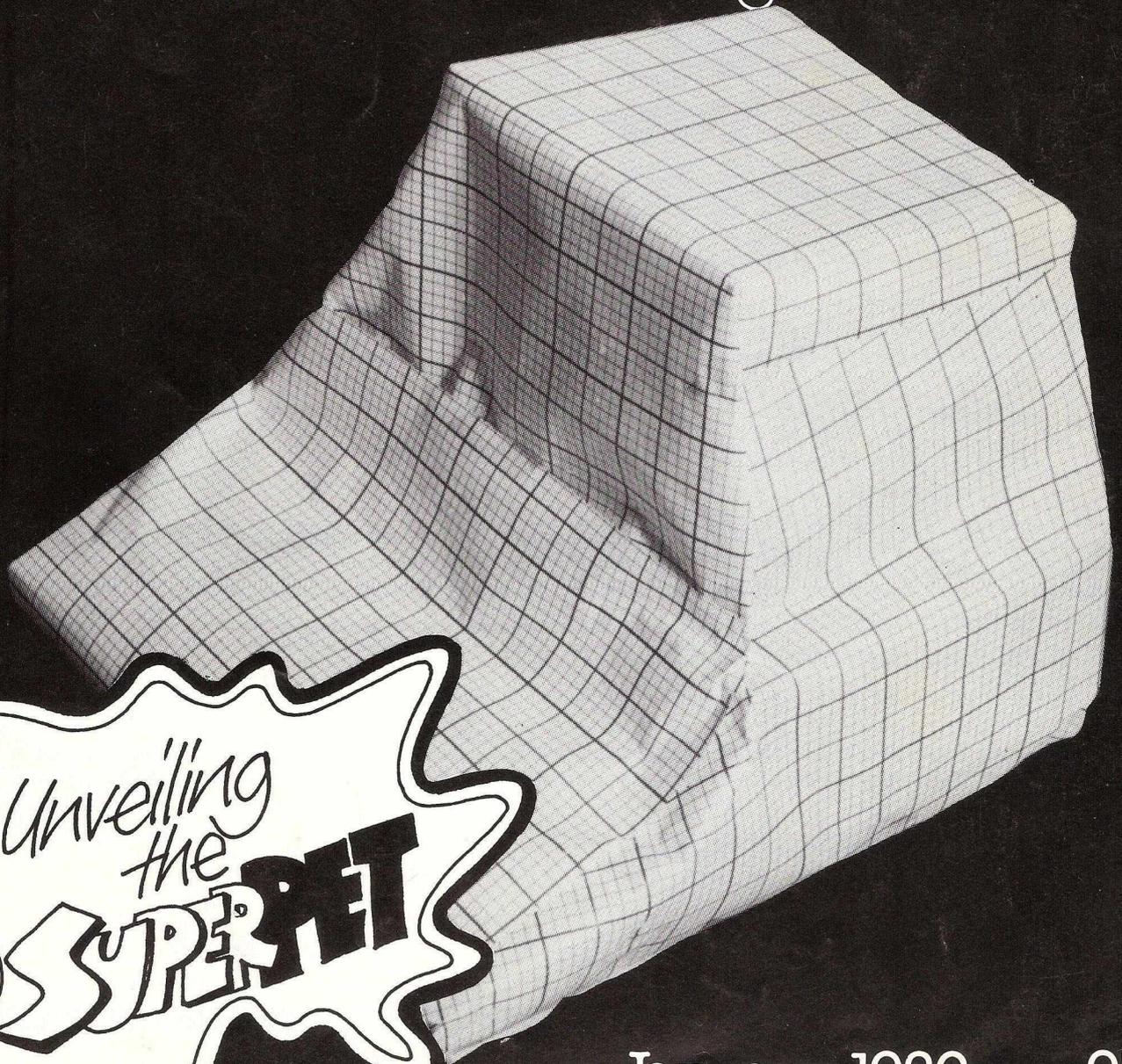


PET
SOFTWARE SURVEY

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The Pet Users Magazine



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January 1980

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Vol. 1, No. 2, January 1980

EDITOR:

Richard Pawson

Art Editor:

Michael Lawson -Foster

Staff Writer:

Nigel West

Advertising:

Wendy Cheetham

Correspondents:

Thomas Turnbull (Technical)
Terry Laudereau (U.S.A. East Coast)
Gregory Yob (U.S.A. West Coast)

Contributing Editors:

Gavin Sanders
Robin Bradbeer

Subscriptions:

Jessica Allason

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EDITORIAL

First of all, a big Thank You to the many people who have supported PRINTOUT, with subscriptions, editorial contributions, and advertising. Now that we have successfully cleared the 'setting-up' hurdles, PRINTOUT looks set to become *the* authoritative voice on PET in Europe.

Reaction to the first issue has been both interesting and entertaining, and we will do our best to tailor PRINTOUT to your requirements. The Manager of one well-known computer store offered to let us serialize his autobiography. We said we would think about it.

Seriously though, any readers with interesting ideas for articles be they applications stories, reviews, programming techniques or even short stories, should drop us a line.

Perhaps the most amusing side-effect of PRINTOUT's publication is the nationwide hunt for the identity of our Gossip Columnist, 'Inside Trader'. Several PET companies and dealers are trying to seek out the 'mole' in their ranks. Sorry, we're just not telling.

Meanwhile, we have lots more goodies in this issue for you to devour. If, that is, you're not too full of Christmas pudding still.

RICHARD PAWSON - Editor

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STOP PRESS: Arrival of the SuperPETs

Commodore will announce a radical upgrade of the PET family early this year. That is the view of informed industry observers in California.

Information in PRINTOUT's possession suggests that development work is now nearing completion on a range of SuperPETs. These feature 12" black and white monitors with 80 column lines, and up to 64K of RAM. UK deliveries are not anticipated before the Autumn.

Also undergoing development at Commodore's Santa Clara HQ are a number of different disk systems including 2 Megabyte industry standard 8" floppies. Chuck Peddle's department are also understood to be working on a Winchester Technology hard disk with "up to 30 megabytes" of online storage. This item is not expected before the end of the year, or later.

PRINTOUT's information is largely confirmed by Commodore's annual report which also makes mention of low cost intelligent modems for linking remote PETs and other systems.

One other product likely to be announced soon is a low cost thermal printer.

British Commodore chief, Kit Spencer, remained tight lipped when asked to comment. "I am not making any product announcements for a while," he said.

Watch this space.

NEXT ISSUE

Is the PET really a business computer?

Commodore Disk System tested

PET Games: The Good, the Bad and the truly Terrible

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HOTLINE—SHOW REPORTS

Once again, winter is here. The cold wind doth blow — and the computer world is besieged with exhibitions. November alone saw four such shows, with the International Business Show and Design Engineering at Birmingham, followed closely by the Personal Computer World Show and Compec in London. Exhibitions being a good opportunity to pick up the latest news and gossip, PRINTOUT despatched hacks to three of them.

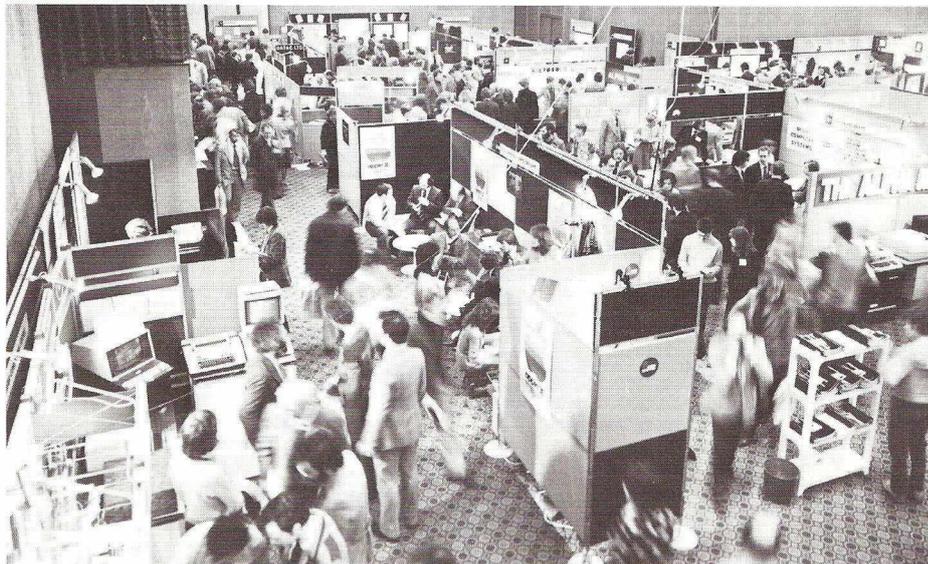
International Business Show

IBS is traditionally a show for 'serious buyers', and judging by the crowd on Commodore's stand, the description of the clientele is an accurate one. Certainly Commodore were taking the show seriously, with a new professionally presented stand, covered in giant photographs of pretty girls with PET Business systems, and even more new leaflets! (The stand was only slightly dwarfed by the neighbouring Post Office monstrosity which took a reported five days to construct.) Demonstrations were chiefly of the new business systems, with standard letters from the word processor being rattled off by the dozen. Commodore were also sharing the stand with several of their 'Endorsees', giving each a 2-day stint. While we were there, Stage One Computers were giving live performances of writing a business package from scratch using the new disk-based PETAID, and Computastore demonstrated 'SUPERPAY' — a payroll suite handling up to 500 employees on disk, with detailed payslips and confidential management statistics.

Coincidentally the only other stand in the Show which concentrated on PETs was sited next to Commodore's — in the form of Sumlock Bondain (who claim that it can't have been coincidence since Commodore kept using their phone!). Sumlock had a new Invoicing/Book-keeper package, written partly in machine code for speed, but with a very comprehensive operation. Both companies seemed pleased that all the 'exhibition groupies' were down at the Sharp stand — playing games.

Design Engineering

Not 300 yards away and running concurrently was the Design Engineering Show with a Commodore stand, comprising three engineering-orientated dealers. Machsize (0926-312542) had their bar-code-reader-in-a-floppy-disk-housing on show, complete with lots of noisy bells and whistles to warn off fiddling journalists. Also present was a nicely converted PET, residing in a rack-mounted casing which graphically showed and analysed the tolerances on a machined shaft placed in the test rig. Clairmont Controls (0632-610210) have written a number of programs for the architectural designer or Civil Engineer. Particularly impressive were the 'Stiff Frame Analysis' — which plotted the frame on the screen while computing the loads and deflections for up to 50 joints, and Critical Path Analysis, plus Resource Allocation for the site manager. Lastly, Radan Computational Ltd. (0225-318483) linked a



high quality digital plotter to PET which, complete with joystick input, produced detailed engineering drawings.

Personal Computer World Show

The third show we visited — PCW — was rather more liberally sprinkled with PETs, so much so that one dealer dubbed it the 'PET Gang Show'. Commodore decided they needed a rest and gave PCW a miss, resulting in comments such as "Like Hamlet without the Prince" from another loquacious dealer. However, the Prince, in the shape of Commodore commandant, Kit Spencer, did put in a belated appearance on the second day, scattering hints about the forthcoming new PETs.

Despite a plethora of more expensive systems, much of the visitors' attention focussed on the new business software for the PET. PETACTION (021-455 8686) showed their new Stock Control package running on the 800K Petsoft Disk system. Priced at £350 including a training course, it handled over 2,500 stock items online with real time updating and full audit trail. Another interesting piece of software was the Incomplete Records Accounting suite announced by Lancashire dealers, Megapalm Ltd.

One showstopper was the 11 megabyte

Winchester disk system by Corvus which appeared on the Keen and Comart stands. A PET compatible version is expected by the summer. In the meantime, B&B Consultants (0204-26644) had been busy with a daisychain of up to six Compu/Think disk drives which should offer 4.8 Mbytes of storage online.

The Commodore Disk system featured in a demonstration of the Plessey bar code reader now being sold by Petalect of Woking (04862-69032). Yet a third system was shown by Analog Electronics, in the shape of the sidesaddle Petdisk, priced at £850 for 250K bytes online storage.

Several software houses exhibited including Softprint with a new cassette magazine called Lettercette. Petsoft (021-455 8585) operated a software supermarket selling programs, PET workbooks and Programmers Toolkits right off the stand. "Customers even tried to buy the Petsoft T-shirts off our backs," reported Peter Oldershaw.

Where did all the PET dealers keep disappearing off to? PRINTOUT discovered that ACT Petsoft had booked a private suite; but Julian Allason was not saying a thing — for once. The arrival of a new PET peripheral may well be imminent. Our investigations continue. . . .



PET after cosmetic surgery in Machsize's process monitor

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DUMP	Displays the names and values of all the variables used by your program (excluding arrays)
HELP	If your program stops due to an error, HELP displays the offending line and where the PET detected the error.
TRACE	As a program runs, the last six line numbers being executed are shown in the upper right corner of the PET's screen.
STEP	Executes one BASIC line and stops. Pressing SHIFT executes the next line. The line number is displayed in the upper right corner of the screen
OFF	Turns TRACE or STEP off

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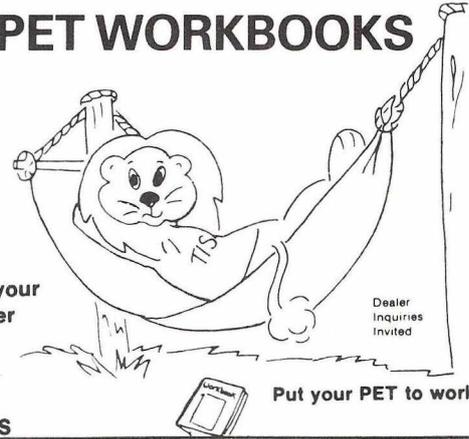
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“IN THE PUBLIC EYE”—Application Feature

Someone once said — “I don’t know what Public Relations means exactly, but it always seems to smell of alcohol.” In fact, contrary to popular belief, Public Relations (PR) is not an endless round of expense account lunches and exclusive social gatherings. Behind every press release and announcement is a whole mass of routine administrative work. Mailing lists have to be updated, press contacts followed up and detailed activity schedules organised. This is on top of the conventional activities associated with a business, including invoicing and accounting. Computerisation is an obvious move, leaving the consultants with more time for their trained function of liaising between clients and the media.

That there has previously been no system written for such users is hardly surprising, in view of the relatively small numbers of PR firms, and the need for ‘inside’ specification and evaluation. Recently announced, however, has been a new package entitled PRESS to be implemented on a PET system. The initiative for this development has come from Baroness International Public Relations, a small but successful company, specialising in publicity for electronic equipment manufacturers. If the name Baroness rings a bell, it is because they happen to be the company which handles all Commodore’s PR. Our initial reaction of “Oh, this is just another publicity stunt by Commodore” proved to be unjustified. Baroness actually received very little help in writing the software from them, and had to turn to bespoke-specialists Stage One Computers of Bournemouth, as consultant programmers.

The first stage in producing PRESS was to categorise the main routine tasks of the company into computer-implementable systems. Two main requirements were identified and with the benefit of experience, they seem to cover most of the day-to-day administrative work.

First, an activity planner was needed to provide a daily check on the activities undertaken on behalf of each client over the previous 12 months. A cross-referencing system would be capable of displaying all Pending Matters, according to the client, date or type of activity. All data could be compiled into a monthly Client Activity Report, to be output on the printer.

The second main requirement was for an advanced Mailing List system to handle press releases and other communications. Although several such programs can be bought ready-written, Baroness calculated that any one of 300 names and addresses must be instantly available and some could be extracted under 100 different subject references. Obviously a floppy disk unit was indicated, programmed to perform Random Access extractions.

Baroness decided on the standard PET, 2040 disk and Commodore tractor-feed printer configuration and commissioned Stage One to convert their requirements into a program. There followed months of trial, evaluation and alteration to achieve the workable solution. “We began to realise,” says Ilona Uhl, Baroness’s Managing Director, “that our system would be applicable not only to other PR companies, but to advertising agencies and even editorial offices.” The activity planner, for example, can be used to enter and keep track of features for each issue, page or column of a publication.

Accordingly, after installing PRESS in their own office, Baroness drew up specifications for two commercial systems to be aimed at the aforementioned companies. PRESS 1, which is priced at £3,280 consists of the standard hardware configuration plus the following software packages: ACTIVITY PLANNER, MAILING LIST, SALES ACCOUNTING & INVOICING, PURCHASE AND NOMINAL ACCOUNTING, CLIENT COSTING and BANK ACCOUNT RECONCILIATION. The tractor-feed printer is used for producing invoices as well as self-adhesive labels for addresses and multiple copy photograph captions.

PRESS 2 incorporates a daisy wheel printer plus a word processor to handle standard letters, and is priced at £5,621. The costs apparently include a three day training course, run by Stage One.

These systems are an interesting example of the ways in which the power of microcomputers is now being harnessed by small businesses and even ‘one-man’ bands. For less than the cost of a secretary’s salary, PET provides a lot of powerful features. The one thing it cannot do is eat those expense-account lunches!



Ilona Uhl using “PRESS”

READ/WRITE

Your Questions Answered

Letters are now coming in regularly, and we will try to answer as many as we can — Read/Write will be expanded as time goes on. We particularly invite queries from people considering the purchase of a PET, as well as questions concerning operation and application, from existing users. We also want to make Read/Write a forum for the exchange of programming tricks and routines — so send us your discoveries. . . .

Dear Sir,

I saw a copy of PRINTOUT Issue 1 and must say that it contained a lot of useful information — keep it up! Since you invited readers queries, perhaps you can help me with what may be a trivial problem. I purchased a Commodore 2040 floppy disk, and quickly got the hang of the simpler commands, but the manual doesn’t say how to SAVE and LOAD machine code programs on the disk. Is there a simple way of achieving this?

T. Hiscock

We found that the simplest method of SAVEing machine code programs is via the Machine Language Monitor built into the new ROM. If, for example, you have a m/c code routine residing in \$033A to \$0361 which is to be saved under the name “EXAMPLE”, proceed as follows:

Type SYS64785 to access the Monitor. Then type:

S “1:EXAMPLE”,08,033A,0362

Pressing ‘Return’ will save the routine on disk 1 (assuming you have already OPENed and initialized). The routine will be recorded on the directory as a program (PRG) file and can be loaded back into \$033A in the same way as a normal BASIC program. Three things should be noted:

- (1) To SAVE on drive 0, the name should be “0:EXAMPLE” as in a normal disk SAVE.**
- (2) The device number must be 08 as above.**
- (3) The ending address (0362) is the byte after the last m/c code instruction.**

* * * *

Dear Sir,

Congratulations on your first issue — which I devoured with much enjoyment. You seem to have got off to a good start, content-wise, but if you want “comments and suggestions”, how about some home-built articles on things like simple interfaces etc?

David A. Graham

Thanks for the suggestion. Those kind of articles are hard to come by, but we will do our best! Any readers who have built their own add-ons, please send us details.

* * * *

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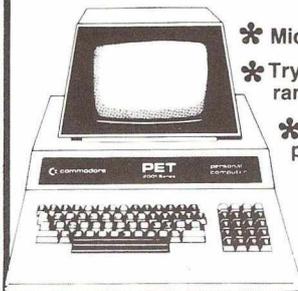


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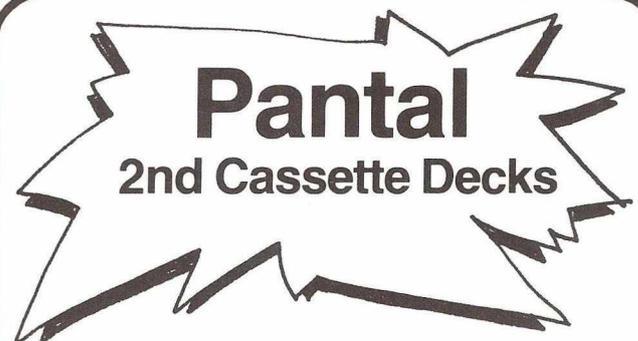
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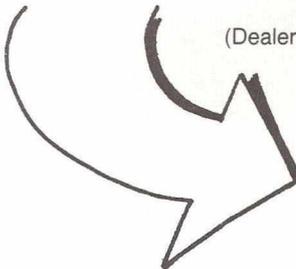
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(Continued)

READ/WRITE

Dear Sir,

Some time ago, while writing a business program, I encountered a problem on INPUT Statements which proved to be very evasive. You may like to pass it on to your readers, since I wasted a lot of time searching for a fault in my program, when the cause was really a minor bug in PET's operating system.

It occurs when an Input is done from the bottom line of the screen, as may happen after a series of questions at the start of any program. Your answer is usually entered after a prompt message on the same line. If the answer is longer than a certain length, it will overflow onto the next line; this is normally acceptable up to the BASIC Input limit of 80 characters – not so on the bottom line, however. If your reply carries over onto the next line (thus causing the prompt and first part of your reply to jump up a line) BOTH the reply and the prompt will be put into the Input string – causing some very peculiar results!

To avoid this, it is necessary to arrange Input statements so that they don't fall on the bottom line of the screen. If, however, you have a large number of Inputs – as in my business program – insert the following line before any Input that could be susceptible to this problem:

```
IF PEEK(196)+256*PEEK(197)>33648
THEN PRINT "CLEAR SCREEN";
```

This simply clears the screen and restarts from the top whenever the cursor gets near the bottom of the screen.

Finally, I should point out that this is a particularly obscure and not very serious bug, but it can be rather puzzling.

P. D. Barker

Dear Sir,

I noticed while POKEing the screen memory, that each address is repeated 4 times in the RAM. For example: 32768, 33792, 34816, or 35840 will all access the top left hand screen position. Does this mean that there are really 4K bytes of screen memory, of which 3K are effectively wasted?

Terry Spicer

The answer is no – the screen is in fact 1K bytes with 3 'reflected images'. Instead of having 16 address lines to its memory, PET has 12 lines (which can address up to 4K of RAM) and 16 Block lines – each one individually selecting a block of 4K bytes. One of these lines is assigned to the screen, and the 1K of RAM is connected to the 10 least significant bits of the 12-bit bus – resulting in any byte recognising 4 addresses.

The interesting point here is that while the screen has 1000 (40x25) positions, a 1K RAM has 1024 bytes. Where are the lost 24 bytes? You can in fact use them to store information by PEEKing and POKEing locations 33768 to 33791. However, the contents of these bytes are interfered with, every time you clear the screen or scroll from the bottom. Still, for the 'mean' programmer 24 bytes is a lot of space. . . .

Short Story:

A VISIT TO THE COMMODORE

By Julian Allason



The Building was long and low, its sloping roof angled to cast the interior into permanent shadow.

As I pulled into the empty parking lot, I recalled that the architect had won a prize. It had been the first solar powered factory. The award must have been for energy conservation.

I switched off the ignition and the air conditioning died with a whine of protest. Heat began to seep into the car. I found myself sprinting for the entrance.

Inside I paused for a moment, allowing my eyes to adjust. Gradually, I made out bare concrete walls, thick pile carpet, and a desk. Behind it sat a girl, perfectly composed, hair pulled back into a bun. On her nose sat a pair of old fashioned horn rimmed spectacles. The sort Californians wear when they wish to be taken seriously.

"Please identify yourself." She gestured me to a PET. I sat down at the keyboard.

"WELCOME" the computer printed on its screen. And then after a moment "PLEASE ENTER YOUR NAME". I did so. "OCCUPATION?" I could feel the girl's eyes on me. "JOURNALIST" I typed. The screen blanked and I could sense it crashing through conditional branches.

"ENTER PUBLICATION?" The girl was studying her nails now.

"Is this really necessary?" I asked. She continued to examine her cuticles for a moment. "The Commodore likes to have as much information as possible," she said. "He does not often given interviews."

Clearly she was given to understatement. I had failed to unearth a single interview with the Commodore in our cuttings library. Indeed, there were some who doubted the existence of this mysterious figure who controlled one of America's largest corporations.

"You are cleared to proceed. Enter this door, turn left and follow the red arrows." She smiled a professional smile for a moment, before reverting to her manicure. The PET started to scroll columns of numbers up the screen.

The corridor was long, brightly lit and completely deserted. I followed the arrows, passing doors marked with hexadecimal numbers. Some of the numbers seemed oddly familiar.

The arrows petered out in an empty lobby. Off it led eight doors and four

passages. There was no one to ask.

I tried a door. Locked. There was something about the layout of this building which struck a cord in my memory. I tried a passage. It led to another locked door; it bore the legend 'Block 0 \$219'.

Block 0 might be the number of the building but 'Block 0 \$219' just happens to be the location of PET's interrupt vector.

Light began to dawn. The whole building was laid out like a gigantic computer – a Macrocomputer. What I needed was a map – a memory map!

Sitting down on the cold floor I started to sketch, racking my brains for locations. The second cassette buffer – surely that was at \$333A?

If my theory was correct, where I had come in was Page 0, \$A to \$5A, the BASIC Input Buffer. I retraced my steps until once again I found myself on the inside of that door. Sunlight filtered through beneath it. There was no handle. Straining with my ear to the wood, I fancied I could hear the girl speaking softly into the telephone.

How to find the Commodore? If one followed the logic path, there might be a shortcut through the Screen Editor. I consulted my plan; that would be \$E000 to E7FF in Block 7.

With only two wrong turns I found my way to Block 7. Sure enough \$E000 was the fifteenth door along. It opened into a high chamber. The walls appeared rough and unfinished. At the far end were double doors, which rocked slightly in the air current. This would be the back entrance to the Central Processor. I hurried towards them, my footsteps setting up a thousand complex echoes.

"Well done" said the old man at the work bench, laying down a soldering iron. "Did you pass the Wall Street Journal by any chance? He has been out there for weeks. So few journalists have logical minds, I find."

As he offered me a gnarled hand I noticed a flash of gold at the cuff. "Not the Commodore by any chance?" I asked. "No, no" he laughed, motioning me to a seat. "I am afraid there won't be any interviews today. The Commodore isn't working. And I simply can't find out what the matter is."

It was then that I noticed the pile of P.C. boards and components spread out on the work bench.

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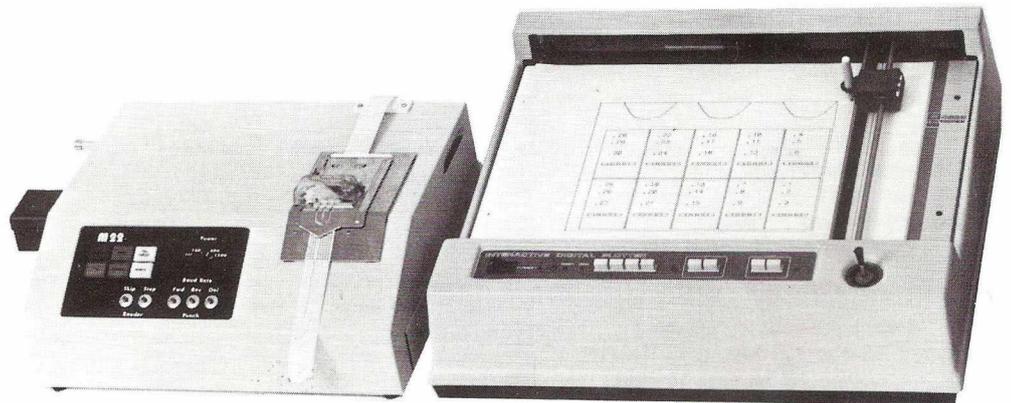
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Professional Disk Drives: PART 1. COMPU/THINK

For most business applications a disk drive is essential. Its speed allows a single program to be located, loaded and verified or files manipulated, almost instantaneously. The memory capacity of the PET is also effectively increased to as much as 800K online. This allows complex ledger or stock control operations to be conducted without the need continuously to load and save cassette tapes, a lengthy and uncertain process at best.

For the more casual programmer a disk system offers the opportunity to access any one of a whole library of programs or sub-routines without delay, and is an invaluable aid to program development.

In the past disk drives have not always proved themselves reliable, and double density systems have been particularly prone to data loss. PRINTOUT decided to evaluate the two most popular systems available for the PET.

First we report on the Petsoft disk drives manufactured by Compu/Think and priced from £795. Next issue we will be publishing our findings on Commodore's own system.

There are four principal considerations that a potential user should take into account when buying a disk drive. These are: storage capacity, speed in accessing data, ease of use and reliability. This does not infer, however, that the greater the storage the better the system, since many applications do not require large or numerous files.

Considerable improvements have been made to the Compu/Think disk operating system (DOS) since its first appearance early last year. The storage capacity has also been boosted, the maximum per unit now being an impressive 800K. A few distributors have also advertised 1.6+ megabyte systems, achieved by daisy chaining two drives together. This is the largest online store currently available for the PET. It is possible that an 11 megabyte hard disk will appear late in the year. However, floppy disk storage would still be required for security.

Compu/Think designed its own DOS which extends and expands the standard Microsoft BASIC resident in the PET. Seven extra commands are available in the Ready mode along with nine more for disk handling. Datafiles may be utilized by both direct and sequential accessing methods. I/O error trapping is incorporated into the software, but is not as sophisticated or as complicated to use as that of the Commodore 2040.

Extended direct commands include (where D is device number and F\$ is File name):

\$FORMAT,D	Prepare a new diskette for use.
\$DIR,D	Display disk directory information.
\$LOD,D,F\$	Load program into memory from disk
\$SAV,D,F\$	Save a program on disk
\$ERASE,D,F\$	Erase a program or file from disk
\$GO	Begin execution of a machine language program
\$MEM,AS	Displays a page of memory

Extended disk BASIC instructions are:

\$ODISK,D,T\$,F\$,I\$	Opens a data file
\$CDISK	Closes a data file
\$RDISK,R\$	Reads a data record
\$WDISK,R\$	Writes a data record
\$XEQ,D,F\$	Loads and runs another program

Additional commands display a page of memory, reset memory, list to a printer and print strings on a printer.

A useful feature is that all commands may be abbreviated by using a \$ followed by the First letter of the command, e.g. \$SAV,1,"PROGRAM" can be abbreviated to \$S,1,"PROGRAM".

We found that the system was exceptionally fast in operation, locating and loading an 8K program in less than two seconds. This is due to the way in which the DOS reads a whole track at a time.

Once formatted each 5¼" diskette is organized into 40 tracks with a disk directory located in absolute track 0.

All free disk tracks are automatically made ready for the next file allocation, thereby eliminating the need for tedious disk to disk copying. The minimum space allocated to a file or program is one track. A maximum of 39 files can therefore be allocated to each diskette, or side in the case of the double sided drives. Since each track has a capacity of 5K bytes, any file longer than this will overlap onto the next track, thus reducing the number of files that can be accommodated.

We found the file management easy to use. Data set up for recovery by direct access was very quickly read in comparison to the time required by other microcomputers such as the Apple and TRS-80.

There appear to be a few bugs in the software, most of which are explained in the manual. These could prove irritating to the programmer but had been successfully bypassed in the commercial software packages we tested.

The command for displaying the amount of free memory, "PRINT FRE(0)", when used in the READY mode could cause the system to crash unless all variables are cleared. This does not occur, however, when it is placed in a program. A RUN command solves the problem. Likewise, when reading or writing to disk, the system could crash after a couple of seconds if a non-existent datafile is being accessed, or if there is no diskette in the drive. There are

one or two more but they can all be bypassed if reasonable care is taken.

At the time of writing, somewhat more business software was available in Britain for the Compu/Think system than for Commodore. PETACT have Sales/Purchase Ledgers, Invoicing and Stock Control, Intex Datalog a Payroll package, HB Computers a Sales, Purchase and Nominal Ledger suite, and Petsoft a Mailing List, Stock Control and Word Processor package. All of these titles did well in our survey of business software (PRINTOUT No. 1). The PETACT packages bear the Commodore recommendation.

From user enquiries we established that the hardware appears reliable; no problems with head alignment or overheating were encountered.

For the old standard 8K PETs an Expandamem 24K expansion board is required. At £320 it is not the cheapest on the market. One would expect that 24K plus 8K would give 32K of RAM. This is not in fact the case since the DOS takes up approximately 8K of user RAM, leaving only 23551 bytes free.

Compu/Think have now overcome this problem and drives for the model 16/32K PETs neither lose RAM nor require additional memory. The disk controller board supplied with the drive unit fits inside the PET quite neatly. No heat problems were encountered.

Conclusions

Overall we were impressed with the speed and reliability of the Compu/Think disk drives. What they lack in software sophistication is more than made up for by ease of use. Not inexpensive but good value. The availability of good software from a variety of sources is a further plus point.

Prices

800K double density double sided dual drive (for new ROM PETs)	£1145+VAT
400K double density dual drive (for new ROM 16/32K PETs)	£875+VAT
400K double density dual drive (for old ROM 8K PET; requires Expandamem)	£795+VAT
24K Expandamem internal memory expansion board	£320+VAT

Availability: From most PET dealers. In case of difficulty contact ACT Petsoft on 021-455 8686 for name of nearest stockist and information sheet.



PET plus Compu/Think Disk Drives

PRINTOUT SURVEY

PROGRAMMING AIDS

One of the reasons advanced for PETs astonishing success, is the wide range of software packages available. In terms of utilities the PET is almost certainly the best supported microcomputer in the UK.

PRINTOUT examined the programming aids now available. They ranged from simple sort routines through some fairly sophisticated assemblers to full blown database management systems.

Almost all the routines we evaluated performed satisfactorily, although many could have been improved to run more quickly. There was considerable price variation between similar packages. We have therefore taken value-for-money into account in grading. We rated programs as follows:

*Poor **Fair ***Good
 ****Outstanding

Absence of star rating indicates that we were not able to test the program, but that it is known to exist. Programs rating less than 1 star have been omitted from the results.

N.B. Prices quoted are exclusive of VAT.

Suppliers

Computastore Ltd.
 16 John Dalton Street
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J. C. Leman
 47 London Road
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 Tunbridge Wells
 Kent

The Softwarehouse
 146 Oxford Street
 London W.1.

Commodore Systems
 360 Euston Road
 London N.W.1.
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I.P.U.G.
 9 Littleover Lane
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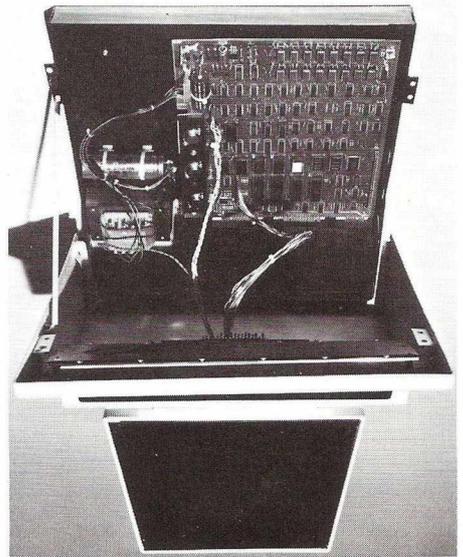
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Title	Price £	Minimum Configuration	Availability	Test Rating	Description
Alphasort	4	8K	Petsoft & Dealers	***	Sorts up to 100 words - e.g. names with initials - into ascending or descending order. Simple sort, useful as subroutine.
Assembler	50 60	8K CBM Disk	Computastore	***	Written in machine code for speed, assembles up to 500 lines per minute on Disk. Allows up to 200 symbols on an 8K PET or 1000 on larger PETs. Commodore Endorsed.
6502 Assembler/ Editor in BASIC	25 30	8K 8K & Disk	Petsoft & Dealers	***	Accepts all 6502 mnemonics, pseudo-ops and addressing modes plus new TEXT pseudo-op. Evaluates binary, octal, decimal, hexadecimal and character constants, symbols and expressions. Assembly source programs are created with Text Editor. Good value but slow compared to more expensive machine code versions.
ASMPAC	25 28.50	8K old ROM only 16 & 32K PETs	Leman		Assembler, Text Editor & Disassembler. Test Assembles, assembles direct into RAM or assembles object code files for later processing with optional additional programs (£5). Includes manual. Commodore Endorsed.
Assembler Development System	50	16K & Commodore Disk	Commodore Dealers	****	Written in assembly language, includes screenbased editor with all DOS support commands plus Find, Change, Auto-number, Renumber and Block Delete. Source & object files reside on disk. New Machine Code monitor executes in controlled fashion, reducing debug time.
Autograph	7	8K	Petsoft & Dealers		Plots graph of an algebraic function with one unknown determining correct scale, labelling axes, etc.
Auto Line Numberer	5	8K	Petsoft & Dealers	***	Automatically generates next line number when Return is pressed. Increment and starting point specifiable. Includes block delete. Useful where many datalines or text to be keyed in.
Butterfields Encyclopaedia	12	8K	Petsoft & Dealers	****	Many utilities, including Data Finder, Keyboard, Record, Copycat, RPN Calculator, etc. Very good value.
Cassette Filing	8	8K	Petsoft & Dealers	***	3 program tutorial on tape files, with patches for old ROM bugs. Test File Handling. Well presented.
Data Base Utility	15	8K	Commodore dealers		Allows user to create, maintain, and examine files of data on cassette. All data held as strings. Needs 2nd cassette deck.
Data File Handler	12	8K	Petsoft & Dealers	**	Subroutine providing basic file handling operations on one or two cassette drives.
Diagnostic	8	8K	Petsoft & Dealers	***	BASIC & Binary programs test all RAM and displays locations of any fault.
Disassembler (Computastore)	22/25	8K	Computastore		Also displays PETs ROMs and searches them for strings of characters or patterns of hexadecimal bytes. Outputs to screen or printer.
Disassembler (Commodore)	15	8K	Commodore dealers		Lists from specified starting location, gives full mnemonics and handles ASCII codes.
Disassembler (Petsoft)	12	8K	Petsoft & Dealers		Disassembles machine code at specified address outputting 16 lines with option to continue; by-passes PEEK protect.
Enlarge	6	8K	Softwarehouse		Text entered is displayed in large letters.
Format	8	8K	Petsoft & Dealers	****	3 program tutorial demonstrating subroutine to format PETs numeric output. Controls number of digits, position, etc. Useful.
FORTH	30	12K	Petsoft & Dealers	***	Interactive compiler/interpreter for FORTH languages. Standard vocabulary of 200 "words" can be used to define new commands, thereby creating a new language for a specific application. Incremental Assembler, Text Editor, Block 110 Buffers etc. Very Fast. Welcome addition to PETs capabilities.
Formatted Lister	15	8K	Petsoft & Dealers		Lists programs to printer in reformatted form with abbreviations for special characters (CUL=Cursor Left). Numbers pages etc.
Freehand	5	8K	Petsoft & Dealers	**	Allows keypad to fast graphics work without Return or Cursor controls. Auto Save. Incorporates Plot Function. Not the best version we have seen.
Graphics Pack	12 20	8K Disk	Petsoft & Dealers	***	3 programs: DOODLER for quick creation of pictures, charts, plots. PLOTTER plots equations on 80x50 grid with auto labelling or scaling of axes. BARPLOT automatically creates bar graphs from specified values. Good value.
Hex Editor	3	8K	Commodore All dealers		Allows you to edit, insert, delete, load and save HEX programs
Hexadecimal I	5	8K	Databank		Converts decimal numbers to hexadecimal and vice versa.
Keyboard	30	8K	Computastore		Big keyboard terminal or printer can be employed as a dumb terminal for keying in BASIC programs or data. Also provides a useful method of speeding up data entry.

PRINTOUT welcomes readers' comments on these, or other software packages.

Large Character	8	8K	Petsoft & Dealers	***	Converts your text into large letters on screen; slow scroll or page mode. Useful for lectures or commercial displays.
Line Renumber (Petsoft)	7	8K	Petsoft & Dealers	***	Machine Code routine rennumbers all lines & GOTO, FOSUB, IF ... THEN references.
Line Renumber (IPUG)	5	8K	IPUG		Rennumbers lines & GOTO, GOSUB, IF ... THEN references. £2.50 to IPUG Members.
Link	10	8K	Petsoft & Dealers	***	Joins as many programs as available memory allows — if you are careful.
Lisp	75	16K	Commodore Business Dealers only		Interpretive language for artificial intelligence operations, but also said to be suitable for relational database applications. Over 80 functions. Includes 2 demo programs.
Machine Code Handler	12	8K	Petsoft & Dealers	**	Utilities to assist machine code programming inc. Hex-Dec conversions and vice versa, execution and core display from specified locations etc.
Memory Mod	6	8K	Petsoft & Dealers	*	Hex to Dec, Dec to Hex conversions, examines all addresses except BASIC interpreter.
Merge	8	8K	Petsoft & Dealers	***	Joins subroutines, data or programs. Useful.
Multi Key Get	4	8K	Petsoft & Dealers		Allows PET to recognise more than one key at once.
Overlays	8	8K	Petsoft & Dealers	***	Tutorial demonstrates how to transfer variables, subroutines and sections of programs from one program to another.
PDAS 32	20	32K	Petsoft & Dealers	****	Program Development Aid System includes Line Renumber, Block Delete, Lister for listing programs to printer with special characters rendered as CUL= Cursor Left, etc. First Class!
PEEK & POKE	5	8K	Petsoft & Dealers	**	No more than an introduction to PEEK & POKE commands. Good as far as it goes.
PET BASIC Tutorial	15 19	8K Disk	Petsoft & Dealers	****	Well written course on programming PET in BASIC, over 50K in all. Covers all PET commands, some in insufficient detail. Recommended.
PET Demo	5	8K	Petsoft & Dealers	**	Demonstrates PETs capabilities to novices.
PETE	200	8K Commodore Disk	Computastore		Software package turns PET into an intelligent RS232 terminal with user definable transmission parameters.
PETSIL	10	8K	Petsoft & Dealers	***	CESIL language interpreter for mathematical applications. Useful addition to PETs capabilities.
PILOT	10	8K	Petsoft & Dealers	***	Good implementation of the interactive PILOT language, especially suited to Computer Aided Instruction but also for other conversational applications.
Planner	8	8K	Petsoft & Dealers	***	Advanced planning program in which President's analysis is performed on your network.
Plotsub	6	8K	Petsoft & Dealers	***	Machine code subroutine can be called by your BASIC program for double density plotting. Widely used utility.
Programmers Toolkit	55 75	PET 2001-16 & PET 2001-32 PET 2001-8	Petsoft & Dealers	****	Plug-in ROM chip with 9 most useful utilities written in machine code. Includes RENUMBER, APPEND, DUMP, HELP, TRACE, STEP, FIND, AUTO NUMBER, DELETE. Recommended by Commodore.
Quicksort	10	8K	Microtech	*	Not quick at all. Poor value.
Screenstore	4	8K	Petsoft & Dealers	***	Much improved version of original routine for storing contents of screen RAM. Handles up to 4 screens full.
Search & Find	5	8K	Petsoft & Dealers		Finds specified program on a tape under fast forward control.
Self Monitor	7	8K	Petsoft & Dealers	***	TRACE in STEP mode. Checks program execution line by line and variables below line 999.
Software Maths Enhancer	9	8K	Petsoft & Dealers	***	Software method of enhancing PETs mathematical abilities. Includes RPN calculator, Hex arithmetic, Fourier Explicit, Small and Large Primes etc.
Step by Step	19.50	8K	Petsoft & Dealers	***	American written tutorial in BASIC programming for beginners. 10 two-part lessons, tests, etc. Well presented with 60-page manual. 3 Cassettes.
Strathclyde BASIC Course	12	8K	Commodore Dealers	****	Excellent course on programming PET designed by Prof. Andrew Colin. Many exercises and accompanying manual.
System Extension	12	24K	Petsoft & Dealers	***	Allows up to 10 BASIC programs to be stored in RAM at once for instant individual retrieval. Includes Renumber and Block Delete.
TIM Monitor	4	8K	Commodore Dealers		Tape loaded monitor for old ROM PETs. Revised version resident in ROM on new PETs.
WSFN Robotics	10	8K	Petsoft & Dealers		Robot Control language using one-letter commands to instruct robot turtle in 78x39 grid.

HOW PET WORKS: PART 1—VIDEO LOGIC



This is the first of a series of articles in which we shall be describing the way PET works internally. Knowing the structure of a system is not only very satisfying, but useful in tracing hardware and software bugs. Many of the schematics shown have been simplified for the sake of clarity, but all show the underlying principles. We kick off with an explanation of PET's Video Logic.

The commonest form of visual output from a computer is the VDU or Television Screen. Unlike a laboratory oscilloscope which produces graph type patterns in response to the waveform being fed into its terminals, the VDU is a digital device. The screen is split up into a finite number of dots — each one of which can be 'on' or 'off'. However, since most output from a microcomputer consists of text or numbers, it is desirable to be able to generate characters on the screen, consistently and easily. Each character occupies a fixed area, usually an array of 8x8 dots, and the pattern required for that character is stored in the machine's fixed memory or ROM.

PET's operating system goes one stage further. The individual dots on the screen are not accessible; instead the screen is divided into character positions or blocks. A large number of characters are available for placing in these (40x25) positions, including a number of graphic or diagrammatical characters. This approach is annoying to users requiring high definition curve plotting, but enables diagrams and other illustrations to be constructed very quickly and without complex programming.

The simplest method for placing characters on the screen is by means of the BASIC PRINT statement. Characters are placed in successive positions on the screen, although there are a number of control functions such as cursor movements and carriage return/line feed. Many users will know that there is a more direct method of accessing the screen, which is more convenient for certain functions such as graph plotting and games.

The thousand character positions on the screen actually represent a thousand bytes

INDEPENDENT PET USERS' GROUP (IPUG)

IPUG has grown rapidly over the last few months and is now seeking to expand its membership to include as many PET users as possible.

The advent of the new business PETs, complete with disk drives and printers, has meant that many small businesses are now using computers for the first time. Many of these new users have joined IPUG in order to meet other users and to share problems and ideas.

Hundreds of PETs are now in use in education and there is a pressing need to co-ordinate much of the excellent work being done with them. Similarly PETs are in use throughout industry doing anything from producing statistics to controlling plant. Add to this the large number of hobbyists using the PET and there is an obvious need for an organisation such as IPUG.

IPUG is a national organisation which produces a bi-monthly magazine dedicated to the PET. The magazine is intended to provide a forum for members' ideas and a channel for keeping them informed on all matters relating to the PET. To do this IPUG is in contact with user groups throughout the world, and also monitors the computer press for information about the PET.

To make it possible for members to meet on a regular basis, IPUG has regional organisers throughout the UK who arrange meetings, talks, demonstrations, visits, etc.

IPUG is run by PET users, for PET users. All officers of the group are unpaid and volunteer their help in the hope that PET users will gain from the sharing of information. Offers of help are always appreciated.

The group also offers a library of programs that may be purchased at a nominal cost, and funds raised in this way go towards keeping the national subscription down.

The national subscription for 1980, from January to December will be £6.50.

All applications for membership should be addressed to:

General Secretary:

Eli Pamphlett,
The Coppers,
Sudbury Road,
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IPUG

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(Continued) HOW THE PET WORKS:

of RAM, which may be PEEKed and POKEd like other locations in RAM. Each byte contains the character code (a number in the range 0-255) for the character that is being displayed in the corresponding position on the screen. These character codes are related to the standard ASCII codes but are not the same. It is necessary to have this different code, in order that the full character set can be covered. The latter consists of 64 ASCII characters, 64 graphic characters with a Reversed Field option on both – totalling 256. It should be noted here, that the PET can only be in Graphics or Lower case mode exclusively; no more than 256 different characters can be on the screen at any one time.

So far so good. But how does the hardware convert this code into an 8x8 dot matrix? The diagram below shows a simplified schematic of the video logic on the PET. If you study the relevant circuit diagram, you will see that there is much more timing involved than shown below. We have also omitted the hardware responsible for driving the horizontal and vertical scanning of the screen.

PET's operating system communicates with the 1K screen RAM by means of its standard 8-bit Databus and 16-bit Address bus. Since the video logic must also regularly inspect the contents of the RAM, a 'one of two' selector is necessary to prevent two addresses being sent at once. The video logic is timed by hardware circuitry and does not interrupt the working of PET – as does the keyboard scanning mechanism. The one of two selector always gives priority to the addresses coming from PET. This is why, whenever you PEEK and POKE the screen RAM directly, white bars (sometimes called 'SNOW') flash around the screen. Whenever you PEEK/POKE the video logic is deprived of the code for the byte it was inspecting. On the 16 and 32K

PETs, the operating system and video logic access the RAM at different times during the clock cycle and hence this problem should not occur.

The scanning electronics covers the screen with 200 lines. As each character position is 8 lines deep, the logic must find the pattern of 8 dots (or bits) for the appropriate line of the character in that position. To illustrate this process, we will take as an example, the case where the scan is on the 11th line down (i.e. the 3rd line down of the 2nd row of characters) and is 3 blocks in from the left. (See fig. 2.) The counting circuitry computes that this is in RAM location 32811. It sends this 16-bit address, via the selector, to the RAM. The RAM then puts the character code for that byte on the data bus – for example, 18 represents the letter R. This passes on to the character generator.

A character generator is simply a ROM (in this case a 6540 chip, mask-programmed by Commodore). The bytes contain sets of 8-bits or dots. For example, byte 1 contains the top row of character @ i.e. 00011100, byte 2 contains the 2nd row of @ i.e. 00100010, byte 9 contains the top row of A i.e. 00011000, and so on. It can be seen that the 3 least significant bits of the address bus specifies which line of the character is required (i.e. 0-7). This is supplied by the counting/timing circuitry, as shown. The code from the RAM (on the data bus) then forms the rest of the address into the character generator (i.e. which block of 8 bytes is required).

Inspecting the PEEK/POKE codes shows that the code for a reverse field character is 128 + the normal character code. This represents the Most Significant Bit of the code. Since reverse field can be achieved by simply inverting the final video signal, it would be a waste to produce reverse field characters separately in the character

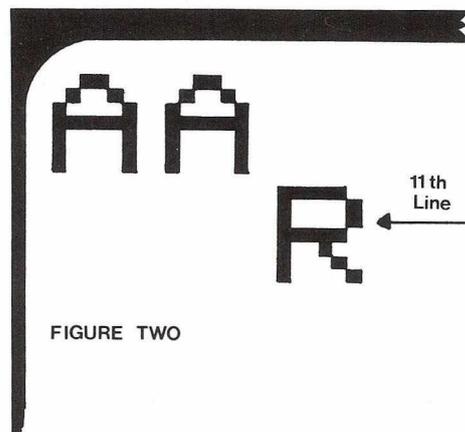


FIGURE TWO

generator. As can be seen from the diagram, the MSB of the code is "filtered off" towards a reverse field inverter.

The 10-bit address (7 from the RAM code and 3 from the counter circuit) define a byte in the character generator. The contents of this byte are sent to a Shift Register which is set to convert parallel bits to serial. The serial output, sent at a timed rate appropriate to the horizontal scan rate, is sent through the optional 'reverser' to the video line of the screen drivers.

That covers the whole process – except for the production of lower case letters. When you POKE 59468,14 you are setting a line from one of the Peripheral Chips from low to high; (peripheral chips will be covered in a later issue). This is fed into the character generator, and effectively completely swaps the set of characters. In fact this line is simply the MSB of an 11-bit address bus. The 6540 ROM contains 2K-bytes, which represents 256 characters. The lower 128 of these are for graphics mode, and the higher 128 for lower case.

This means that most of PET's character set is repeated twice in the ROM, in order that they may be used in both modes. It would thus be possible to produce an alternative ROM with one mode having ASCII plus graphics, and the other mode having 128 symbols of your own choice. These could be electronic circuit symbols or even alphabets of foreign languages!

Designing the new character generator would be easy, the problem is that producing mask-programmed ROMs, such as the 6540, is very expensive, except in large quantities. However, EPROMs such as the ubiquitous 2708 can be purchased and pre-programmed for a few pounds. Unfortunately, there is no EPROM pin-compatible with the 6540 ROM, so a 'jumper' socket would have to be designed.

If any reader has succeeded in doing this, or knows of someone who has, please write and tell us. We did hear of a PET that could write Japanese but we have not had it confirmed.

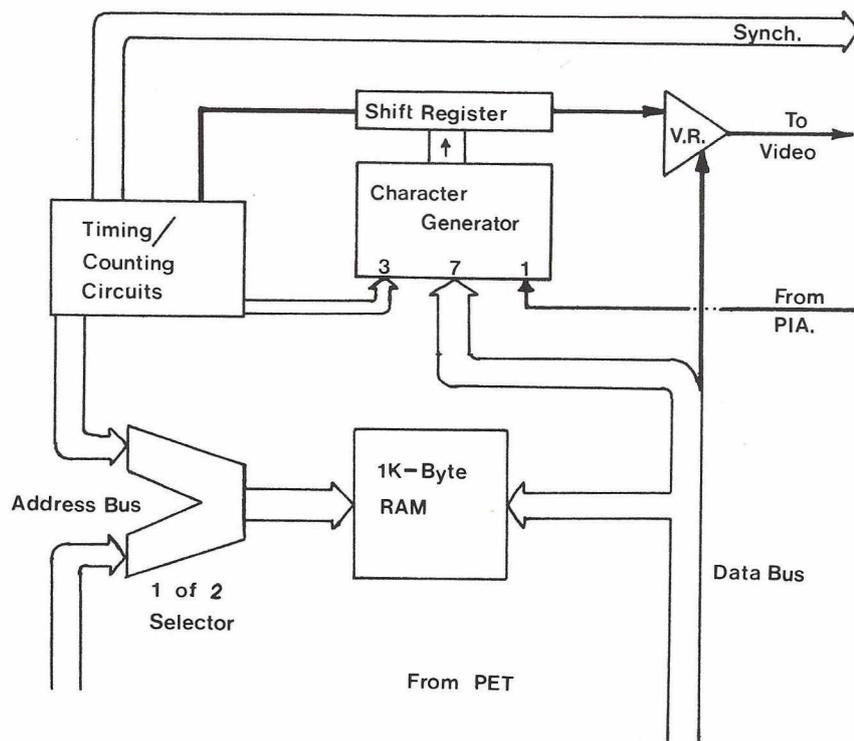
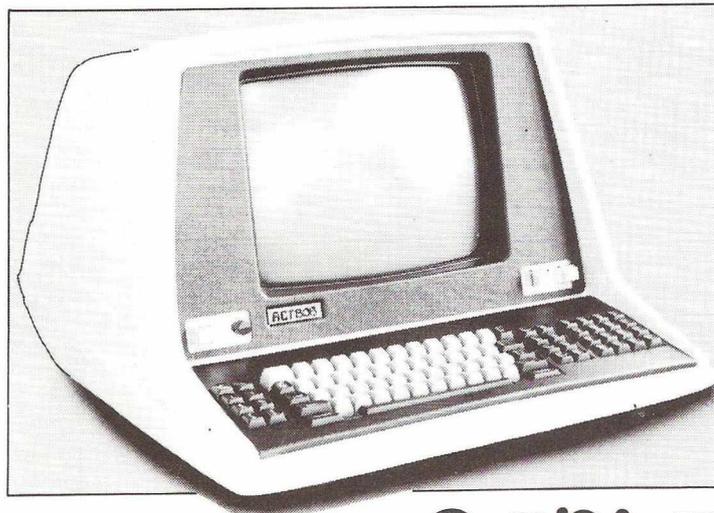


Fig. 1: Schematic of PET's video logic

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PETS AND PIECES

by
GAVIN SANDERS

On counting up to 40

I had a go last month at messy screen or printer layouts, but no apologies for returning so soon to the attack, mainly because we're in creative mode this time round! I see lots of programs each week. Mine, yours, other people's. And it's a sad fact that lots of really good programs are marred by some very poor print layout. This is mainly in the area of user-instructions, either in a separate preceding program, or included in the main program itself. Lines that are way short of the possible full 40 characters are the main problem, because it makes print very hard to read, and really untidy. I know it's a chore counting up to 40 over and over again, just to achieve a good fit for each line, but pssst! there is a quick way. Want to know more? Read on. Let's assume you've gloomily reached the bit in your program where you need a page or two of print, and you're contemplating the irritation of constantly counting, just to make it look good. Worry not; here's what you do. Type the next line number, then '?' or PRINT, then the opening '"', and then (here's the crafty bit) 40 spaces, then the closing '"', then a semi-colon, and finally enter the line

with RETURN. Now use the 'cursor up' key to move the cursor back up to the line number you just entered. Over-type the next line number, which will probably be 10 on from the first one. Hit RETURN again, and repeat the process with the next line number for as many lines as you want. The result will be a large number of lines which consist of nothing more than 40 spaces. I suspect you may now be ahead of me? List those lines (you'll find you can get 10 on the screen at one go), and simply type your instructions, or whatever, into the blank spaces. You'll know when you're at or near the end of a line, because the closing quote tells you. Thus lines get completely filled; hyphenations are obvious and easy; and the final result will look very professional indeed. Watch out for paragraphs. Because they need one coded 'cursor down' entry, the line needs to be one space longer than the others, but that's easily done with 'insert'. Cor, your programs ain't half gonna look good from now on!

Help! My back's gone again!

It seems a very long time ago now, but once upon a time a company called Commodore announced a personal, affordable, portable computer. Remember? Personal it was. Affordable too, if most of us used the word loosely, and practised winning smiles before meeting our bank managers. But portable? Well, a sort of qualified agreement to that one. Sure, it could be lifted. And carried. From here to there. Providing 'here' was right here, and 'there' was only a few feet from 'here'. But in terms of a new Olympic event ("ladies and gentlemen, what you've all been waiting for, the 5000-metre PET-carrying race"), not really. Well, I have a tip for you. Don't get too excited; it won't halve your PET's weight, nor dramatically increase the distance you can carry it. But it could make that carrying a little easier. Better still, it may even let you do fun things, like opening doors (car or ordinary), pushing lift buttons, or waving cheerily to friends, while toting your PET the while. "Heavens, how?" I hear you cry. OK, it's all in the way you carry it, but one word of caution. Go easy if you try this tip out, and be careful. If you drop your machine, you'll hate us, and we'll hate that. Right, how do most of us do it? Carry PET, that is. We reach for our machine, standing on some flat surface or other, and either curl our fingers under the white bit of the case where it meets the black under-case, or go for broke and grab it right underneath. And (puff), off we go. Wait, stop right there. Put PET down again. Now, try carrying it like this instead. As you lift it, tip it over too, either to the right or the left, whichever feels most natural and comfortable. It should finish up on its side in your grasp, with the screen flat against your stomach (which should also be flat, or you need exercise!), and the keyboard against either your right or left side, according to the way you tipped the unit. Astonishingly (and I'm no Mr Universe, believe me), you may be able to carry the thing with one hand now, at least for the few moments you'll need to

open a door, push a lift button, or wave cheerily to your now amazed friends. And if the latter demand your incredible secret, tell 'em you read it on this page!

Unexplainable corner

It's news time, folks. Though what you'll make of this one, or what use it'll be, you'll have to tell me. Having just finished entering a program, I thought I'd stick some REM statements in, like the helpful chap I am. I put four at the beginning, and then had an idea—a fifth REM of just a simple thick line to separate the other REMs from the program, and draw attention to them. I therefore typed a line number followed by REM, and then typed the thick line that's half-cursor width and is the shifted graphic on the double quote key. Looked splendid it did, and parted the REMs from the program beautifully. Utter amazement a few seconds later, however, when I listed the program. The thick line had vanished and in its place was NEWNEWNEWNEW, over and over again. Weird, but it started me experimenting. And, do you know, it happens with just about every other key too. Try it. Type a line number, then REM, then a shifted character. On screen, you'll get what you typed until you list it. Then the shifted character curiously changes to one of the BASIC commands. Why? Dunno. What use is it? Dunno again. Interesting? You betcha. But has anyone got a reason? Or better still, a use? I'll print the best replies. Two footnotes though. One, I use an 8K PET with old ROMs, so you newer guys may not get the same effect. Two, I went through 12 years in the Far East not realising that Klim, a best-selling powdered milk out there, was actually 'milk' spelt backwards; on breathlessly telling friends of my discovery, I got treated to astonished looks, and murmurs of "Didn't you know that?" Don't therefore expect to get *your* letter printed if it even *hints* that I may be the world's only hacker who was unaware of the REM-change phenomena!

Fun product

One of the nice things about this job is the press releases you get, describing near-unbelievable products. Especially if you have an imagination like mine, which an especially nasty schoolmaster once described as 'fertile'. Luckily, me Mum and Dad thought that was complimentary. They'd not met the schoolmaster. Anyway, a firm called Volumatic have come up with a shredder to beat all, believe me. *They* don't call it a shredder, and neither should I, come to think of it. No, the right word is (and it's what Volumatic call it too) a disintegrator. I kid you not when I say it'll take (hold tight—you may have some difficulty with what follows) microfilm, documents, printout tapes, cassettes and printed circuit boards, and reduce them all to a *fine powder!* The italics are mine, I hasten to add. So, if you have £17,860 and a difficult mother-in-law, the solution is now within your grasp.

End piece

I have what is so far the year's most ambiguous headline. It comes from a recent issue of 'Computing' and reads: "Siemens Laser Tests Up-End IBM, ICL Says". Wow! The mind boggles.

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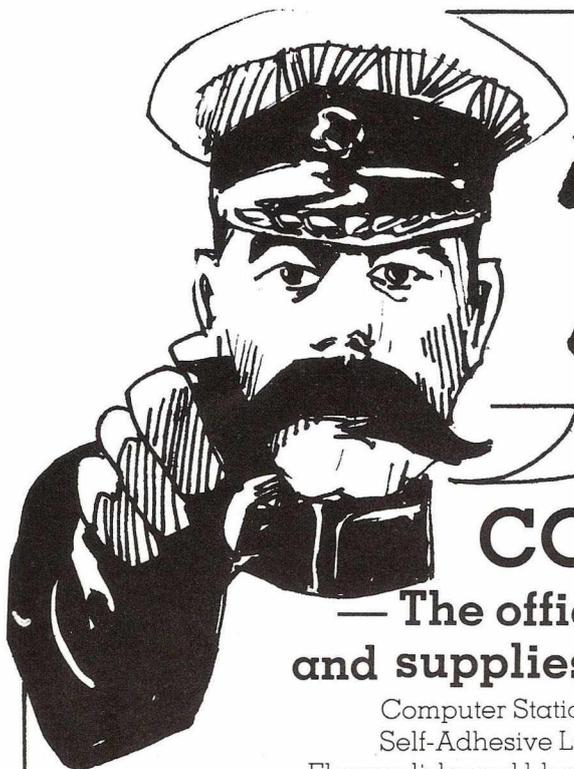
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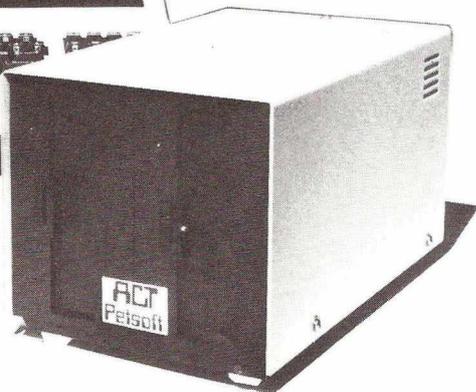
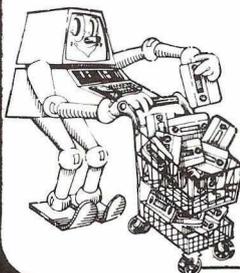
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SOFTWARE REVIEW

COMMODORE WORD PROCESSOR —WORDPRO II

Word processing is an emotive subject. If certain parties are to be believed, Word Processors give rise to excessive unemployment, job instability, mental stress and even eye-strain! Yet for all the heated discussions and negotiations, few people seem to know the true capabilities of word processors — and the limitations.

Since the PET re-appeared in its Mark II configuration, with a 'typists' keyboard and green screen, many users have been waiting for an effective PET-implementation of the word processing concept. Several low-cost packages have been on the market for some time and sold in vast quantities — notably the CMC Word Processor from Petsoft at £25. While these programs remain good value for money, they are effectively nothing more than 'an extra function for your PET' and cannot really compete with the powerful word processors discussed in the media. With the arrival of the Commodore WordPro II, we have a really definitive system and one which could provide a single justification for purchasing a PET system. In reviewing this system, we have gone into considerable detail with the operation and functions — as much to explain the usefulness of word processing as to detail this program.

WordPro II is a disk based system which enables you to prepare, compile or edit any form of document or letter, on the PET *before* committing the final copy to paper. The advantages of this over a conventional typewriter are numerous, not the least of which is the speed and ease with which mistakes can be corrected. Creating a document consists of two stages — the formation of text using the advanced editing facilities, followed by the production of a 'hard' copy on the printer — controlled by a formatting routine.

At the editor stage, text can either be entered from the keyboard into PET's RAM and hence the screen, or can be called from disk files — as a complete document or by combining numbered paragraphs to form a standard letter. PET's screen acts as a window on the working text area (which can hold up to 173 lines in RAM) with a 'status line' at the top of the screen to indicate the row and column of the cursor position plus other control parameters. Live editing is carried out on this window of text. PET is well known for its comprehensive editing facilities, but WordPro II takes them even further with repeat keys, fast cursor movements and scrolling (up as well as down). In addition many functions can be executed at a variety of levels; for example characters or lines can be instantly inserted, characters, lines, blocks or pages can be erased at a single command. These functions provide conventional screen editing — only more so.

Where WordPro II comes into its own is with the dedicated text handling functions, which have, on the whole, been designed specifically with the business user in mind.

We have already mentioned that standard paragraphs may be instantly referenced by number and inserted into your document in any desired position. Paragraphs that you have just written can be saved on disk, or moved to any other position with a single command, thus facilitating the creating of standard letters. The latter are evidently deemed to be the most common application for WordPro and are catered for with two powerful variable entry functions.

The first is a variable data block handler, enabling the production of several standard letters with different entries in set places. Such a letter might look like this: (B) is a variable data block.

Dear (B)

Thank you for your order of (B). We estimate that this will be shipped on (B) and will invoice you from that date.

Yours sincerely, THE MANAGEMENT

Entered into another text area are the variables to be inserted, for example:

Mr Smith, 100 Widgets, 10/3/80

Mr Jones, 15 items, 7/1/80

which would result in two letters being printed — each reading like an original. Secondly, there is a FIND function which will indicate the location of all occurrences of a requested word or phrase. This is particularly useful for changing a standard phrase in a stored letter, for example — the name of a product or price. One criticism here is that the FIND function will not automatically change the entries to a new phrase — you have to enter each one individually. Several other minor functions exist for the convenience of the typist — title centering, automatic tabulation, changing blocks of upper case to lower case, shift lock etc.

Having created the final text a formatting routine takes over to print copies (as many as desired) on the printer. Two versions are supplied to handle the Commodore printer or a high quality daisy wheel mechanism such as a Qume or Diablo. While the former would be adequate for internal memos or invoices, the latter is really dictated for use on business letters. Although this would add another £1,500 to the cost of your system, the end result is a word processor comparing very favourably with a dedicated system costing several thousand pounds more.

To return to the formatter, any line-length can be specified (note that text is stored in RAM in a line-free form) along with the left and right margin widths, and the line spacing. Perhaps the most visually appealing feature of WordPro is the optional right justification on output. For this, all text lines are straightened up, on the right and left margins (as in our columns) by means of 'sharing out' extra spaces amongst the words of a line. Purists might argue that this routine is unintelligent — it always gives equal spacing to each word, but the effect is very presentable. Provision is made for indicating possible break-points in very long

words during editing to prevent incorrect splitting of a word. This is a useful feature, often forgotten on word processors, though we doubt if most users will bother to keep indicating the break-points.

In conclusion then, WordPro is a very powerful package which has been written with the user very much in mind. If you want to venture into the field of word processing, this system does justify the name and can quickly be put to efficient use. We found PETs 40 column screen slightly annoying, but it does not in any way limit the capabilities. Our verdict: at £75 WordPro represents extremely good value for money. If you want it for business letters, however, you will need a high quality printer. Ironically, with this kind of software, PET is being brought right into arguments regarding the installation of computers — previously applicable only to larger machines.

NOTE: A new package called 'Wordcraft', claimed to be the most powerful PET word processor yet, has recently gone on sale. Running on both Commodore and Petsoft/Compu/Think disk systems, it is available through Datalink of Colchester and Petsoft. We shall be evaluating it in a forthcoming issue.

PEEKs and POKEs by Inside Trader Gossip Rumours and other distortions

Commodore shareholders with nerves of steel made a packet last year. The share price zigzagged between the high teens and low forties. 1980 looks exciting too US software superman Robert Elliot Purser reports that there are now more PETs being sold in London than on the entire West Coast New world recantation record set by the Datalink correspondent who dared to question North London Hobby Club Guru Barry Miles' PET expertise. He should have known better than to tangle with the Holloway Hellion Watch Curry's shares this spring. Ex-CBM PET supremo Robert Webb plans to put micros in every High Street True telephone conversation: *PRINTOUT*: "May we speak to Kit Spencer?" *Commodore Switchboard*: "Who?" IPUG President Pete Dowson speaks so fast that few members can understand him. In moments of excitement he slips into binary Get Well Soon greetings to PET User Notes Editor, Andrew Goltz. Yes — he slipped a disk We were sorry to miss ACTs recent brains trust for top computer journalists. Most of the editors still aren't on speaking terms Why no PET modem yet? Look no further than GPO HQ. However Sir Sheath has them on *his list* Now that the newspaper industry is dying on its feet without even having tried micros, where are editors to cut their journalistic teeth? Not inappropriately, the micro processor industry is providing a training ground: Terry Laudereau, Rick Simpson, Greg Yob and even *PRINTOUT*'s Pater Familias all started at Commodore

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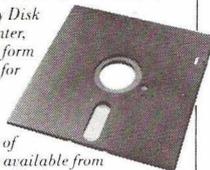
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MODULAR PROGRAMMING

Modular programming is one of a number of alternative approaches to writing software. Although the method is well established amongst Computer Scientists and software specialists, the PET has not lent itself readily to its implementation. MPAK is a 'Modules Package' that facilitates the writing of top-down modularized programs. Modules may be written, named and run individually, and finally linked into a working program. A renumbering routine is provided within MPAK for greater flexibility.

Directions

First load MPAK before beginning to enter your program into the keyboard.

Write your program on paper first, dividing programming tasks into logical modules as suggested by 'Structured Software for Personal Computing' (Salisbury, CREATIVE COMPUTING, MAR/APR 78, p. 58) and others. Try to follow these constraints:

1. Write your modules so there are no more than 20 lines to a module.

2. The first line number of the module should be of the form:

M
DD00 where $10 \leq M \leq 99$ and M is even

We will refer to M as the *module number*. Thus, for a module number of $M=32$, we know the module begins at line 3200. We will also call the first line of a module the *lower bound* of that module.

The *upper bound* of the module is the *lower bound*+199. Thus, for $M=32$, the module line numbers must fall in the range of 3200 to 3399.

```

0 GOTO60000
7 PRINT"DIREC PG1":LIST700-799
8 PRINT"DIREC PG2":LIST800-899
707 REM: 7 DIREC PG1
708 REM: 8 DIREC PG2
709 REM: -----
749 REM: -----
1000 PRINT"HERB"
1010 RETURN
60000 CLR:INPUT"CMD";C$:C=ASC(C$):C=-((C=65)-2*(C=68)-3*(C=82)-4*(C=83))
60040 INPUT"MOD#";M:Q=M*100:R=Q+199:S=10:T=Q:DIHL(25):U=700+M-100*(M>59)
60050 ONCOSUB60300,60200,60250,60350:GOTO60000
60200 GOSUB63000:PRINT"":PRINTM:PRINTU:IFL(1)>RTHEN60360
60210 FORI=1TOA:PRINTL(I):NEXTI:GOTO60360
60250 GOSUB63000:IFFNL(A)>=XTHENPRINT"OVER":RETURN
60260 N=L0:FORB=1TOA:GOSUB63200:GOSUB63400:NEXTB:RETURN
60300 INPUT"NAME";N$:PRINT""
60310 PRINTM;TAB(5);"PRINT";CHR$(34);" ";CHR$(34);":LIST";Q;"";-R
60320 PRINT"";TAB(11);"S";N$:PRINTU;"REM:";M;N$:GOTO60360
60350 PRINT"":FORI=QTORSTEPS:PRINTI:NEXTI
60360 PRINT"HIT RETURNS";:END
63000 DEFFNR(X)=PEEK(X)+256*PEEK(X+1):DEFFNL(X)=S*(X-1)+T:N=1025
63010 DEFFNH(X)=INT(FNL(X)/256)
63030 L=N:N=FNR(L):X=FNR(L+2):L0=L:IFX<QTHEN63030
63060 A=A+1:L(A)=X:L=N:N=FNR(L):X=FNR(L+2):IFX<RTHEN63060
63090 N=L0:RETURN
63200 L=N:N=FNR(L):POKE(L+3),FNM(B):POKE(L+2),FNL(B)-256*FNM(B):RETURN
63400 FORC=L+4TON-1:P=PEEK(C):IFP=137ORP=141ORP=167THENF=1:GOTO63540
63420 IFF=0ORP=32ORP=96GOTO63540
63430 IFP<48ORP>57THEN63450
63440 D=10*D+P-48:G=G+1:GOTO63540
63450 IFG=0THEN63530
63460 FORE=1TOA:IFD=L(E)THEN63480
63470 NEXTE:GOTO63530
63480 E$=STR$(FNL(E))+"" :H=LEN(E$)-4:C=C-G:IFH>GTHENC=C-1:G=H
63490 FORI=1TOG:POKEC,ASC(MID$(E$,I+1,1)):C=C+1:NEXTI
63530 D=0:G=0:F=0
63540 NEXTC:RETURN

```

3. Attempt also to have only one entrance to a module (at the top) and one exit (at the bottom). This is not only a convention of good structured programming, but will be very helpful should you have to renumber a module. MPAK's renumbering option affects only the line numbers of a given module and not the line numbers of other modules that may be referring to the renumbered module. If all external references to the renumbered module are to the entrance point at the top of the module, then everything will take care of itself.

After you have your program modules defined and written, enter them into the PET by first using the "ADD" command. The following is a sample interaction of how to do this (underlining during interactions indicates operator response):

```

RUN
CMD? A (for "ADD" module)
MOD ? 30
NAME? TESTER4 (up to 9 characters
are standardly allowed for a module
name, but this standard may be altered)

```

At this point the screen clears and some information appears with a request to "HIT RETURNS" at the top of the screen. Do so until all lines on the screen have been entered. You have now allowed the listing of a module named "TESTER4" in the range of line numbers 3000-3199. You have also added this module name and number to the first page of the directory.

To see the first page of the directory, type: RUN7. Notice that the name of your new module, TESTER4, and its number (30) have been added to the proper position of the directory.

LISTING OF MPAK

First printed in the PET
User Group Newsletter,
Berkeley, California

Now enter the actual statements for the module "TESTER4". For example:

```

3000 DIM X(20)
3005 FOR I=1 TO 20
3015 READ X(I): GOTO 3019
3019 IF X(I)=-1 THEN 3120
3020 PRINT X(I);
3030 NEXT I
3040 PRINT
3050 REM—GOTO 3120 IN A
REMARK SHOULD BE
IGNORED
3070 GOSUB 4200
3080 IF X=3120 PRINT "DON'T
RENUMBER THIS, EITHER"
3120 REM: JUMP TO HERE
3133 PRINT "END OF DATA"
3140 STOP
3157 DATA 3,5,7,8,-1

```

This example doesn't do much, but it will be instructive if we wish to exercise the renumber command later.

To display this module, with its name at the top, simply type RUN30.

If you wish to have the line numbers for a module printed on the screen before you enter the actual statements, you may do so with the following interaction:

```

RUN
CMD? S (For "SET" module line
numbers)
MOD ? 30

```

The screen will clear and fill with line numbers 3000 to 3190 in steps of 10. Only the line numbers that you enter statements for and hit returns for will be entered into the PET.

Again, after you have entered a module into the PET you may list it by typing

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RUNM where M is the module number.

Remember that you must add each module by going through the MPAK "ADD" routine first, however.

Let's talk a moment more about the Directory. Performing the MPAK "ADD" routine adds our module name and number to one of two pages of a directory. If $M \leq 59$, the module will be added to the first page of the directory. $M > 59$ causes the module to be listed on the second page of the directory.

Type:

RUN7 to see page 1 of the Directory

RUN8 to see page 2 of the Directory

The Directory boundaries can be easily changed by altering ($M > 59$) in line 60040 to another desired value.

Continue adding modules in the fashion described. Your directory will grow with each "ADD" entry.

Should you wish to delete a module at any time, type:

RUN

CMD? D (for "DELETE" module)

MOD ? M (where M=the module number)

The screen will blank and line numbers will appear. Hit the return key until all line numbers have entered. This procedure will also delete the module from the directory and remove that module's listing capability via the RUNM feature.

Should you wish to renumber a module, type:

RUN

CMD? R (for "RENUMBER" module)

MOD ? M (where M=the module number)

A delay will occur at this point while MPAK renumbers the lines of the desired module. (This delay may be up to a minute because the renumbering is being done in BASIC to allow easier operator use and potential modification.) When the designated module has been renumbered, the "CMD" prompt will return. To verify that the module has been renumbered, type "return" and RUNM.

For instance, to renumber and display our TESTER4 module, the following interaction should take place:

RUN

CMD? R

MOD ? 30

(delay)

CMD?

READY.

RUN30

Notice that all module line numbers are renumbered from the lower bound of the module in steps of 10. If different step size is desired, change the value of S in line 60040 to the new step size.

When all modules have been entered, you may execute your program by typing RUN XXXX where XXXX is the starting line number of your program, or you may change line 0 to read GOTO XXXX rather than GOTO 60000. Since this last action will make it harder to run MPAK, however, it is advisable to use the first method until you are assured that your program will require no further modifications.

BASIC ROM ADDRESSES

By Robert Wind

Compiled by Robert Wind, the tables below list the addresses where the BASIC routines reside. They form a useful basis for users wishing to evaluate functions in machine code.

"The addresses are stored as pairs of bytes (low-order byte first, then high-order byte) in two tables at ROM locations 49152 through 49267.

The first table lists the routine address minus one, and the second table lists the routine address exactly. I believe the list is accurate, but I haven't thoroughly checked out all the routines. Note: In my PET these addresses appear to be 00 when PEEKed. However, by transferring these locations to

A few additional notes about MPAK

1. I tried to keep memory usage by MPAK to a minimum since this should be just the underpinning to longer programs.

2. The number of allowable characters in a module name may be altered by changing the number of spaces in the PRINT statement in line 60210. Longer allowable module names will take up more memory even if the full name sizes are not used.

3. In a truly memory-tight environment, a little space may be saved in the directory by altering line 60320 so that the "REM: ";M is removed.

This will take out the "REM: M" occurrences in the directory. The module numbers are still embedded in the directory line numbers. Note: this leads to non-executable code, but the PET will still list it.

4. MPAK uses a pretty general renumbering routine with parameters Q,R,S,T where

Q=old line number beginning

R=old line number finish

S=step size

T=new line number beginning

This routine may be adapted to other purposes with different driver programs. Please note that the routine may get into trouble trying to replace old line numbers of N digits by line numbers with N+1 digits or more. In our MPAK applications this was not a problem since all line numbers within a module had the same number of digits. Also, the dimension size of L() will have to be increased for larger renumbering bounds.

5. MPAK routines reside in the upper part of memory and should not be used to modify themselves. (The renumbering routine in fact will check and prevent attempted renumbering of itself.) Also, line numbers 0 to 640 are reserved for possible module listing commands.

6. A third page of the directory could fit in as module 9, but no particular preparations have been made for this. It is not hard to implement, but rarely necessary.

RAM with a machine language program, the location in RAM can be PEEKed to observe these tables."

Table 1

Routine	Address	Basic
Hex	Decimal	Command
C551	50513	NEW
C5A8	50600	LIST
C649	50761	FOR
C70D	50957	RESTORE
C71C	50972	STOP
C71E	50974	END
C745	51013	CONT
C770	51056	CLR
C775	51061	RUN
C780	51072	GOSUB
C79D	51101	GOTO
C7CA	51146	RETURN
C7F0	51184	DATA
C800	51232	IF
C833	51251	REM
C843	51267	ON
C89D	51357	LET
C97F	51583	PRINT #
C985	51589	CMD
C99F	51615	PRINT
CA9F	51871	GET
CAC6	51910	INPUT #
CAE0	51936	INPUT
CB24	52004	READ
CC36	52278	NEXT
CF71	53105	DIM
D295	53909	DEF
D6F9	55033	POKE
D702	55042	WAIT
FFC0	65472	OPEN
FFC3	65475	CLOSE
FFD5	65493	LOAD
FFD8	65496	SAVE
FFDB	65499	VERIFY
FFDE	65502	SYS

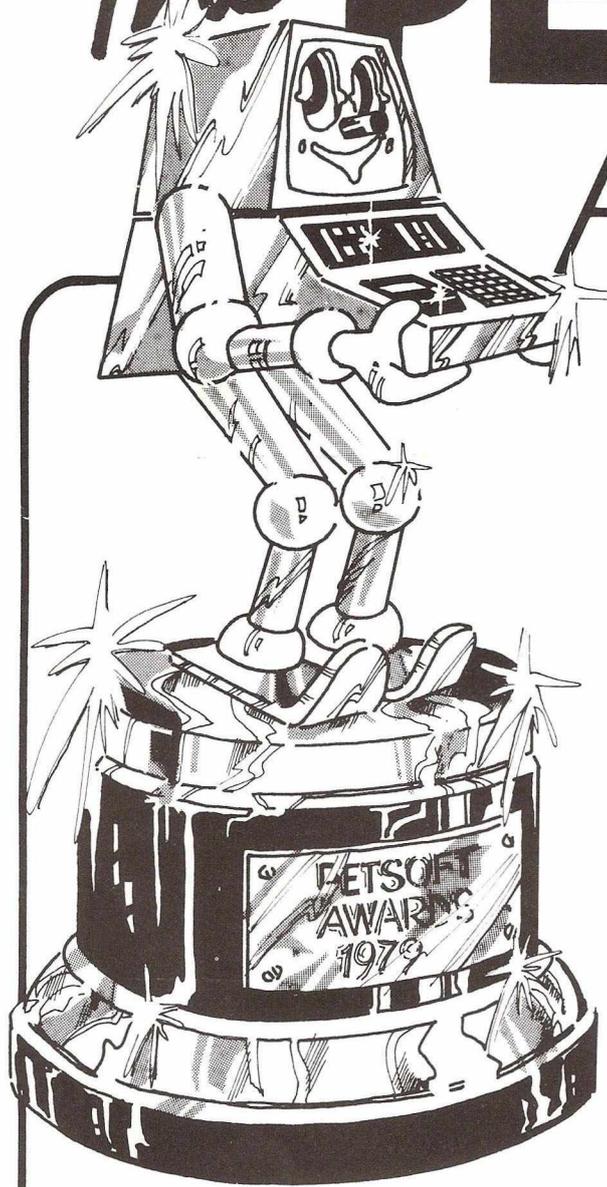
Table 2

Routine	Address	Basic
Hex	Decimal	Command
0000	0	USR
D264	53860	FRE
D285	53893	POS
D349	54089	STR\$
D5C4	54724	CHR\$
D5D8	54744	LEFT\$
D604	54788	RIGHT\$
D60F	54799	MID\$
D654	54868	LEN
D663	54883	ASC
D685	54917	VAL
D6E6	55014	PEEK
D8BF	55487	LOG
DB0B	56077	SGN
DB2A	56106	ABS
DB9E	56222	INT
DE24	56868	SQR
DEA0	56992	EXP
DF45	57157	RND
DF9E	57246	COS
DFA5	57253	SIN
DFEE	57326	TAN
E048	57416	ATN

Robert H. Wind

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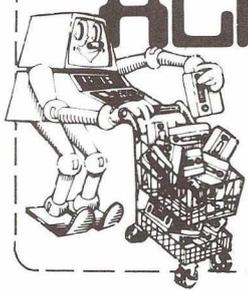
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