more appropriate, Members can contact the club helpers listed below without introduction from John. Members wishing to donate or acquire obsolete TRS80 equipment should contact the relevant repository. All PC queries should start with John. Still mainly using TRS80 Model 1/111/4 are Roger Storrs (Treasurer), Nat Nathan, Leighton Davies & David Sampson. (Addresses of last 3 are on the page listing librarians & local clubs) Public domain software libraries are kept in five separate collections: Model I/III, Model IV/III, Model II, C/PM & MSDOS. Names of appropriate librarians are available from the Treasurer and are also published at regular intervals. There is a £1 copying charge per disk or tape. The aims of PC-NATGUG are not only to help you but also for you to help others. Please do make sure John Kilpatrick knows you and your equipment. His main source of information is your membership forms. If you do not fill one out when you renew membership or update your equipment he is in the dark. Details of the groups' accounts and constitution are available from the Treasurer. Please send a S.A.E with your requests. Groups exist in many areas and their Secretaries are invited to forward details to our Editor/Publisher for inclusion in PC-NATGUG News. The back page being reserved for this purpose. Back numbers of PC-NATGUG News, in 6 or 12 month volumes, are available at the price indicated on the application forms. The group has no paid officers or employees, and the issue of PC-NATGUG News depends on contributions from Members, who are also invited to submit responses to questions raised in the previous issues. To allow legible print, contributions must be in ASCII files only, sent direct to the Editor on a STANDARD DOS formatted disk (NOT HIGH DENSITY) with a printed hard copy to help maintain the format you require. Please indicate the word processor, disk format used (DOS, track count, etc.) and list files to be used for publication. If you enclose an addressed label, your disk will be returned soon after the file's publication, PC-NATGUG paying postage. The Editor will accept written or typed articles no longer than 50 words in total. Publishing will depend on legibility and time needed to type the articles up. The views expressed in the editorial and other pages of this magazine do not necessarily reflect the views of the committee.

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P.R.O's NOTES.

I said in my March notes that they would be the last before Swindon but the Editor soon put me right, these will be the last.

I recently received 3 envelopes all bearing variations of my address that would never have got past a human operator but because of the slight differences the computer printed the letter out three times & sent them off to me.

The letters were an offer to try the relational Database ALPHA4 Version 2.1 with a 30 day refund, so I sent off for it, the parcel arrived on a Friday, on the Monday I rang ALPHA Software to tell them I was returning it for a refund, I had spent the whole weekend trying to come to terms with it, it may have been full of 'pull down' menus but there were too many of them for me.

I was very disappointed in it, at best it could only be described as a poor copy of dBase III+'s ASSIST function, you could only create databases the way they wanted them & it was very difficult to persuade the program that you did not want your files indexed by record number as the master index, as for creating labels, NO WAY, if a line was too long it was not cut off short but continued on the next line of the next address when using 2 labels across the page.

I also found it confusing selecting the functions one wanted, a pity, I thought it would be a good program for a colleague who has not used a database before & didn't want to get involved in programing, anyway I got my refund, I never even unsealed the free copy of SUPERSTOR that came with it.

Maybe because I have done a lot of dBase programing I was expecting too much, dBase III+ is several years old & this one was supposed to be brand new, the surprising thing is that it got good reviews in the computer magazines, people are scared of the dBase dot prompt, they must have a screen full of pretty pictures.

There have been a lot of articles in the Magazines lately about MSDOS 6, I don't think I shall be getting it, I have all the extras it has bolted on & I don't want a disk compression function, I found with the last one I tried I could no longer use my favourite Disk manager QDOS 3 & as I can do almost all the things I want to from within it, as I said about windows, I will stay with what I have got, after all if it isn't broke don't fix it.

I was pleased to read the articles from Leon Heller, as original members will know, he & Brian Pain started Natgug & I am often in contact with both of them.

I was very interested in Don Snoad's article on Starwriter, I was given a demo disk by another member & was intrigued by it, then I saw an advert for Starwriter Lite which was only half the price so I rang the advertiser who told me they could not sell me a copy because they had come to an arrangement with PC Today to supply it as their front cover disk.

This of course brings me to my next item. What's in PC Today this month, well of course, Starwriter Lite, unfortunately no user instructions, you have to buy the full version for that, not even any DOC files on the disks.

I loaded it up & started to use it but I am not going to go into it the way Don has, he says it all & I agree with him, I most certainly would NOT say it is the best wordprocessor bar none, I didn't like the amount of screen space that is taken up by all the 'bars' & icons etc, not much left to write on, give me an empty screen except for one line of function keys across the top & a status line along the bottom like PFS Write & I am quite happy.

There are also 10 Utilities on the second disk as well, 4 of them for Windows, I tried one 'delbak' which deletes all your 'BAK' files, it got nearly all the way through my hard disk the computer started beeping & I had to do a cold re- boot, so that needs investigating, another one finds all your hidden files, that's a good one, it showed me that I had a hidden README.EXE file in my Utilities directory & a copy of IO.SYS & MSDOS.SYS in both my Root & Dos directories.

There are 8 short reviews on both Dos & Windows programs & 7 longer ones on programs like Claris Works for the PC, this was only a 'Beta' version so it was incomplete but the general opinion was favorable, Visual Basic 2 the latest version of the Windows development language (out of my league) & another called Power Pak that looks interesting.

Like all the other Mags this month there is the obligatory MSDOS 6 review, but as I said earlier I will leave it alone for the time being, let the enthusiasts find all the problems, there is as usual several pages of hints & tips including some not very complementary comments about QuarkXPress for the PC, the writer thinks it has a long way to go to catch up with the existing PC heavyweights in spite of the fact that it was looked upon with such high regard on the Mac.

I have been able to supply Ron Turnbull with a copy of 'The CUSTOM TRS80 & other Mysteries'. So for now that's enough for this month, see you at Swindon.

John Kilpatrick

FRACTENG

by Jim Tobler

Reprinted from the newsletter of the Canberra Micro-80 User's Group Inc.

Not that many years ago the manual that came with your Japanese motorbike could provide hours of amusement as well as (eventually) explaining how to use it. "If for to be stopping please be on the right pedal the hard foot placing." These days with most of the replacement parts for your computer coming from the Asian area buying a new board can provide the same fun. Below are some excerpts of the fractured English from the manual that comes with a new video board.

" This manual base on the beginner's view. It supposes that user knows nothing about computer basics and has no background of getting start any software or driver. As a curious VGA user, you only have to follow the steps, charts and question/answer's parts. Do as what those information have said. Let alone the terminology that you don't know thoroughly. Regarding those should-be or would-be

technical terms, we'll try our best to describe them as detailed as possible. With these sufficient concepts, you're supposed to operate VGA well with other softwares. One thing for sure is that this user's guide is designed for you. As long as you give your babylike curiosity and then ask for it, you may find and take what you want from it. For the purposes of USER'S FRIENDLINESS, our conversational guidances are as follows:"

A basic outline of the manual follows.

Under "How to Install VGA Card" a little eastern philosophy also gets thrown in.

" Hardware in computer structure defines as those devices visible to user in contract to the invisible ones, so called software. Hardware's function differs from its structure. Printer is served for printing; motherboard is designed for computing, memorizing and logical reasoning; VGA is made for output those colorful graphics. Without spirit, human body cannot do anything meant for life. However without software, those functions and works cannot be done. Same reason applies to either scientific world or human society."

Under "Jumper Setting and Hardware Installation" you are advised that a laugh or two can be expected when you put the board in yourself, and at the end you get a pat on the back.

" Secondly, you need to know the layout of motherboard - the component locator. The detailed graph will be on the appendix for reference. To start your installation, just follow the simple instructions below. Anyway the process of VGA card installation is very easy. it will be more funny and educative when learning through self-installing. Be aware of one thing that the last choice is supposed to let the dealer do for you, you positively can make it by USER'S MANUAL. The simplified procedure of VGA configuring are as follows:"

Procedures then follow.....

" We appreciate your cooperation. You have done a good job. This is a brand new start and you certainly will travel something ever so interesting later. Now you are the master of hardware....."

Other snippets include "After our introduction of leading you to the inside of those drivers and modes, it is quite hard to get confused in dealing with VGA graphics. For this sublime reason, perhaps a little patience and effort are appreciated. Take further curiosity, here we are the wonderful world of VGA representation."

" Here we are. After going through the HARDware and Software Installation, we not only grasp the concept of computer operation, but also get used to VGA Utility and Driver. Hope this manual together with this style of introduction as a self-taught guide will benefit you. We trust your reading experiences will be both pleasant and rewarding. Your understanding and response are our heartfelt concerns. Any question of suggestion is appreciated. We look forward to hearing from you _END-USER_, no matter applauses or critics."

It's the thought that counts. - How can they fail with that caring attitude?

HANDY HINT

by Rayner Barta 103 Garrett Street Maroubra NSW 2035 (02) 314-1023

[Reprinted from "SYDTRUG News", P.O. Box 75, PANANIA NSW 2213, AUSTRALIA, September 1991]

Did you ever wonder as to which Bulletin Board you were logged onto whilst using Telix. Well, here is your solution, two very simple scripts.

Listing 1

```
// GET-BBS.SLT
```

```
////////// Displays the BBS Name instead of "Alt-Z for help"//////////
```

```
main()
{
    str bbsname[16] = "";           // for storage and display
    int a = 0;                     // length counter
    int x1;                        // horiz. position of cursor
    int y1;                        // vert. pos. of cursor

    x1 = getx();                   // store cursor position
    y1 = gety();                   // store cursor position

    substr(_entry_name,0,16,bbsname);
    a=strlen(bbsname);

    if (a<16)
        setchrs(bbsname,a,' ',16-a); // pad with spaces - neatness counts

    // this script is set for the display bar at the top of the screen.
    // If the display bar is at the bottom of the screen then change
    // the second 0 in the following line to 24 and that should work for you.

    pstraxy(bbsname,0,0,78);       // write bbsname over "Alt-Z for help"
    gotoxy(x1,y1);                 // restore cursor position
}
```

This is a simple script for Telix users. It gets the BBS name that you are logged on to and displays it on status bar (cut down to 16 characters) instead of the traditional "Alt-Z for help" message. This is possible because the name of the BBS will remain in the memory until you exit Telix or you log onto another BBS.

Listing 2

```
// ALT-Z.SLT

////////// Redisplays the "Alt-Z for help"//////////

main()

{

str altnam[16] = " Alt-Z for help "; // for storage and display
int a = 0;                          // length counter
int x1;                             // horiz. position of cursor
int y1;                             // vert. pos. of cursor

    x1 = getx();                     // store cursor position
    y1 = gety();                     // store cursor position

// this script is set for the display bar at the top of the screen.
// If the display bar is at the bottom of the screen then change
// the second 0 in the following line to 24 and that should work for you.

    pstraxy(altnam,0,0,78);          // restore "Alt-Z for help"
    gotoxy(x1,y1);                  // restore cursor position
}
```

This simple script returns "Alt-Z for help" into its right and proper place.

Both scripts are set up to place the message onto the status bar, as long as it is set to the top of the screen. If your status bar is on the bottom of the screen, just follow the instructions in each script on how to change it over.

MODEL III/4 HARDWARE CONFLICTS

by Joe Kyle-DiPietropaolo

[From "SYDTRUG News" PO Box 75, PANANIA NSW 2213, AUSTRALIA, July '91 where it was from "Adelaide Micro User News" GPO Box 214, ADELAIDE S.A. 5001 AUSTRALIA Feb '91]

Fairly often I have been asked, "Gosh, why won't my hard disk and hardware clock work together? The hardware vendors say they should 'cause they are addressed differently, but they don't".

Here is the problem:

On the Model 3 and 4, there is a signal line that is used to reverse the data bus on the external I/O bus so that data can be input to the computer. Normally, the data bus only "points out". When a device "realises" that it has been addressed, it can pull this line low to send data to the computer.

There are two basic methods by which the external device can control the PC-

lead. First, a "normal" TTL or LS-TTL output. This is the one that causes the problem. Second, an "Open Collector" output, which is the correct way.

Open collector outputs know how to share. Any device can pull the lead low without conflicting with any other device on the bus. Each may pull the line low, or do *nothing* to the lead.

"Normal" TTL signals, on the other hand, may pull the lead low, as above. The problem is that when a "normal" output is not pulling the lead low, it is pushing the lead high, as opposed to just leaving it alone. Now, when there is more than one device in the system, and one of the devices becomes active, it tries to pull the lead low while the rest try to push it high. The result is "contention" and somebody wins. Who wins is up for grabs. If the right party wins, the whole system may seem to work ... for now. As the temperature of the components change, the system ages, etc., this can change.

If one or more devices in the system are open collector, and some are normal TTL, then some combinations of devices may work and others won't. If only one is TTL and the rest are open collector, the system may seem to work but that TTL device is eventually going to burn out.

A technically competent person armed with the schematic for the device in question should understand the problem if given this whole description. They should then be able to look on the schematic for the device and tell whether or not an open collector was used. If all devices pass this test, then they may all be used together without conflict as long as they are addressed differently.

Now, how to fix the problem: A 7405 open collector hex inverter can be used to buffer or replace the output device used. Note that the 7405 will invert the logic of the signal, so that you must either pick off the signal at a point where it is inverted to begin with, or run the signal through two sections of the 7405 with a 2.2K pull-up resistor on the output of the first section. The pull-up for the final output is already on the Model 3 or 4.

The 7405 is a fourteen pin chip, and may be piggy-backed to any existing fourteen pin chip in the device that uses pins 7 and 14 for ground and power. All leads except pins 7 and 14 are bent 90 degrees so that they point straight out. It is then placed over the "host" chip and pins 7 and 14 are soldered to the corresponding pins on the host chip. Wire wrap wire may be used to connect the 7405 inputs and outputs as necessary. If two sections of the 7405 are to be used (if the inverted sense of the signal is not available), the pull-up resistor may be run from the output of the first section to pin 14 on the chip.

One trace cut should be necessary, to separate the output lead from its existing driver chip.

As they say on TV, "This kind of stuff is best attempted by experienced people taking all the necessary safety precautions." If the above explanation and procedure did not make perfect sense to you, I recommend that you do *NOT* try this yourself. Find a local hardware hacker to help you, or take this explanation and the matter up with your various hardware vendors.

MS-DOS NOVICE NOOK - COMPUTER - A LA CARTE

by Roger GILER

[Reprinted from "SYDTRUG News", PO Box 75, PANANIA NSW 2213, AUSTRALIA, Feb. 1992 where it was reprinted from "Voice of FCUG", newsletter of the Fairfield County Computer Users Group Inc., 14 Wakefield Road, WILTON CT 06897, October 1988]

When I started to get involved with the TRS-80 personal computers, in antediluvian times, I was first puzzled, then amused by the term "Menu". Yet, this word describes very well what it represents: a selection of items that can be ordered from the computer. It is an absolute must for any friendly and well brought up computer.

I have stated often that it is just plain rude for a computer to show nothing more to the user than a single letter prompt. At least the Apple McIntosh shows a smiling diskette as it slowly comes to life, and then ends up with a whole flock of mysterious icons. In all fairness, I must add that it does not take long to learn to use them by "clicking" on them with a mouse.

Normally a menu should be used if we have a hard disk which can contain hundreds of programs with cryptic names. Batch files can help us run the programs -- as long as we remember their names. A menu can be much more verbose and tell us, in plain English, what is available. In most cases, a single keystroke should get us up and running with our application.

We could go out and buy a menu program, get one from a local bulletin board, or even buy one from our Shareware librarian. I prefer for us to be a little more adventurous, spend some time, roll our own, and in the process become a little more cozy with our computer.

Since we can readily use BATch files, all we need to know is which one to use. Let me step back and say that a BATch file is a very short program, which can have any name, up to eight characters long but which must have an extension of .BAT. This is an executable program -- one of the three types that the computer can run. It consists of a series of commands which represent the same instructions that we would normally type into the keyboard.

As an example, I have a file called W.BAT. I use it whenever I want to access my word processor. I just type W and press the enter key. The file contains the following lines. The description on the right is not part of the file and is placed there only to explain what each command does:

C: Use drive C:

CD\WEBSTER Go to the Webster subdirectory

WTHPRO/I Install the thesaurus

CD\WORDPERF Go to Word Perfect subdirectory

WP Run the word processor

As long as I remember that W stands for the word processor, I have no problem. I similarly use L for Lotus 1-2-3, D for a database and many other letters of the alphabet for other utilities.

I could keep a list with the names of all my batch files next to my keyboard but this is rather gauche, and would probably get me drummed out of the Computer Consultants Corps, if anyone found out.

Obviously, the best way to do it is to use a menu on the screen -- nothing more than a tabulation of all the batch files. Would you care to guess the name of the batch file that brings up the menu? It is M.BAT. And the first thing that will appear automatically on my screen would be a list of all the available programs and how to reach them.

Many computer devotees do not know how to get a message onto the screen, so let me review the procedure. We need to make a file using "plain text", without funny codes. Then we use the command TYPE to get it to the screen. Remember? This is the way in which we display our CONFIG.SYS and .BAT files.

We use a procedure here to transfer letters from the keyboard to a file. We could use a word processor output in ASCII, but instead, we will assume that we do not have one. This is done with the COPY command which is part of the DOS, which I know that you have if you use a computer. We will instruct it to take the input from the keyboard, and send it to a file that we must name.

The command is COPY CON MENU <CR>. <CR> means to press the Enter, or Return key. It is the familiar COPY command but we tell it here to send information from the CONsole to a file that WE have chosen to call "menu". The file could have any name as long as it is legal. It must consist of one to 8 characters, followed by an optional period and up to a 3 character extension, for example, GARBAGE.YUK.

After we typed the above, we can start entering the information that we want to appear on the screen:

```
*****
* MY MENU *
*****
* C = COMMUNICATION *
* S = SPREADSHEET *
* W = WORD PROCESSOR *
*****
^Z<CR>
```

This last line needs a little clarification. If we press the F6 function key, we will see ^Z on the screen this is called Control Z, and tells the DOS to end our file. (We could also enter Control Z, instead of F6.) You should see the DOS message "1 file(s) copied". If we now do a DIR<CR>, we will see the files in the current directory, and the last one will have the name that we chose with size and date of creation.

As I said before, to display it enter TYPE MENU<CR>. Your handiwork will be on the screen for all to see.

Be neat and clear the screen first with the CLS<CR> command.

It is obvious that you can modify the above example to suit as long as it is no larger than the display screen. It could be a greeting, or any message that

you choose to convey to the computer operator. It should be centered, or suitably positioned on the screen to make it more aesthetic.

Now we have to write a little program, in the form of a batch file that will show our menu on the display. Let us take the scenario where we have a hard disk called C, and will store all our batch files in the root directory. We will call the batch file to start our masterpiece, M.BAT. Here we go again:

```
COPY CON M.BAT<CR>
```

```
C:<CR>
```

```
CD\<CR>
```

```
CLS<CR>
```

```
TYPE MENU<CR>
```

```
^Z<CR>
```

Translated into words, it says: make a file called M.BAT. This file will take us to the drive C: (it does not matter if we are there already), go to the root directory, clear the screen, and display the file called MENU on the screen. The reason for specifying the drive and the directory is that we may be on another drive after having finished another program.

And there you have it. All you need now is the same technique to create the batch files, in this case C.BAT, S.BAT, and W.BAT. In each batch file you will need to enter the command that you presently use to access the particular programs. As a refinement, you could add M in a line just before the ^Z. I have assumed here that you have set up your PATH command to at least include the root directory -- otherwise the computer would have difficulty finding the M.BAT file.

One of these days, we will take a look at the commercial types of menu programs, but what we have done can be just as helpful. The canned programs allow you to do far more than you want to. The major difference between them and ours is that we have to enter a letter plus the <CR>, while they would require only touching the letter.

PROMPTING FOR A CHANGE

by Rex Wagner

Reprinted from the Adelaide Micro User News - May 1992

Anyone who runs a computer on DOS will hear sooner or later about the tyranny of the infamous C:\> prompt sign. That's the sign you keep coming back to after a tiring day in Edlin or Debug, and it may come to represent nothing but frustration and pain.

There is a way to change the prompt sign. Well all know that it's somewhere in the DOS manual, and we may even be promising ourselves that one day we will do something about improving the prompt. But then we forget which page contains the instructions - and, let's face it, the book ain't always too clear anyway.

Just in case you've lost your manual, here is a summary of the simple instructions required to change your prompt.

The prompt is set in the AUTOEXEC.BAT file. If you've installed your program exactly as the manufacturer intended, you probably will have a line in the file which reads:

Prompt=\$p\$g.

The \$p instructs the computer to display the current directory and subdirectory in the prompt. The \$g tells DOS to use the ">" sign after the directory listing.

Let's start by making the computer more friendly with this replacement line in AUTOEXEC.BAT:

Prompt=\$p What shall we do now? \$g.

There. Isn't that more human?

You can include several characters and functions in the prompt with special metacharacters (characters that represent something else, or what you see is NOT what you get). Here are the prompt commands and their specific actions.

\$\$ Display a dollar sign in the prompt

\$t Display the time

\$d Display the date

\$p Display the current subdirectory

\$v Display the DOS version

\$n Display the current drive

\$g Display >

\$l Display <

\$b Display ! (DOS piping symbol)

\$q Display = (equal sign)

\$h Include a backspace on the prompt. This deletes the prior character.

\$e Include an escape. Used in conjunction with the left square bracket [to summon ANSI graphic codes.

\$_ Include a carriage return and line feed. This allows multi-line prompts

Here's the DOS manual instruction on how to set up the prompt in reverse video and return to the usual video mode for other text. (You're meant to guess how it works or look elsewhere in the book for further instructions that will be none too clear for the first-time user).

Prompt=\$e[7m\$p What shall we do know?\$g\$e[

The next step in touching up the prompt is to introduce colour combinations via the \$e[command. This prompt uses the letter m (case is important - use lower case here) to summon the graphics mode to set a green foreground on a red background:

Prompt=\$e[32;41m

the syntax after the \$e[is the background colour, followed by a semicolon, followed by the letter m. Here are the codes for the colours:

FOREGROUND: 30 Black, 31 Red, 32 Green, 33 Yellow,
34 Blue, 35 Magenta, 36 Cyan, 37 White
BACKGROUND: 40 Black, 41 Red, 42 Green, 43 Yellow,
44 Blue, 45 Magenta, 46 Cyan, 47 White

As well as changing the colours, we have control over the text attributes. Simply put the text attribute before the foreground colour attribute and use a semicolon as a separator with no space either side.

TEXT ATTRIBUTES: 0 All attribute off, 1 Bold on,
 4 Underscore (monochrome only),
 5 Blink on, 7 Reverse video on,
 8 Concealed on

With these commands, the prompt can take on a whole new personality. If you come up with something special for your prompt, perhaps we can ask the Editor to publish it and share your creativity with club members.

ARTICLES NEEDED, PLEASE.

WINDOWS BBS

Edited items from the Bulletin Boards

by Ross Boys and Terry Bibb

Reprinted from the newsletter of the Canberra Micro-80 User's Group Inc.

Subject: WIN 3.1 PRESS RELEASE

* With all the clamouring for info on Windows 3.1 and people requesting information "from the horse's mouth" as opposed to rumour, I am reposting here an official Microsoft Press release on the matter that I posted in AUST_WINDOWS a few months ago.

I am just a humble independent Windows consultant and in no way work for or are related to Microsoft - I am simply passing this on. If you have any queries regarding the following information, its best to ask Microsoft themselves. Remember that this release is a few months old now, so things may have changed. I believe I remember reading a message from Sue (Coleman) suggesting that she may post a new release shortly.

Microsoft Windows Environment Version 3.1 August 1991 Overview

With more than 4 million copies sold since the announcement of version 3.0 in May 1990, the end user community has affirmed its support for the Microsoft(R) Windows(TM) environment. Users have made Windows the best-selling retail software product of all time and the second most popular operating system ever (after MS-DOS). More than 200,000 Windows users have attended Microsoft-sponsored conferences, workshops, shows and 20 third-party events this year. And users have made Windows applications the fastest growing segment of the total software applications market, according to data from Microsoft Publisher Association and other sources.

It is fitting then, that Microsoft should look to users to understand how to advance Windows in its next release, version 3.1. In the year since the announcement of version 3.0, Microsoft has conducted an unprecedented campaign to reach and listen to the feedback and comments of the Windows installed base.

This feedback collection process has taken several forms:

>> A commissioned survey of 11,000 U.S. households revealed Windows usage patterns, satisfaction levels, Favourite and least favourite features as well as data about the hardware configuration of typical Windows users. This data was particularly interesting in that it was a "pure" user pool, not biased towards users who are more likely to register their software, subscribe to a particular magazine, etc.

>> Microsoft "Strike Teams" fanned out to gather data from corporate Windows 3.0 users. Nearly 90 per cent of the suggestions resulting from these meetings have been implemented in Windows 3.1.

>> About two thousand Windows users called Microsoft Product Support Services each day for more information about using Windows. From these call, PSS has developed an extensive knowledge base; a representative from PSS served on the Windows 3.1 design committee. The 10 most commonly asked questions have been addressed in Windows 3.1.

>> An active CompuServe(R) support forum through the auspices of the Windows Presentation Manager Association (WPMA) resulted in extensive suggestions and feedback. User suggestions were the driving force behind the improvements and new features in version 3.1. As an important evolutionary step in what is planned to be a long series of Windows-based operating systems from Microsoft, Windows version 3.1 will offer refinements to version 3.0 that are designed to bring greater ease of use, functionality, and performance to Windows users while maintaining backward compatibility with Windows version 3.0 applications. These refinements fall into the following categories:

- * Improved usability and performance
- * Application and system robustness
- * TrueType™ scalable font technology
- * Improved application integration
- * Extension for new computing platforms

This paper will describe the key added features of Windows version 3.1 in greater detail

IMPROVED USABILITY AND PERFORMANCE

Among the results of the extensive feedback from users of Windows version 3.0 are significant enhancements to the usability of the Windows environment. Dozens of improvements will be immediately noticeable, while hundreds of others work behind the scenes to support the new features. While many of them are minor, taken together, these improvements contribute to a smoother, more responsive user interaction with Windows.

IMPROVED INSTALLATION

The Windows version 3.1 Install program will be able to detect even more hardware and software configurations than its version 3.0 predecessor. The result is an improved ability for Windows to configure itself optimally for the machine on which it is being installed. The Installer program detects a wide variety of

TSRs (terminate and stay resident programs), and hardware devices that are known to cause problems, taking action to notify the user or correct the problem without user involvement.

Windows version 3.1 will be easier for novice users to install with Express Install, and more customisable for advanced users, who can select groups of programs to install. For PC coordinators, Windows version 3.1 installation is improved with the batch install option, and better network setup features for installation in networked environments.

FILE MANAGER IMPROVEMENTS

The Windows version 3.1 File Manager has been completely redesigned for improved usability and performance. The File Manager now supports multiple "panes" for easier browsing. Users can now display the directory tree and a list of files side-by-side in a window. The File Manager also allows the display of more file attributes than before and can even display file and folder names in a choice of fonts. Another significant improvement is the new "quick format" capability, which allows users to format floppy disks in much less time than before.

The File Manager will support an easier, more intuitive "drag and drop" model for manipulating files. For example, to print a file, the user drags the file's icon with the mouse and "drops" it into the Print Manager, which prints the document. Users will also be able to take an icon and drop it on a running application or the application title bar, then the application will automatically open that file.

PROGRAM MANAGER IMPROVEMENTS

Improvements to the Program Manager include "wrappable" icon titles that sit neatly under each icon in multiple lines instead of a single long title that may overlap with other icon titles. Users will also appreciate the new "startup group", which allows them to launch any group of applications automatically when the Windows environment is started.

PRINTING IMPROVEMENTS

The Windows version 3.1 Print Manager now has the ability to resume stalled print jobs automatically, without user intervention. For example, if a printer runs out of paper, the print job will be resumed after the paper tray is restocked. Another printing improvement introduced with Windows version 3.1 is the universal printer driver (UNIDRV). This software offers a single, printer-independent driver for which specific printer drivers can be built rapidly. The universal printer driver makes it easier for printer manufacturers to write or update printer drivers because it encapsulates all the major features of a printer driver in a single piece of software. Vendors simply provide a table of printer-specific parameters for each printer. Instead of using dozens of large "monolithic" printer drivers, the Windows environment will need only a single driver and a small support table for each printer. Nearly 250 printers will be supported in Windows 3.1, with the majority supported through UNIDRV.

BETTER SUPPORT FOR NETWORKS

A number of improvements will make Windows version 3.1 easier to use on a computer that is attached to a network. Network administrators will find that setup is easier under Windows version 3.1, especially for complex system configurations. Network problems are also easier to trace and fix because network errors are displayed with more information regarding the type and source of the problem.

Another significant change is that users can specify "persistent" network connections, meaning that information about a remote disk drive or printer is maintained by the Windows environment after a network session is terminated. Any "disconnected" drives will appear in the File Manager's drive bar as "unavailable". To re-establish connection, users will simply click on the drive's icon.

TrueType SCALABLE FONT TECHNOLOGY

Windows version 3.1 includes the new TrueType(TM) scaleable font technology. TrueType provides "outline" fonts, giving users instant access to fonts in any point size, and allowing high quality output of any monitor or printer supported by Windows itself. TrueType was designed and developed to meet the requirements of type professionals and graphic designers. TrueType offers these benefits:

> Complete integration with the operating system. <

TrueType is an integrated component of Windows version 3.1. For users, this means that there is nothing to buy or install. All the benefits of scaleable font technology are built into the operating environment itself, and existing Windows applications can use them immediately. Four TrueType scaleable font families will ship with all copies of Windows version 3.1:

Arial (alternative to Helvetica)

Times New Roman

Courier and

Symbol

Each major font vendor (with the exception of Adobe) has committed to develop substantial TrueType font libraries for both the Mackintosh(TM) and Windows platforms.

> Cross-Platform Compatibility <

TrueType is also offered on the Apple(R) Mackintosh and TrueType fonts can be ported between Windows and the Mackintosh without conversion. So documents using TrueType fonts may be exchanged between a Windows PC and the Mackintosh without required changes in character set, font metrics or line endings. TrueType is also available in Mackintosh-compatible laser printers, in TrueImage printer, and has been licenced to numerous printer vendors for use in future products.

> Dynamic Font Downloading <

TrueType fonts are automatically converted to bitmap images and downloaded to laser printers so that what the user sees on the screen is the same as the printed page. TrueType uses dynamic downloading, sending only the characters PC-

requested rather than the entire character set, resulting in faster, more efficient printing.

> Open Technology <

In order to make it easy for vendors to support TrueType fonts, each font's "metrics" are made available as public specifications and are available without royalties. A font's metrics provide a complete mathematical description of the font's characteristics, which allows vendors of output devices to render the font exactly as it appears on the screen. Public availability of TrueType font specifications will make it easier and less expensive for vendors to support TrueType fonts on their products.

> Improved Application Integration <

Windows environment version 3.1 provides the most sophisticated platform yet for application integration, making it easier for users to exchange data between documents and for programmers to build these capabilities into Windows applications. Application integration is supported by the following features in version 3.1:

OBJECT LINKING AND EMBEDDING

An important technology for the 1990s, Object Linking and Embedding (OLE) creates an environment in which applications can share information seamlessly. With OLE, all data can be thought of as being a type of "object". A spreadsheet chart, an illustration, a table, and even a paragraph of text are all examples of objects. OLE provides the capability for applications to share these objects easily. Windows environment version 3.1 supports OLE by providing standard libraries, interfaces and protocols that applications will use the exchange data objects. As Windows developers begin implementing OLE capabilities within their programs, users will see a new generation of applications that work together cooperatively. OLE capabilities have already been implemented within new versions of the Windows Write, Paint, and Cardfile accessories, all of which are provided with the Windows version 3.1 product. A user can, for example, create an illustration using the Paint program and "embed" the graphic in a Write document. If the illustration must be updated, the user can click on its icon within the Write document, which automatically launches Paint to allow editing of the drawing. Since the original graphics files is "linked" to the image embedded in the document, any changes made to the one will automatically update the other. This eliminates the need to modify multiple copies of the image or modify the original image and re-import it into the document.

BETTER SUPPORT FOR DYNAMIC DATA EXCHANGE

In the Windows environment, the standard way of sharing data between applications is through a mechanism known as dynamic data exchange (DDE). Object Linking and Embedding (as well as other forms of data exchange) use DDE as their primary means of data exchange. Windows environment version 3.1 provides developers with a new Dynamic Data Exchange Manager Library (DDEML) that offers a higher-level programming model and makes it easier for developers to implement

DDE capabilities in a Windows application.

BETTER SUPPORT FOR DOS APPLICATIONS

A number of changes improve support for existing DOS applications within the Windows environment. In particular, DOS application performance is enhanced when using Windows version 3.1 in conjunction with MS-DOS version 5, since MS-DOS 5 makes significantly more memory available to DOS applications. In addition Windows version 3.1 now supports DOS applications in VGA graphics mode in a window or running in the background.

Also, Windows version 3.1 will include more pre-written Program Information File (PIF files "tell" Windows how to run specific DOS applications) for even greater DOS application support. Finally, disk-paging will allow users to run more DOS applications than they can under Windows version 3.0.

EXTENSIONS FOR NEW COMPUTING PLATFORMS

Windows version 3.1 will allow users to exploit significant new computing platforms such as pen-based computers and multimedia PCs.

WINDOWS FOR PEN COMPUTING

Building on the Windows graphical user interface and coupled with advances in symbol recognition, pens will be the foundation for highly intuitive and "personal" user interfaces. To exploit the potential of pen computing, Microsoft has developed a series of extensions to Windows that include: enhancements to the user interface to allow for pen input; a pen message interpreter allowing existing Windows (and DOS) applications to use the pen; and a modular open handwriting recognition engine. More than 30 hardware vendors will ship Microsoft Windows version 3.1 with extensions for pen-based computing with their systems starting in early 1992.

MULTIMEDIA

Windows version 3.1 will work seamlessly with the Microsoft extension for multimedia computing. These extensions allow users to include new objects such as audio, animation and full-motion video and embed them in existing applications. These features will also enable a whole new class of multimedia documents, such as encyclopedias enhanced with video and audio clips, or catalogues that display animated illustrations. Personal computers integrating Windows and the multimedia extensions to Windows will begin shipping this fall. Windows' extensible architecture makes it possible for multimedia computing to span low-cost systems for home and education and sophisticated multimedia authoring platform for the high end of the market.

An important enabling technology for multimedia computing is the OLE protocol described above. With OLE plus the windows multimedia extensions, a user can embed a multimedia "object" such as a video or audio clip into an existing Windows application, just as he or she would a chart or text file.

LAPTOP SUPPORT

Many vendors of today's popular 286 and 386(TM)-based laptop computers ship Windows version 3.0. Users of laptops will appreciate a feature in Windows PC-

version 3.1 called "mouse blur", which makes it easier to find the cursor on a laptop display. In addition, Windows version 3.1 supports the Advanced Power Management specification, which allows Windows to interact with native power management of a laptop PC for longer battery life.

With version 3.1, vendors of laptops and other small form-factor computers will have the option of licensing a special version of Windows in ROM. This version of Windows 3.1 will be burned into a ROM chip and will execute directly from ROM rather than from a hard disk. A ROM version of Windows opens the doors to other types of computing as well, including the emerging category of palm-top computers.

BETA TESTING AND DEVELOPER SUPPORT

Windows environment version 3.1 is currently in beta testing. The beta program will be one of the largest Microsoft has ever conducted, eventually as many as 10,000 participants. Additionally, Microsoft is conducting technical seminars for Windows developers to discuss the details of the new APIs in Windows version 3.1. A new Software Development Kit (SDK) and Driver Development Kit (DDK) will allow developers to more effectively implement the API features. Microsoft's Hardware Compatibility Program currently includes 350 testers and Microsoft is actively recruiting additional participants to ensure the tightest possible compatibility of Windows with the vast array of hardware and peripherals on the market today.

Developers enthusiasm for Windows version 3.1 is high. Nearly 2,000 Windows developers attended a recent Seattle conference on Windows version 3.1. In addition, a June 1991 survey of the top 70 PC independent software vendors (ISV) found that 100 percent are planning to test for and take advantage of Windows version 3.1.

CONCLUSION

Windows version 3.1 is an important next step in Microsoft's core Windows strategy, an evolutionary strategy that spans 286 laptops to high-end workstations or servers. Today, Windows runs on MS-DOS, the operating system that spawned the PC industry and is currently in use by tens of millions of people. Today's Windows runs the thousands of existing MS-DOS and Windows-based applications. Extended versions of Windows -- for example, for multimedia or pen -- allow users to run all of these applications developed developed with pen or multimedia in mind.

Microsoft will ship a high-end versions of Windows called Windows NT (for "new technology") in 1992. Windows NT will run the same DOS-based and Windows-based applications as Windows 3.1., while also supporting advanced security, multithreading, multiprocessor systems, and RISC chips that promise even higher performance. Microsoft's vision of computing in the 1990s and beyond is that computers will empower individuals and organisations. With its scaleable implementations, the investment of Microsoft and the commitment o third parties, Windows will be the foundation for realising this vision.

PC-NATGUG LIBRARIANS

MSDOS (1 disk catalogue - cheque payable to NATGUG)

Mrs Ariela Taylor 42, Davenham Ave. Northwood, Middlesex, HA6 3HQ Tel 092 74 22773

MODEL IV/III & CP/M (2 disk catalogues - cheque payable to David)

Mr David Sampson 4, The Coots, Stockwood, Bristol, Avon, BS14 8LH Tel 0275 830591

For the relevant disk library catalogue from Ariela or David send your own disk(s) formatted for use on your machine (give librarian details) plus a cheque payable as shown above for £2 plus return postage and a self addressed label.

MODEL I/III

Mr Leighton Davies

Tel. 0656 860398

Glanmor, Brynna Road, Pencoed, Bridgend, Mid Glamorgan, CR35 6PD

The Model I library list is a hardcopy printout available at a cost of £2 from the Treasurer (address on the front cover).

MODEL II (No Catalogue - telephone for details of vast range)

Rev Leslie Goulden 83 Victoria Grove E.Cowes ISLE of WIGHT PO32 6JJ Tel 0983 296857

Program disks are only available from librarians. Send one of your own disks formatted for use on your machine (give librarian details) for each library disk of which you want a copy plus a cheque for the copying charge of £1 per disk plus return postage and a self addressed label.

The only exception to this should you prefer, is David Sampson, who is willing to supply disks for an extra £1 and mailers for 50p.

If in doubt please talk to the relevant librarian or the Treasurer.

The Model I library contains programs which will run on Model III. Likewise the Model IV library also has relevance to model III.

LOCAL CLUB NEWS

BOURNEMOUTH. Topic Computer Club

Maurice Mansell 0929-553959

MS-DOS/Tandy. 1st & 3rd Wed Kinson Community Centre 7.30pm

CHELMSFORD. 1st Wed. 7.30pm

Richard Creak 0245 223725

Woodcote, 59d Little Baddow Road, Danbury, Chelmsford CM3 4NT

CRAWLEY, SUSSEX

John Bennett 0293 882933

7pm Third Wed. (Phone to check) Room T11, Technical College

GTR. MANCHESTER.

Peter Mooney 061 789 4454

Last Wed each month 8pm Barton Aeroclub, Barton Airport

LONDON, North & West.

Richard Marks 071-226 6109

1st Sun 10.30 to 1.30 Barnet General Hospital

LONDON, East, 50 Gardner Close, Eastern Avenue E11 2HN Nat Nathan 081 989 6297

MILTON KEYNES Every Tues 7.30pm to 9.30pm Woughton Campus Brain Pain 0908 564271

SCOTLAND, Edinburgh. Dick Mackie, Chairman SPeCS. 031 447 6651

2nd Thur. 7.30pm Cluny Church Centre, Cluny Ave. Morningside

SUDBURY, SUFFOLK 2nd Wed 1 Tenter Piece, Lavenham John Kilpatrick 0787 247835

WEST MIDLANDS Every Wed. 40 Whoberley, Coventry CV5 8EP Fred Challenor 0203 78180

To get your club/group mentioned above, please send full details to the Editor (address on the front cover).

MODIFICATIONS TO THE MODEL 4P BOOT ROM

by Garry Howarth

Reprinted from Bits & Bytes - September 1991

Newsletter of the TRS-80 System 80 Computer Users Group

At my place of employment I have ready access to a number of eeprom programmers and when I am not slaving over a hot soldering iron earning BIG \$\$\$ for the boss or Hawk/Keating/Kerin (The 3 Stooges), I get to have hours of joy experimenting with these fun little devices. One of these experiments has been modifying the Boot Rom on my beloved 4P.

Anyone who owns an XLR8er card knows that you cannot load the MODELB/III file. The reason is that when you press the reset button the 64180 is set to maximum Memory and I/O wait states and maximum Refresh which slows the computer down to a crawl and fouls up the timing loops for floppy driver. All the MODELB/III file does is to speed up the processor and hopefully make the loading of the Rom Image more reliable.

Why not let the Rom speed up the processor? No problem. But let's go one step further. If you own a hard drive, why not load the Rom Image of the hard drive?

No more contortions when trying to make a Newdos Boot disk and how about Arranger or other self booting programs?

Armed with a copy of adam Rubin's disassembly of the Boot Rom I proceeded to butcher the Rom and the following code is the end result. Adam has done a great job of disassembling the Boot Rom and anyone who owns a 4P should get hold of a copy. -CN80 FILE CABINET M4UTL14-

I won't go into all the how, when, where and whys of pulling the machine apart, because if you don't know then you should not be attempting this job. In other words I will not be held responsible if your pride and joy blows up in your face! PLEASE make sure your H/D has been backed up.

Do I still have an audience? OK, having dismantled your little toy, you will have to remove the eeprom. My computer has a 2732 with pins 18 and 21 bent out, I guess that Tandy ran out of proms. Hopefully yours will be the same. The hardest part of this exercise is to find someone with an eeprom programmer. Someone in the club must have access to one!!

Having loaded the eeprom into the programmer, store the original somewhere safe. Better still make a copy (Did someone say COPYRIGHT? If you don't tell them I PC-

won't either) and store the two of them somewhere safe. You may need them.

Have you made mods to the program, blasted the new eprom and reassembled the computer? OK, it's now time to make a few tests. Don't connect the H/D just yet (play it SAFE). Insert a BACKUP of your working disk into drive 0 and press RESET F3 and with a bit of luck the Rom Image should load without the use of MODEL8/III.

Try copying a few programs to a blank disk. If you have any trouble you may have to alter System option BJ. Play around, have fun. Try booting with the F1 key -- you should still get the 'H/D not available' message. Try all the other Boot options and when you are satisfied that all is well, switch off and reconnect the H/D.

Now it's time for the BIG test -drum roll please-. Switch on the H/D and then the computer. If you have made the mods to BOOT/SYS and SYS0/SYS that are listed in TMQ Vol IV.iii or BNB 100 then the computer should boot off the H/D. Copy MODEL8/III onto the H/D drive 0, load your Model III system disk in floppy drive 0 and press RESET F3. With any luck the Rom Image will load in about two or three seconds. Press RESET-RIGHT SHIFT and the Rom Image should load from your floppy. Play around, try all the various Boot options again. If you are still all smiles then crack a can of XXXX and give yourself a pat on the back. A job well done.

If you have not applied the mods from TMQ IV.iii or BNB 100 then you may have to reformat the H/D so that drive 0 starts on Track 0, Head 0 only, and is no more than 203 tracks.

NOTE:- 1) If drive 0 = 203 Cylinders then the Dir Track number listed in BOOT/SYS will be 65H 101D. Logical Track number = Physical Track Number. If the number of cylinders is greater than 203 then the Dir Track number will be half the physical number. E.g. If drive 0 = 406 Cylinders then the DBLBIT will be set and the Dir Track number listed in BOOT/SYS will still be 65H 101D, but the Logical Track number will be half that of the Physical Track number. i.e. The Directory will not be on Physical Track 101, but on track 202. I use RSHARDx from MISOSYS, other H/D drivers may be different.

2) The loader can handle double sided drives so you may be able to use two heads providing you alter the sect/gran and sect/cyl values. I have not tried this, so I cannot guarantee that it will work.

SPEED UP THE XLR8er to M=2,I=1,R=80

This routine zeros the new buffer and will allow loading of the MODEL8/III file

from floppy WITHOUT first loading MODELB/III

NOTE:- This is the MAXIMUM speed that ND80/86/90 disk I/O will work at.
YOU HAVE BEEN WARNED!! (The voice of experience)

```

0001 0000
0003 0000
0005 C3A00F      JP 0FA0H
0FA0 0600      LD B,00H      ;Set memory
0FA2 0E32      LD C,32H      ;Wait States
0FA4 3EB0      LD A,80H      ; to 2
0FA6 ED79      OUT (C),A
0FAB 0E36      LD C,36H      ;Set Refresh
0FAA 3EC3      LD A,C3H      ; to 80 cycles
0FAC ED79      OUT (C),A      ;3 cycles duration
0FAE 210041     LD HL,4100H    ;Load HL with the start of the buffer
0FB1 0604      LD B,04H      ;Number of bytes to clear
0FB3 3600      LD (HL),00H    ;Zero
0FB5 23        INC HL        ; new
0FB6 10FB      DJNZ 0FB3H     ; buffer
0FB8 C33E00     JP 003EH      ;Continue with BOOT

```

```

BUFFER      4100H - 01H = Floppy 02H = Hard drive
- Drive type 4101H - 06H = Floppy 04H = Hard drive
- Sect/Gran 4102H - 12H = Floppy 20H = Hard drive
- Sect/Cyl  4103H - 01H = RIGHT SHIFT pressed, force load from floppy

```

The following mods will load the MODEL%/III file from the hard drive. The program will first check to see if the hard drive is connected and if so it will load the ROM IMAGE from the hard drive. If the hard drive is not connected, the ROM IMAGE will be loaded from floppy Drive 0.

If the RIGHT SHIFT key is pressed, the Hard Drive test will be by-passed and the ROM IMAGE will be loaded from the floppy drive.

The 'LOGICAL DRIVE' where the MODEL%/III file resides must start on Track 0, Head 0, and be no more than 203 tracks -- i.e. DBLBIT must not be set.

NOTE:- These mods will destroy the RS232 BOOT. "WHO CARES?"

```

0102 01FF7F     LD BC,7FFFH    ;Number of times to scan the keyboard
0105 F7         RST 30H        ;Do it
0106 F5         PUSH AF        ;Save the result

```

0107 3A5940	LD A,(4059H)	;Get value stored by KDB scan
010A FE86	CP 86H	; is it F1?
010C 2005	JR NZ,0113H	;No
010E CDC001	CALL 01C0H	;Yes - then boot from H/D
0111 181D	JR 0130H	;Returns only if there is an error
0113 3E01	LD A,01H	;Restore Floppy
0115 0604	LD B,04H	; drive 0
0117 CF	RST 08H	;Do it
0118 2807	JR Z,0121H	;No errors then jump
011A 326740	LD (4067H),A	;Store error code
011D FE06	CP 06H	;Was the error "Floppy not available"?
011F 2805	JR Z,0126H	;Yes - then jump
0121 0632	LD B,32H	;Restore all
0123 3E01	LD A,01H	; other Floppy drives
0125 CF	RST 08H	;Do it
0126 F1	POP AF	;Get KBD scan
0127 2845	JR Z,016EH	;If no keys pressed then try everything
0129 FEB7	CP 87H	;Is it F2?
012B 2008	JR NZ,0135	;No
012D CDCA01	CALL 01CAH	;Yes - then boot from Floppy. Returns on error
0130 B7	OR A	;H/D or Floppy error in A
0131 2804	JR Z,0137H	;If error = 0 then MOD 3 disk
0133 181C	JR 0151H	;Fatal error. Display message and halt
0135 FE8B	CP 8BH	;Is it F3?
0137 283C	JR Z,0175H	;Yes - then jump
0139 FE80	CP 80H	;Is it V?
014C CA6301	JP Z,0163H	;If RIGHT SHIFT pressed then jump
0163 3E01	LD A,01H	;Set 'LOAD FROM FLOPPY FLAG'
0165 320341	LD (4013H),A	; and force load
0168 180B	JR 0175H	; from floppy
0191 CD180C	CALL 0C18H	;Jump to new routine. Checks for SHIFT key
		; and loads buffer with correct values for
		; H/D or Floppy
0A9F CD3E0C	CALL 0C3EH	;Jump to new routine. Gets correct Sect/Gran
		; value from buffer.
0B93 CD460C	CALL 0C46H	;Jump to new routine. Gets correct Sect/Cyl
		; value from buffer
0C0C 210043	LD HL,4300H	;Address of sector buffer
0C0F 060C	LD B,0CH	;Function - read sector
0C11 3A0041	LD A,(4100H)	;Get drive type from buffer
		; 1 = Floppy 2 = H/D
0C14 1600	LD D,00H	;Zero D Reg. DE = Track number. If D <> 0
		; then wrong track will be read.

0C17 C9	RET	
0C18 3A0341	LD A,(4103H)	;Was RIGHT SHIFT
0C1B B7	OR A	; key pressed?
0C1C 2012	JR NZ,0C30H	;YES - then jump and force load from Floppy
0C1E 210241	LD HL,4102H	;Load buffer with correct values for H/D
0C21 3620	LD (HL),20H	;32 Sect/Cyl
0C23 2B	DEC HL	
0C24 3604	LD (HL),04H	;4 Sect/Gran
0C26 2B	DEC HL	
0C27 3602	LD (HL),02H	;Drive type = H/D
0C29 7E	LD A,(HL)	;Initiate and restore
0C2A 0601	LD B,01H	;H/D
0C2C CF	RST 0BH	;Do it
0C2D CA780A	JP Z,0A78H	;If H/D connected then load Rom Image from H/D
0C30 210241	LD HL,4102H	;No - then load buffer with values from Floppy
0C33 3612	LD (HL),12H	;18 Sect/Cyl
0C35 2B	DEC HL	
0C36 3606	LD (HL),06H	;6 Sect/Gran
0C3B 2B	DEC HL	
0C39 3601	LD (HL),01H	;Drive type = Floppy
0C3B C3720A	JP 0A72H	;Load Rom Image from Floppy
0C3E 0D	DEC C	
0C3F F5	PUSH AF	
0C40 3A0141	LD A,(4101H)	;Get Sect/Gran value
0C43 47	LD B,A	; from buffer
0C44 F1	POP AF	
0C45 C9	RET	
0C46 35	DEC (HL)	
0C47 3A0241	LD A,(4102H)	;Get Sect/Cyl value
0C4A 47	LD B,A	; from buffer
0C4B C9	RET	

PROBLEMS:-

- 1) The occasional SEEK ERROR
- 2) The occasional jump into CASSETTE BASIC

My machine has ALWAYS suffered from the above problems, so I doubt that the mods to the ROM have changed anything.

Apart from the 2 problems mentioned, these mods SEEM to work well on my computer.

Finally, many many many many thanks must go to Adam Rubin for his EXCELLENT disassembly of the Boot Rom.

WHAT IS MEANT BY THE TERM "-----" FOR COMPUTERS - Part 3

by Alf West

Reprinted from Bits & Bytes - March 1992

Newsletter of the TRS-80 System 80 Computer Users Group

What is meant by the term "GRANS"

Each track on a disk is divided into Sectors for the purposes of DOS, each sector containing 256 bytes of information. Now when a file is extended, the DOS has to allocate some new disk space for that file and keep track of that as regards the directory. Perhaps it could extend a file one sector at a time but that gets fairly complex in "housekeeping, so in the case of Newdos/80, if the space allocated to a file becomes full due to extensions to the program, it extends the space allocated to the file by 5 Sectors. GRAN is the name given for the smallest unit of disk storage that is allocatable to a file and in the case of Newdos/80 is a unit of 5 Sectors. Conversely, Newdos/80 will not reduce the disk space allocated to a file until 1 GRAN or roughly 1280 bytes are chopped out of the program. If a file is X GRANS, multiply X by 5 to get the number of Sectors allocate to the file.

Bear in mind, particularly when using SUPERZAP, that the program may not fully use all of the sectors in the last GRAN, but the DOS knows where the program finishes by an EOF (End OF File) marker.

(See also the comments on SPG below)

What is meant by the term "PDRIVE"

When Tandy first developed TRSDOS, they could not imagine that anyone would put different drives on their standard machine (or even want to). But naturally, the hackers and some companies could see the advantages of doublers, double sided drives and 80 track drives but TRSDOS originally made no provision for what Tandy considered were non-standard items. So when APPARAT developed Newdos, they introduced the concept of PDRIVE. Why? If you had installed a doubler on your old Model 1, it would be useless to give your mate who had no doubler, a copy of a double density disk as he could not possibly read it. Similarly, if you have 80-track drives but our mate has only 40-track drives there is no point in giving him a copy of an 80-track disk.

The details of the PDRIVE command are given on Pages 2-33 to 2-39 of the Newdos Manual and several articles have appeared in Bits & Bytes as listed in the table at the end of this article.

Newdos has a table with 10 lines and you can see this table by entering PDRIVE:0. Each line shows the parameters for a particular hardware (drive & doubler) configuration. Although you won't have 10 drives (excluding Hard drives the drive you have should on the top line preceded by a "*"). You tell the DOS how many drives you have by setting SYSTEM option "AL".

You will naturally set the parameters on the top lines to those for your own equipment - see the manual and the above articles. It is usual to set the parameters of the other lines not preceded by a "*" to the values appropriate to other common configurations, including that of our mate (we'll assume for the purposes of a later illustration that his configuration is in line 7).

NOTE: When you make changes to the parameters in the PDRIVE table, after you press ENTER, the table again appears on the Screen with the new values. BUT if the changes you make are such that one parameter is incompatible with another, the word "ERROR" will appear on the right hand side of that line. It is most important that you correct the error by changing the appropriate parameter BEFORE doing anything else with the disk, and get an ERROR free table, otherwise the disk may become unusable without resort to SUPERZAP. Also note that in making a change to a line in the table, you do not have to repeat the whole line. Say you changed drive 1 from a 40T to an 80T drive but everything else remained the same, you could simply enter:

PDRIVE,0,1,TC=80,A

.....and the table appears with that change.

Because of the detailed information given in the Manual and the articles, I will only briefly deal with the PDRIVE parameters.

TI. This is the interface parameter with alternatives "A" to "E" and "A" is the most usual. This may be supplemented by a flag letter given in the Manual. The most common are "K" or "L". So for a Model 1 fitted with a doubler you may have TI=AK, and for an 80T drive to read 40T disks, you may have TI=AL.

TD. This is the parameter for the size and type of Drive with alternatives "A" through to "H", depending upon whether it is SS or DS, 5 inch or 8 inch (Model 2).

(Newdos 86/90 has another TI option of TI=N indicating that the disk is not a Newdos 86/90 disk.)

TC. This is the Track Count parameter and the info at the bottom of Page 2-36 of the Manual is self-explanatory.

SPT. This is the Sectors Per Track - see the Manual comments about double sided drives. In the case of later editions of TRSDOS and LDOS, they refer to cylinders so look at the relevant manual.

TSR. This relates to the Track Stepping Rate for the drive and may have a value of 0 to 3. The drive stepping motor will attempt to adhere to the instruction it gets from DOS, via this parameter, but in some cases it just cannot do it. For example, it is useless to set TSR less than 3 if you have the older 35T Tandy drives -- they just cannot cope. Some members skite that

their drives are so good that they use TSR=0. Maybe so, and it certainly gives quicker disk access. But in my case if I use a value of 0, my drives will do it, but I can "feel" them struggling. Being a conservative fuddy duddy and also because I use a lot of data files where I don't want to miss out on any information, I, myself, never go below a value of 1 -- remember each descending number halves the time for the head to step a track.

GPL. This specifies the Grans or Granules Per Lump. So what is a Lump. This was the term introduced by Newdos for "housekeeping" purposes for the files and the Directory and so as to keep the Directory format the same irrespective of whether a doubler (or 8 inch disks) are used. GPL may have a value from 2 to 8, 2 being the normal for single density and 40T drives. As your capacity increases to 80T DS drive with a doubler, the value should increase so that the DOS can include all the necessary info in the GAT sector of the Directory. GPL=6 is mandatory for Newdos/80 to read a TRSDOS 40T double density disk.

DDSL The number given here is the lump where the disk directory starts. Ideally the Directory should be at the centre of the disk because the DOS is always referring to it to find out where the required file is on the disk and other information. Thus the stepper motor does not have to move the head so much after loading a file as it would if a directory were placed at the beginning or the end of the disk. A value of 17 was standard for the original 35T drives without a doubler but for an 80T DS drive with a doubler a value of 35 is suggested. The value is not critical (if it is stored in the Boot Sector of a disk, but a sensible value improves overall access time.

DDGA This is the Disk Directory granule Allocation -- the disk space allowed for the directory and may be any value from 2 to 6. Sometimes you may find, particularly if you have quite a lot of little programs on the disk, that when saving another one, although the disk is far from full, you have reached the embarrassing position of having run out of directory space on that disk. You'll have to save that last program onto another disk -- altering the DDGA number will do no good at all. The position of the Directory and its disk space were fixed according to the values of the DDSL and DDGA at the time when the disk was originally formatted, and no subsequent alteration to the values of DDSL or DDGA in the PDRIVE table is going to alter the Directory of that disk. You can either treat the disk as if it were full and forget about the wasted disk space for programs or alternatively make a copy onto a new disk in another drive where the PDRIVE parameters are the same as the original except that the value for DDGA is increased. Then continue using this copy and forget about the original.

SP6. This is Sectors Per Granule and is NOT a parameter which can be varied in Newdos/80 where it has a value of 5 as previously advised in describing the term "GRAN". However, it can be varied under Newdos 86/90 and was introduced by W. Sands to allow his DOS to format disks compatible with LDOS, Multidos etc. Also it can reduce wastage when working with a number of small files. BUT if a value other than 5 is used, Newdos/80 cannot read the disk [All the more reason that you should be using Newdos90 -- Ed]

Having said all this, how can this help you in giving a copy of your program to your mate who has a different set-up (we are going to assume it as per line 7 on the PDRIVE table)? Now in Newdos 80/86/90 there is a parameter under the COPY command of "DPDN" (Destination PDrive Number) so to make a full disk copy for your mate, put the source disk in one of your drives (x) and a new disk in another (y) and enter the command:

COPY,x,y,date,FMT,DPDN=7

Even though you did not have a drive 7, it is telling the DOS to copy the disk in the format of the parameters in line 7 of the Table.

There is also a COPY command parameter of SPDN (Source PDrive Number). So conversely if you get a disk from your mate you would enter:

COPY,y,x,date,FMT,SPDN=7

DPDN and SPDN are not mutually exclusive -- they can be used together in the same command -- so it is possible with Newdos to make a copy in any format you wish from any other format, neither of which may be the same as your set-up. BUT of course, within the limits of your hardware. By that I mean that you cannot make an 80-track copy if you only have 40-track drives.

Other DOS's have a PDRIVE table of sorts which they use, but their parameters cannot be changed. The fact that you can change them on Newdos, is one of the features which makes it superior to the other DOS's -- and it is so easy to use when you get the hang of it, as you see by the above COPY commands.

Even so, some members seem to have had problems with PDRIVE (perhaps there are too many pages in the Manual to read!) Anyway, to help such people, W. Sands designed the ADFD (Automatic Disk Format Determination) routine in Newdos 86/90 and this will read almost any disk automatically, irrespective of the PDRIVE table settings. Nevertheless you should have an understanding of PDRIVE if you wish to deal with disks for or from a set-up different to your own.

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A review of selected FORTH compilers

Peter J Knaggs

March 16, 1993

When I saw Chris Currie's article on "*Public-Domain Programming Languages for Ms-Dos*" in the February issue of NATGUG (I still refuse to call it PC-NATGUG) it prompted me into writing this article, which I should have written to go along with my "*Introduction to FORTH*" articles. Between writing those articles and this, I have managed to change jobs, now working in the new University of Paisley, Scotland. Thus the move, and settling in here meant that such things are rather low on the priority list. Truth be told I simply forgot about it.

So first, lets look at the compilers available for the TRS-80 range:

HartFORTH:

HartFORTH is a FORTH'79 compiler from Roy Soltoff's MISOSYS company, available for the models one, three, and four. This is a full development system operating under L-Dos (or Ls-Dos), developed by Andrew Graham (from Cheshire, England). It uses a rather odd virtual memory system, that I found difficult to get to grips with.

Initially, I found this to be a fairly good development system, providing access to DOS files, with floating point maths and graphics libraries. Unfortunately there is no code-stripper provided, nor is the source available for meta-compilation. As a result of this it is impossible to generate your own stand alone applications. For the most part this does not matter, as the interactive FORTH compiler is a full operational environment in its own right.

I also find it difficult to get to grips with the FORTH'79 standard. Although the first FORTH system I ever used was a '79 standard system, I much prefer the '83 standard. I am now beginning to find the '83 standard systems somewhat cumbersome since I became involved in developing the new ANSI standard.

Overall I found this to be a good system, except that I don't like the '79 standard that it implements. There is also a major problem with the lack of the code stripper. Although it is not a necessity, the ability of producing stand alone /CMD files is a *very* usefull one. However the system does provide another *very* usefull ability, that of being able to invoke SVC routines, allowing you to use all the facilities provided by the DOS, including functions such as file access etc.

For those of you who don't know, Roy is currently offering this product at a very cheap price (to clear out stock). Roy's address is: MISOSYS, Inc., P.O. Box 239, Sterling, VA 22170-0239 (Tel: 0101-703-450-4181).

MMSFORTH:

Dick and Jill Miller are the people behind Miller Microcomputer Services. They developed their FORTH system, in the early days of the Tandy. Indeed MMSFORTH was available some time before the first of the standards. In 1980 the compiler was updated to be FORTH'79 compliant.

Dick also claims to be the one who thought up that obscure name given to the new Apparat Disk Operating System (NEWDOS). The Millers where one of the β -test sites for this system. MMS developed the hard disk interface that was later to become the Apparat hard disk interface. This was first developed using MMSFORTH and then rewriting it into assembler!

The MMSFORTH system is available for models one, three, and four. After updating the software to version 2.4 the Millers announced that due to lack of sails they will no longer be supporting the Tandy version of the software, however, they are still support-

ing the Ms-Dos version. They still have a model four (or two) in the office, and will be quite willing to sell you a Tandy MMSFORTH, probably for very little considering they no longer support it.

It is, in fact, what the original FORTH was designed to be. It is a self booting program, taking over control of the whole machine. It comes complete, with its own disk handling software, indeed it is a full Operating System. Thus this system provides a total operating environment where MMSFORTH, and thus you the programmer, is in complete and total control of the hardware from bootup to powerdown. All in all, I think this is probably the best implementation of a FORTH'79 system that I have come across. Although you must also remember that it was also the first FORTH compiler I ever used!

The only problem with this, is that having developed your application, you can only distribute it as a self-booting application. However, MMS do have a code stripper program, that will take the self-booting disk and generate a /CMD file from it for use as a stand alone application under your favorite TRS-DOS compatible operating system (Ie., all except Ls-Dos).

The Millers are very active in the Boston chapter of the FORTH Interest Group, and are sponsors to the Rochester FORTH Conference, held each year at the University of Rochester, New York. Indeed, I stopped off with them four a couple of days, on my way to this conference, back in 1990. The Millers have also brought Russian academics to this conference.

Dick can be contacted at dmiller@im.lcs.mit.edu, or your can write to Miller Microcomputer Services, 61 Lake Shore Road, Natick, MA 01760-2099.

eFORTH:

This is a shareware FORTH system written by Dr. Ting. It is a very basic FORTH system providing only the kernel of a complete implementation. It is sufficiently complete for use in embedded systems, but currently little else. Dr. Ting intended it to be a fully

portable implementation of ANSI Standard FORTH kernel. As such this system works well.

Currently there is no eFORTH implementation for the Tandy. However, there is a Z80 port of the system. If people are interested I may be persuaded to provide a Ls-Dos implementation. Dr. Ting will happily sell us the Z80 source code, his implementation manual, and an eFORTH users guide for \$50 each.

This is an option open to real hackers. If you want to know how the system works, or are interested in compilers in general, then this is a fairly good road to go down. However, if you are only interested in using a full fledged FORTH compiler, then I would suggest that you purchase either HartFORTH, or MMSFORTH, they are both reasonably well priced.

Unfortunately that is *all* the TRS-80 based FORTH systems that I know of. There are one or two 8080 based Public Domain FORTH's around but these are designed for CP/M, and are written to the Fig-FORTH standard, if at all.

Now let us turn to the IBM PC side of things. As you would expect there is a grate deal more to choose from. So first we will look at the commercial compilers:

HartFORTH:

This is Andrew Graham's HartFORTH for the IBM PC. There is no difference between this and the Tandy version, except for the fact that it runs on an IBM PC. The nice thing about this, is that you can develop your code on the Tandy, while the same code will also work on the IBM PC by compiling the same code though the same compiler for the different machines.

MMSFORTH:

This is the IBM PC version of the FORTH system developed for the Tandy. It is too all intent and purpose the same as the Tandy version, including the code stripper. Dick and Jill have stopped

supporting the Tandy system, however, the PC version is still supported, and is up to version 2.5.

This has the advantage that you can develop your code on the Tandy system, while the IBM PC system will be able to read your source code directly off the Tandy disk. This can then be compiled, and using the code stripper you can produce a .com for use under the Ms-DOS operating system.

PolyFORTH:

The IBM PC version of *PolyFORTH* system from FORTH, Inc., is a good implementation of their popular system. This system is available for a large variety of systems. Well written code is portable between most of the *PolyFORTH* implementations.

FORTH, Inc., was set up by Chuck Moore, and Bess Rather in 1973 to develop and promote the language. They are still acknowledged as being the world experts in the FORTH language and its applications. Over the last twenty years, several respected programmers have work for FORTH, Inc. Thus the *PolyFORTH* system, has a long and respected heritage.

The IBM PC version is a full FORTH'79 implementation. It comes with a few code libraries, however, most of the useful libraries (such as floating point, data-base management) you have to purchase from FORTH, Inc., at additional cost, or develop them yourself. It's library support is not the best I have seen, but it is simple to add your own support to the system.

The manuals tell you all you need to know about the system, unfortunately I found them hard to read. They are designed to take you through the system, and make triable reference manuals. However, I feel that they also make a bad job of introducing you to the system. I would have preferred a straight forward technical reference manual.

Finally, in order to produce a stand along executable file, you have to get involved in meta-compilation. All in all, I feel that this is a good implementation of the '79 standard, and a good development

system for those who already know FORTH well. It is not intended for use by beginners, and is rather unforgiving. The one thing that saves this package, in my view, is the number of different system it is implemented on.

You can obtain the *PolyFORTH* system from FORTH, Inc.'s UK agents Computer Solutions Limited (0932-829460).

PowerFORTH+:

MicroProcessor Engineering (MPE) are another FORTH based company. They produce many different FORTH products for a growing number of processors, and embedded systems. PowerFORTH is their basic system, while PowerFORTH+ is there IBM PC version of their rather powerful FORTH'83 compiler. They do produce a number of other IBM PC products, including a modula FORTH, various cross compilers, development systems, etc. I suggest you ask them for a copy of there catalog for a full list.

PowerFORTH+ (version 3.2) is a full, comprehensive development environment in the true tradition of FORTH systems. It includes several well written, and very useful libraries, providing windows access, floating point maths and assembler. It also provides the capability of de-compiling code back into structured source code!

I have not seen the documentation that comes with the system. From the catalog it looks comprehensive, although I would not be surprised if you will probably have to purchase one of the tutorial books. However, I have known the people at MPE for some time now, they are friendly and quite willing to help with the simplest of problems.

MPE are also involved in the sponsoring of research in the language, and are part of the ANSI standasation effort.

Version 3.2 of the software comes with an exceptionally powerful code stripper, developed by Sergei Baranoff, head of the programming lab in the Institute for Informatics and Automation in St. Petersburg (he is also one of the examiners for my PhD Thesis).

This is by far the best code stripper that I have seen yet. The version supplied with PowerFORTH+ produces MASM or TASM source files, thus allowing one to generate object code modules in addition to the .com, or .exe stand alone executable files.

Although PC PowerFORTH+ (v3.2) costs some £95, I am happy to recommend this system for anyone wanting to take things seriously. Coming from MPE the support, in the UK at least, will be much better than most of us are used too.

MPE can be found at: MicroProcessor Engineering Limited, 133 Hill Lane, Southampton, SO1 5AF, England. Tel: (0703) 631441, Fax: (0703) 339691, EMail: mpe@uk.co.compulink.cix.

The following compiler is a rather special one, to me at least. It also has a rather strange shareware based policy.

FORTH++:

This system started life as a small 8086 embedded system, controlling an automated TV studio in Southampton. It was later developed to work with Ms-Dos (version 1.0). Over the last couple of years, it's original creator, Bill Stoddart, and I have been extending and developing it. It is now a fully operational FORTH'83 standard system, with floating point, a graphics interface, a connection to the NETBIOS networking system, object orientated programming, multi-tasking, windows Both Bill and I have been using FORTH++ to develop our research idea.

The system offered here is a cut down "evaluation" version of our system that is normally sold along with an RTX-2000 co-processor board. FORTH++ is also implemented on the RTX-2000 co-processor.

I gave a copy of this "evaluation system" to the librarian some time ago. The software itself is free, however, it should be noted that you only get a copy of the binaries. For a fee of approximately £100 we can supply you with the complete source code (most of it written in FORTH). For a fee of £50 we can supply you with a

full correspondence style introduction to FORTH. This is in point of fact the notes that we give to our students when teaching them Real-Time Systems, using FORTH.

For more information on this, contact me at: The Department of Computing Science, University of Paisley, High Street, Paisley, Scotland, PA1 2BE. EMail: pjk@uk.ac.paisley.cs. Or you can get in touch with Dick Miller, as he is selling our system in the U.S.

The following are all public domain compilers. There is an absolute plethora of public domain/shareware FORTH compilers available. I have only listed some of the better ones.

eFORTH:

This is Dr. Ting's portable ANSI FORTH kernel operating under Ms-Dos. There is little to add to my previous comments, except for the fact the you get the 8086 source code with the system. This is a good one to go for if you *really* want to know how a FORTH system works, but insufficient for development system.

FORTHComp:

I have not seen this, but it is written by someone with a fare amount of knowledge on the subject. This is a bold attempt at providing a conventional FORTH'83 standard compiler, as one finds with other languages. It will take a source code file, producing **.com** and **.exe** executables. It is also capable of producing **system**, **TSR**, and **ROM** image files.

It is not a full implementation of the language, and is not extendable. For instance it does not implement the **CREATE ...DOES>** structure. Nor are you able to extend the compiler, thus it is impossible to add a **CASE** structure to the language.

This is a good attempt at a bold idea. Unfortunately its limitations mean that it is useless for anything except the most basic of programs.

FORTHmacs:

Developed by Mitch Bradley. This is an excellent, well thought out, implementation of the FORTH'83 standard, from the creator of the Sun "Open Boot ROM" system. Indeed the Open Boot system uses a thing known as F-Code, this is a platform independent FORTH interpreter. FORTHmacs is the IBM PC version of the compiler used to generate this system.

Whilst this is an excellent system, complete with context sensitive help for the beginner, it has one drawback that I know of. It requires a 386 system with a fair amount of memory to operate. However, this is a full copy of the mainframe version of the compiler that is being used to develop Open Boot firmware throughout the world.

This is a good interactive compiler, with built in file editing facilities. Overall I found this system to be very usable, incorporating many of the facilities that I automatically tend to add. Mitch includes an excellent code stripper, thus allowing you to produce stand alone programs.

If you have the capability to run this version, then I strongly recommend it, both for the seasoned programmer, and the novice. If you don't have access to the networks then contact: Mitch Bradley, Bradley FORTHware, P.O. Box 4444, Mountain View, CA 94040.

FPC:

FORTH PC is a Borland like implementation of a FORTH'83 compiler. This is a very comprehensive compiler, explicitly developed for the PC. It not only has context sensitive help, but also a hypertext help system. This is a full development environment for thoughts who like the Borland way of life.

I personally find it too large. There are parts of the system that I would never use. There are other parts of the system that I simply would not want to use. However, the system is very well supported, and praised by those who use it more regularly than I.

In the more recent versions they have included a code stripper, well more of a compiler along the FORTHComp lines. Thus allowing you to develop your software using this large support environment, utilising as much of the vast library support as you wish. You can then compile your software through their FCOMP system, producing a .com (it may even be a .exe) stand alone executable.

I personally do not like this system, however, it does have a large library of pre-written code. The FCOMP compiler makes it more useful for writing programs that you wish to distribute, rather than giving the complete development environment away. If you like the Borland style development environment, then I would suggest you simply have a go. But be warned, like Borland it does take up quite a lot of disk space.

If you do not have access to the networks, then try contacting the author: Tom Zimmer, Maxtor Corp., 211 River Oaks Parkway, San Jose, CA 95134.

PYGMY:

This is a full FORTH'83 system. It is written by a fairly outspoken member of the FORTH community, who has many unconventional ideas. The system itself is a fair implementation of a standard compiler. Although I must say that the support is good, but limited to EMail only. We get more questions on this system over the networks than any other compiler.

ZEN:

This system was developed by Martin Tracy, one time chairman of the technical sub-committee for the ANSI standard. It was an attempt to keep up with the standard, showing possible implementation for the idea in the new standard and their consequences on normal programming practice. I don't know if Martin has been keeping this up now that the standard is into its fifth public review stage.

This is a good system if you are interested in FORTH, and particularly the new ANSI standard. Otherwise I don't see that this is

of much help to the novice, except as a front line implementation of the basic language.

Again, if you do not have access to the networks then you can contact Martin directly at: Martin Tracy, Up and Running, 2819 Pinkard Avenue, Redond Beach, CA 90278.

Well, that is all I have. If you know of any other related information write it up for the comic. I don't know if this has been of any help, but I do hope so.

Peter Knaggs.

GRAND
GARAGE
CLEARANCE
TANDY
COMPUTER
"THINGIES"
24TH & 25TH APRIL
MIKE
(I'D LIKE TO SEE
THE FLOOR AGAIN)
BARBER
TANGLE TREES
SHUTE HILL
CHORLEY, LITCHFIELD
STAFFS WS13 8DA
0543 685480