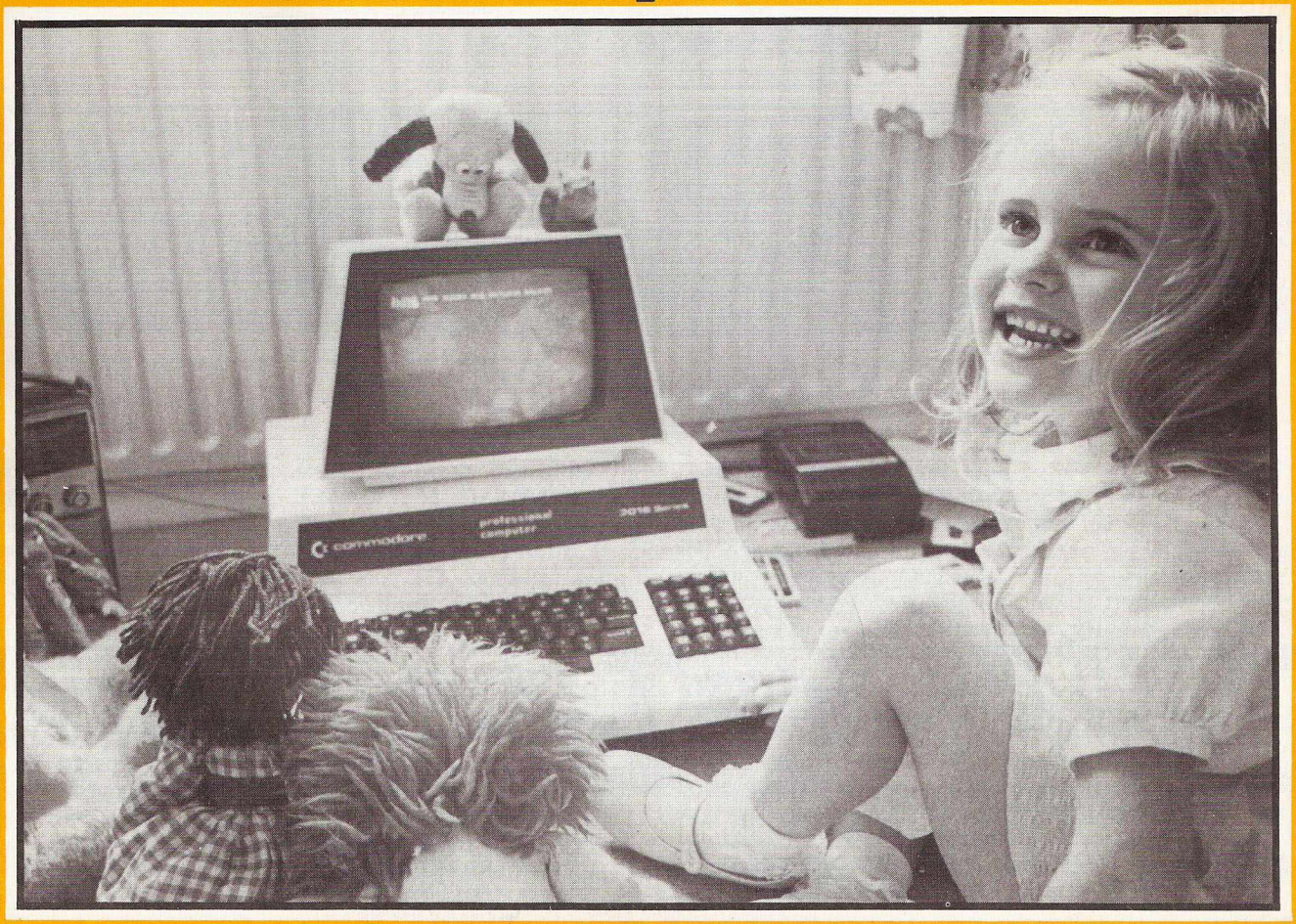
MICROCOMPUTER

SPECIAL SOFTWARE ISSUE

PRINTOUT

All about the PET Computer

CHILDS PLAY
The PET computer at home



Word-Pro: The program, the people and the problems.

October 1980 95p

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Editorial

It scarcely seems possible (to me anyway!) that this is my fourth editorial. Time rushes past, with only the briefest of pauses between successive issues of PRINTOUT. But, of course, that's the way it should be in the publishing world. If it weren't, we'd get a little nervous!

And nervous is what we are not! This issue sees yet more changes to make PRINTOUT what you want, and to match our rapidly expanding circulation,

First, again more pages, keeping our promise to enlarge steadily, along a predetermined plan, until (and even, perhaps, beyond) the point where we will match page-count with our respected contemporaries. As you'll know, they don't specialize on a single computer, or grouping of computers. You may have experienced the result: a quick scan through, when the latest copy arrives, to see how much there might be for our particular interests. It's nice to know (or we hope so, for that's the intent) that PRINTOUT will always contain material which is, at the very least, relevant to all our readers.

Second, with this issue, there's our new two-column layout. We've chosen it to make the magazine more instantly readable, as well as more attractive. It also has the big advantage of letting us reproduce computer listings in very nearly their original size. And since you will find listings — very short, short, medium, long, and sometimes very long — appearing more and more often, readability is important.

Third, and again with this issue, there's the introduction of two types of software, firmware or hardware review. Major, (and often costly) items will get more than a simple review: you'll have the most complete profile we can mangae. After all, you may buy, so you have a right to as much as we can tell you. This issue has two profiles: the new firmware Superchip; and Petaid, a do-it-yourself database. Shorter reviews will continue, of course, where we can adequately cover an item in less space.

For the future, we are already starting to work on your January issue (I said it was all go in publishing). We think the theme should be firmware/software: those extra ROMs, or cassette/disk programs which considerably enhance your machine's performance and capabilities. We've come a long way from the first to appear: the now legendary Toolkit, still going strong. Now there are newcomers which need testing, evaluating and describing. Look to us to do it.

Can I finish with an aphorism you might find attractive, even if you leave your computing interests in the office when you go home (but which of us really does)? Its simply this:

WHAT SHALL WE DO FOR A HOBBY, NOW WE'VE FOUND AN OBSESSION ?

Terry Hope

KINGSTON

KINGSTON — KRK 1

A hardware repeat key for the PET number/cursor pad — a boon to the busy programmer and the ambitious games programme writer. Aided by the detailed instruction programme the average PET owner can upgrade his machine in a couple of minutes without fear of a fatal 'no-no'. **£17.50**

KINGSTON — KRK 2

Initially the KRK 2 was conceived as a definitive full keyboard repeat key. However, Kingston ingenuity has optimized on their patented board accessing techniques to allow two invaluable features to be added:

The first, a warm keyboard reset from otherwise fatal crashes. The second, a selectable keyboard tone which allows touch entry at otherwise impossible speeds. We can say with confidence that this unit is an absolute must for any PET user who wants to get the best from his machine. **£35.00**

KINGSTON — KC 1

A totally new concept in PET's communication with the outside world. At long last the programmer is free from the limitations of the IEEE bus. INPUT, PRINT, LOAD and SAVE to an external RS232 device are now possible without recourse to ingenious/tedious software. A comprehensive on-board firmware package allows all manner of hitherto impossible functions to be achieved including keyboard selectable configuration with full modem control. **£135.00**

KINGSTON — KC 2

Having achieved one level of impossibilities, we knew someone would need more so here it is —

Simultaneous access to two RS232 serial devices or networks with all the features of the KC 1 and more besides. With this device we give PET users serial RS232 I/O capabilities, which the owners of much more expensive machines would envy. **£150.00**

KINGSTON — KSB 1

A twenty-way RS232 multiplexing/switching box with 'mind-blowing' potential — Applications of the unit are legion and range from simple networking through multiple disc sharing to multidevice complexes based on a single processor. **£350.00**

CMC ADA 1200

A low budget IEEE 488/RS232 unidirectional interface, with a proven record of reliability (Field failure rate better than ·1 percent). Since the unit is not addressable it is not recommended for use with the Commodore Disc. **£65.00**

CMC ADA 1400

An addressable IEEE 488/RS232 unidirectional interface, which is proving even more reliable than the ADA 1200 from which it was developed. While it was designed to offer only standard RS232 output it is sufficiently 'beefy' to cope with a number of less demanding current loop applications without modification. **£90.00**

CMC SADI

SADI — The microprocessor based serial and parallel interface for the Commodore PET. SADI allows you to connect your PET to parallel and serial printers, CRT's, modems, acoustic couplers, hard copy terminals and other computers. The serial and parallel ports are independent allowing the PET to communicate with both peripheral devices simultaneously or one at a time. In addition, the RS232 device can communicate with the parallel device. Special features for the PET interface include:

- Conversion to true ASCII both in and out.
- Cursor controls and function characters specially printed.
- Selectable reversal of upper and lower case.
- PET IEEE connector for daisy chaining.
- Addressable — works with other devices.

Special features for the serial interface include:

- Baud rate selectable from 75 to 192000.
- Half a full duplex.
- 32 character buffer.
- X-ON, X-OFF automatically sent.
- Selectable carriage return delay.

Special features for the parallel interface include:

- Data Strobe — either polarity.
- Device ready — either polarity.

Complete with power supply, PET IEEE cable, RS232 connector, parallel port connector and case. **£175.00**

CMC AIM 161

A low budget IEEE 488 16-channel analogue to digital convertor for the competent programmer who wants to 'do his own thing', With a 5·12 volt reference voltage the unit is normally accurate to better than ·5%. **£90.00**

CMC PETSET

An AIM 161 specially configured for plug-in and switch-on use by the less technically graced user. The unit has a number of helpful extras including an input connector board allowing simple screw connection to the outside world. **£135.00**

CMC APPLESET

Similar to the PETSET, saving that the unit is configured for use with the APPLE. **£135.00**

CMC TANDYSET

Similar to the PETSET saving that the unit is configured for the TANDY TRS80. **£135.00**

CMC XPANDR 1

Analogue to digital conversion of up to 128 channels can be achieved by simply connecting as many 16-channel AIM 161 units as you need through this smart board. **£40.00**

TNW Corporation

TNW 2000

With over 2,000 units sold, this IEEE 488/RS232 interface can truly be said to be tried and tested. Features include the conversion of both PET and true ASCII, daisy chaining and full address selection.

Standard RS232. **£135.00**
Current Loop. **£150.00**

TNW 3000

A bi-ported, bi-directional IEEE 488/RS232 interface offering everything the discriminating programmer could ask for. Features include independent crystal controlled Baud rate on both ports and fully implemented RS232 with extensive control line options allowing responsive throttling. **£220.00**

SSM

SSM — A10

Two powerful APPLE interface boards in one:

The first an RS232 serial with three handshaking lines (RTS, CTS and DCD), rotary switch selection of nine standard baud rates from 110 to 19200, including 134·5 for selectrics and the modes of serial communication under software control.

The second a double bi-directional parallel with four additional interrupt and handshaking lines, and interface configuration under software control. **£105.00**

NOTES

1. Every Kingston product is carefully burned in and tested before dispatch.
2. Kingston's guarantee, warrantee and service undertakings are probably the best in the business — If you would like to see what real customer concern is all about, then send for a copy of our standard Guarantee Form!
3. All prices quoted by Kingston are inclusive of packaging and shipping, but do not include V.A.T. — Please add 15% V.A.T. to any order.
4. We have a number of new and exciting products 'in the pipeline' including:
   (a) A family of rugged, low budget EPROM programmers and duplicators.
   (b) A number of new cost effective printers, including daisywheels and single and double pass (better quality) matrix.
   (c) A low cost TRS expansion.
   (d) A flexible/expandable industrial control system.
   (e) Emergency standby power units, ranging from a ·5 KVA baby to a 9·5 KVA mainline system.

If you have an interest in any of these items, give us a call. As you might expect from a company which prides itself in being different, we maintain an engineer on call eighteen hours a day, seven days a week to help you.

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Scarborough House, Scarborough Road, Bridlington. Telephone 0262 73036


NOW THEY TELL ME!
KINGSTON CHRONICLE
~~KINGSTON~~ KINGSTON PERIPHERALS MAKE MICROS' MIGHTY MICE!

READ/WRITE ... the pages where you have YOUR say!

POKE ABOUT A BIT

On looking through the August PRINTOUT, I read one of "Tommy's Tips" which described how to protect a file on a CompuThink disk drive from being listed. I can't make it work. Is there something missing, like POKE 1034,42 or is it the fact that I only have a single-density disk drive? One other point on CompuThink drives. As Newton Don said back in your May issue, "you can get left with the drives whizzing round". The fix is SYS 45095, which is the routine which stops the drives. I use this in a subroutine (see below), for reading from disks. If you ask for a file that isn't on the disk, it jumps to Line 23500, and that stops the motor.

```
23000 REM DISK DATA READING SUBROUTINE
23120 POKE44976,40
23140 $O,D,"R",F$,I$
23160 IFPEEK(44976)=255THEN23500
23180 PRINTF$" - FOUND"
23200 REM INSERT THE VARIABLES TO BE
23300 REM
23399 REM READ BETWEEN THESE POINTS.
23400 $C
23420 RETURN
23500 SYS45095
23520 PRINTF$" IS NOT ON THIS DISK!"
23540 RETURN
```

Michael Peak
Staithe Road
Barton Turf
Norwich

You'll have heard directly from Tommy by now, Michael, so you should be out of trouble. For others who might have had a problem, Tommy says that single-density is indeed at the bottom of it all. The answer's POKE 6,100 though. This will give the same protection to single-density disks as the POKE featured in Tommy's August column. Thanks for the routine, Michael; there's not a more horrible situation than whizzing drives you can't stop!

UPPER VERSUS LOWER

John Still complains about the way Petsoft converted his instructions from lower-case to capitals, when he submitted his program to them. Maybe this was because capitals are more readable on the screen? I certainly find them so. Lindsay Doyle said in one of his "Style" articles that PET's screen uses an 8 by 8 matrix, which only leaves a single row of dots between text lines. Capitals therefore need a blank line between them if they're to be readable, and I think that's so for lower case too. Commodore do seem to have got themselves in a complete mess with their printer font. Its matrix is 7 by 5, and that marries so badly with the 8 by 8 of the screen that the leading edges of some reverse-field characters are completely lost. Wandering round a recent word-processing exhibition, I noticed that characters on all the other printers were much easier to read. This leads me to think it would be possible to design a better character set for the PET printer. Is is possible to program actual letters? I'd be interested.

Will Ogilvy
Caputh, Murthley
Perthshire

Will, we're diametrically opposed on screen text. Sentence after sentence in capitals looks downright dreadful. We've seen Petsoft's John Still program. What they did was "flip" the text to match the new ROM set. Of course capitals on screen need blank lines between them (which is space-wasting), but lower-case doesn't because almost all the letters have more than the single row of dots between them. The only time they don't is where a "b", "d" or other letter with a "riser" occurs (there are only 7 of them). And, of course, lower-case looks more natural. You're right about the Commodore printer - we've heard the marriage between screen and print-out described as a love affair between a Great Dane and a Pekinese. Other printers that aren't even that much more costly have true "descenders" on "g", "p" and so on. It's perfectly possible to program alphabetic characters, and we have a program that'll print descenders on the CBM printer. The only trouble is the time it takes to print anything out. Each line of print-out has to be redone for every different "descender"! There's only one thing for it — start saving up for a better printer!

MOVING THE CURSOR

Here are two ways (one for old ROMs; one for new) of immediately positioning the cursor anywhere on the screen (X is the row you want from 0 to 24, and Y is the column from 0 to 39).

```
OLD ROMS CURSOR MOVE
POKE226,X:POKE245,Y:SYS58843

NEW ROMS CURSOR MOVE
POKE198,X:POKE216,Y:SYS57949
```

I've only just caught up with Gavin Sander's request for trophy suggestions, when Petsoft sell their 100,000th program. How about a gold PET to load the gold cassette on? Or a gold cassette that actually loads? Or even a copy of Peter Jennings' Microchess 2.0 that has no bugs in it?

Duncan Batey (13)
Blvd Joseph Ricord
06140 Vence
France

Thanks for the cursor positioning routine, Duncan. It's smart and, even better, useful. And thanks for the one-liners on Gavin's way-back competition. Who writes your scripts? Seriously, we've not actually come across any bugs in the otherwise controversial but best-selling Microchess. What have you found?

PRINTER PROBLEMS

I've got a Commodore printer and I agree with Martin Jacobs' comments a few issues back about it. Problems can arise with the new 04 ROM printers which seem to insist on printing in lower-case if the output is formatted. The paging also seems to be 68 lines instead of 66, so you have to pull the paper down after each page. You can tell which ROM you've got by pressing the "Feed" button, and keeping it pressed. If the paper goes up a few lines and stops, you've got the old ROM. If the paper keeps on going, then you have the new one. Commodore are said to be putting the bugs right, but maybe they'd like to comment? Referring to Gavin Sanders' tip about the "less than" key to check whether there's anything on a tape, why not use VERIFY instead? That way you get to see what's on the tape without affecting what's in memory. The best is a qualified VERIFY (I'm a Dylan Thomas fan, so I use VERIFY "LLAREGGUB"!). This lists every program on the tape and leaves whatever's in PET untouched. Finally, to abort any direct command you suddenly don't want, without clearing the screen or using the Delete key, hold both Shift keys down, and press "Z". The cursor jumps to the start of the next line, so you can either enter a new command, or edit the previous one.

Continued on page 9

READ/WRITE Continued.....

Roland Bourne
Penarth Gardens
Sherwood Vale
Nottingham

Thanks for the parcel of tips,
Roland. Gavin's "less than" suggestion was more in the nature of illuminating a PET peculiarity, rather than the total solution to an otherwise irresolvable problem. Your VERIFY is clearly better. What's your "LLAREGGUB" program all about then? Do send a listing if you think we could get away with printing it. On your "both-shift-keys-and-Z" suggestion, Gavin says why not simply move the cursor down to a blank line with the Cursor Down key? He also says "one-all!"

A LADY AT LAST!

Before I get to the point of my letter, can I just say (because some considerable attention seems to have been given to this point) that I'm a lady PET owner? In fact, I want to extend my 3032 PET with a disk drive and a printer, but my problem seems to be what drive and what printer? I've read your articles on CompuThink and Commodore, but I'm not much wiser. How about a comparison chart with ratings, so that intelligent decisions can be made? Everyone says what their products will do, but how many say what they won't? The same goes for printers. I'm short of space, so I want a small one, but I'd like it to be reliable too. So far I've come up with the Microline 80, which costs a bit more but seems to have points in its favour: twice the character head life; no duty cycle limitations; paper handling flexibility; and it's small. But it's not "bi-directional". What's that, and will I miss it? Buying a printer also seems to extend the problem somewhat - to interfaces! I wrote to, and have since spoken on the phone with, a very helpful gentleman from Bright Electronics. He said that if I bought an addressable interface now, I wouldn't be able to run my printer on it without an additional adapter or, as I understood it, the connecting cable for the disk drive, failing the prior purchase of a disk drive. Odd titbits of information keep cropping up with such regularity that I don't think I'll be sure any purchase was wise! For instance, I have Petsoft's LINK program but I've recently been thinking about a Toolkit, which will make my LINK Program obsolete. But now I read that Toolkit won't work with CompuThink disk drives without the addition of a special switch. Perhaps it's as well I haven't got a Toolkit yet? I also have a Petsoft Soundbox, which goes inside on the second cassette port. Again though, I now hear there's a much better version which goes outside PET, on the user port. Where on earth does one turn in this jungle?

Mrs L F Dickinson
Jenkins Lane
Leverton
Near Boston
Lincolnshire

My, what a catalogue! But welcome aboard, Mrs Dickinson; you're among friends. First, you need to meet users who've had your problems and learnt the hard way. Contact Eric Booth at Bishop Grossetest College, Newport in Lincolnshire. He runs your nearest micro society, and can put you in touch with PET owners close to you. On disk drives, we'll be looking at Commodore and CompuThink in our issue cover-dated January, out in December. If you can't wait, Commodore's drive may be your best bet. Why? Because it was designed to go with PET; is better supported by available software; now has most of its bugs smoothed away; has new software, developed by clever people, frequently announced which further reduces its drawbacks - BB Computers new DOS (Disk Operating System) is the latest; is cheaper on a simple cash basis; and is likely to become the de facto PET standard. CompuThink is very good indeed; somewhat more expensive (but not on a storage byte for byte basis); and would be the obvious best buy for a business developing its own software, especially needing fast disk random access facilities. This doesn't sound like you though. Commodore's disk unit won't get in the way of Toolkit, but CompuThink and Toolkit together can be a pain. Would-be Toolkit users with CompuThink drives will tell you why. More on Toolkit in a moment. On printers, our December issue, out in November, will have a comprehensive analysis on what's available. "Bi-directional" can mean several things, but in your context it's probably a printer's ability to print one line as the head goes from left to right, and the next as the head travels back again. This makes printing faster. It's a clever trick, but do you need the extra speed? If not, you won't miss it. If you get a printer that plugs straight into PET, you won't need an interface. It narrows your choice, but why not look at that type of printer first? If they haven't the facilities you need, widen the search, but know that interfaces are then essential, and cost extra. They could be another box too, if space is important. Back to Toolkit. It'll do everything you're ever likely to want when programming. Get one, and don't mourn LINK. It was good but it predated Toolkit by several years. Your sound-box inside PET is, we're afraid, primitive. If you've got a tape recorder with an auxiliary input socket, you're inches away from good sound via the user-port. No need to buy more kit; all you need is some wire and a user-port plug. Most dealers should be able to show you what to do. If not, write to us again. But see our next issue for a major article entitled "PET Music: Ways and Means". That'll bring you up to date on sound.

SUPER BASIC

In "Read/write", August issue, a routine was published that filled the screen with inverse spaces. I have written 'Super Basic' which is a utility for new ROM 16K/32K PETs, that adds 24 commands, including a computed GOTO, screen dump, and many screen display commands; one of which fills the screen with ANY character. Typing @F 160 fills the screen with inverted spaces, but any symbol may be chosen.

If any reader would like these 24 new commands they are available from me for £10 (includes loader, demo and written instructions) or I will send more information on receipt of a S.A.E.

Finally, may I say that your magazine is improving all the time. Well done!!

David Simons
19 Reddings
Welwyn Garden City
Herts

Sounds like good value to us. We have asked David to send us more details and a copy for review.

HOTLINE News & Products

NOW YOU KNOW!

It's perfectly possible to see some familiar thing nearly every day which, if you actually think about it, becomes a riddle that hadn't occurred to you before. For instance, have you ever wondered just how someone goes about putting a book index together?

It's an enormously complicated job at first sight and, in fact, there's a learned society, with rigorous entry requirements, called the Society of Indexers. Their members specialise in compiling indexes, and you can probably recognise them by their strained and abstracted appearance!

Be that as it may, the whole process has now become much easier with the arrival of a program that'll do most of the hard work for you.

Developed and marketed by Electronic Aids (Tewkesbury), "Index" is said by them to "enable an author to assemble an index for a book, and save the work on a cassette while it's in progress." We've had a quick look at it, and it certainly looks like it works a treat.

We'll report more fully in a future issue, but if you want to know more in the meantime, you can reach the firm at Mythe Crest, The Mythe, Tewkesbury, Gloucestershire GL20 6EB. Phone them on 0386 831020 or 0684 294003 if you're a struggling author who can't wait for the post!

NO, NO, NOT ARTHUR!

Here's a nice name for a product: the Askey Alphanumeric Digitizer Keyboard. But what is it, you may well ask? Fret not, for we're about to tell you.

The new TDS Askey, launched by Terminal Display Systems, is a small, light-weight keyboard, which allows simultaneous input of alphanumerics, along with digitized data. This facility is extremely useful, as you may well know (but we didn't, so don't feel bad about it!), if you're calling up a routine which numbers digitized points, or if you're heading up a data file.

If this roots you to the spot, with a small squeak of "at last, at last!", then you need to contact Ian Bryar at TDS, Hillside, Whitebirk Estate, Blackburn, Lancs. You can phone him on 0254 662244.

Don't forget to mention PRINTOUT!

GOOD AND WANTED ITEM, BUT....

The dreaded Dan Bogard and Associates have struck again, we fear. New readers to this column need to know that Dan and his merry men are the PR agency who never, but never, tell you what you actually want to know: how much an interesting item costs.

This time they're trumpeting about a really desirable accessory - an automatic head cleaning kit for your floppy drive. Do they say how much though? They do not!

The kits are available from BFI Electronics, and consist of a cleaning disk for either five-and-a-quarter or eight-inch drives, plus some special cleaning fluid. They'll handle single or double sided drives, which means every conceivable need is covered.

Except one, that is, and that's how much the damn things are! Write to BFI Electronics at 516 Walton Road, West Molesey, Surrey to find out, or ring them on 01 941 4066. If you do either, tell them their PR agency owes you the cost of a stamp or the price of a phone call, by not providing the most basic information of all.

ANOTHER SALES LEDGER PACKAGE!

The latest addition to the ever-growing army of sales ledger packages is said to be aimed at the small businessman who maintains accounts for several hundred customers. Recognise yourself? Then this could be for you.

It's also said to be "very user-friendly" and "designed to be crash-proof". Many people already running sales ledger packages might well feel tiny twinges of envy at that; we've lost count of the commercial packages we've met that obviously hated us at first sight, and proved it by crashing at every available opportunity.

To find out more, contact Anagram Systems at 9 Michell Close, Horsham, West Sussex. Phone them on 0403 68601.

If you like, you can wait for our "profile" review. We have a copy of the software, and will cover it with a full PRINTOUT profile as soon as we can. Don't hold your breath though; we have an enormous number of superb packages on hand for profile or review, and it'll be some time before we'll get through every one.

If you're in a hurry, it may be better to get in touch with Anagram Systems right away.

.....OR IS PAYROLL YOUR PROBLEM?

Landsler Software are another company producing good commercial packages from all we hear and see. Their payroll package, disk-based, has been designed to Inland Revenue specifications for computerised payrolls, which is a very positive plus indeed.

To list every facet of the software's operation would take (and will, because we're going to do a PRINTOUT profile on it too, as soon as we can) the best part of two pages, so let's just say it'll handle up to 500 employees and covers every conceivable pay situation.

You can reach Landsler Software at 29a Tolworth Park Road, Surbiton in Surrey or, if your people are getting really restive about their pay, phone Landsler at 01 399 2476 or 2477.

MIGHTY MOUSE STRIKES AGAIN!

Regular PRINTOUT readers will have achieved a certain familiarity with John Chew's mighty mouse, the overpowering logo which stereotypes every Kingston Computers' advertisement you ever saw.

But make no mistake: Kingston Computers appear to be one of the most inventive groups around, and their latest announcement simply underlines that a bit more.

It's called NETKIT (every Kingston product has a nice name you can easily say!), but this one looks like more of a breakthrough than usual - and, without pushing Kingston too hard, is saying something!

NETKIT is a hardware-firmware package that lets a relatively inexperienced programmer work with 10 new Basic commands, to get "hitherto impossible configurations without recourse to tedious machine-code routines". It lets PET act as a smart or dumb terminal, handling virtually any protocol and character conversion the user wants. You can see what it looks like in our picture.

It'll do much more too. To find out how much more, contact Kingston. You can reach them at Scarborough House,

Continued on page 13

Buy a microcomputer for under £1,000 and you could be on your own! Unless it's a Commodore PET

Commodore produce Britain's number one microcomputer. But we don't stop there. We also insist on providing comprehensive support throughout our national dealer network.

Our dealers can examine your needs and demonstrate which hardware and software will suit you best. Their trained engineers are always at hand and a 24-hour field maintenance service is available. Your local dealer can tell you more about the following Commodore Services.

The Commodore PET

The Commodore PET computer range covers everything from the self-contained unit at under £500 to complete business systems at under £2,500.

Commodore Business Software and Petpacks

Our software range covers hundreds of applications. Business software includes Sales and Purchase Ledgers, Accounting, Stock Control, Payroll, Word Processing and more. In addition over 50 Petpacks are available covering such titles as Strathclyde Basic Tutorial, Assembler Development System, Statistics, plus our Treasure Trove and Arcade series of games.

Commodore Approved Products

Compatible products of other manufacturers with Commodore's mark of approval are also available.

Commodore Courses

Commodore offer a range of residential training courses and one day seminars. An excellent start. And when you have installed your system the PET User's Club Newsletter can keep you informed of new ideas and latest developments.

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Continued from page 10

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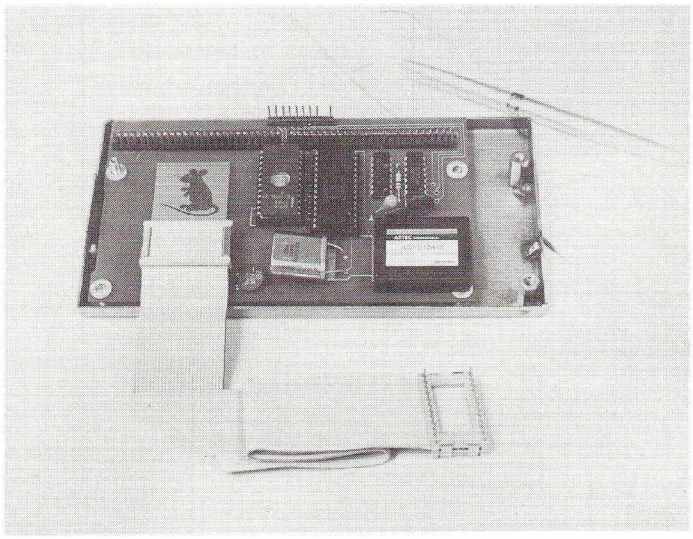


Be prepared for long conversation if you phone; John Chew's a nice and knowledgeable guy, who'll tell you all you want to know and more.

NEWS FROM COMMODORE

Two official releases from Commodore, plus an official comment from Kit Spencer on an intriguing piece of Stateside speculative journalism. Read on.....

First, the new "Commodore-approved catalogue" is out. That's the one that contains details of over 50 things the Commodore officially endorses - which does mean they've been through a pretty rigorous testing procedure. You'll find all sorts of things in it, from hardware, through firmware, to software. Get a copy from the Commodore Information Centre at 360 Euston Road in London (phone 01 388 5702).

Second, an item intriguingly headlined "Commodore Woos the Educational Market", which turns out to be official confirmation of the relaunch of the much-loved (ever since it was withdrawn; it was hated until then, such is the perversity of man) small-keyboard PET 2008.

It'll cost you £425 plus VAT, and you'll never regret it. Why, there's not one of us oldsters around who didn't cut his or her teeth on the thing!

Now the Stateside press item, which we again stress seems to be speculative journalism at its best. It appears Commodore showed "a version of a low-price personal computer console, which it said is aimed at the hobbyist market, and will be marketed in the Fall. Called the Video Interface Computer, CBM said it will be offered in three forms: a 4K black-and-white unit, using simple PET Basic, for $199.95; a 4K unit with colour capability for $299.95; and an 8K with colour capability and a large keyboard for $399.95. They feature a built-in light-pen interface; a joystick interface; 23 character by 25 line display; a sound synthesiser with 3 programmable tone generators; and high-res (184 by 200 point) and lo-res (92 by 200 point) graphics."

Kit Spencer of Commodore UK says that what actually happened was a purely private showing to various people of a potential range of CBM products, that may or may not be marketed, to ascertain reactions. Kit and CBM are making no further statement, since there's no formal commitment to market the items demonstrated, and it could be misleading to suggest otherwise.

Very dignified, entirely honourable, and we appreciate Kit's limited but understandable frankness. That's good PR.

We have only one comment of our own: did you notice that Video Interface Computer, the unit all the fuss is about, can be acronymically called VIC? And doesn't that sound a bit like the run-up to the official launch of the Personal Electronic Transactor, otherwise known as PET?

Things get more interesting all the time, don't they?

THERE'S STILL LIFE.....

John Conway's game of LIFE, simulating the development of successive generations of cells from an original pattern according to simple rules for birth and death, was described in John Still's article "Life on a PET" in our May 1980 issue. The set of 10 programs on one cassette entitled "LIFE-FORMS", which was mentioned, is no longer published by Petsoft, but is available direct from the author. Each program is within 8K and will run on old or new ROM PETs. Besides the rules and instructions and the necessary machine code, over 100 patterns and "scenarios" are included, each entered complete by a single key. Any pattern can be altered or added to at any stage, and the player can enter his own pattern at any time. Price £5, post free, including a contents list of all the programs, from J.E. Still, 66 Rugby Avenue, Wembley, Middx. HAO 3DJ.

COMPUTERCLUB DISCOUNT

As a result of a delay at the printers, copies of the last issue reached some readers too late for them to take advantage of a special reduced price offer for membership of Computerclub. The Club have kindly agreed to extend the deadline until October 30th; if you join before that date it will cost you £7.50 inclusive of VAT. Thereafter membership costs £13.25. The address is: Computerclub, 42 Great Windmill Street, London W1V 7PA. Telephone 01-434 3914. If you are enquiring about full price membership they will send you a free copy of the Club Newsletter upon receipt of a large stamped addressed envelope.

One of the advantages of membership is that it entitles you to a discount on a wide range of equipment and software. We like the sound of that!

COMMODORE TO DROP WORDPRO?

In an intriguing about-face Commodore's international arm, CEL have acquired worldwide marketing rights to the WORDCRAFT word processor. The irony lies in the fact that the program has hitherto been regarded within Commodore as the most serious rival to their own 'official' word processor, WORDPRO.

The move appears to have been triggered by a disagreement between Commodore and WORDPRO's authors, ProMicro of Canada. To further complicate matters, ProMicro are setting up a joint company with NEECO, themselves Commodore's U.S. East coast distributor, with the intention of marketing WORDPRO internationally. Insiders believe that this could place a strain on relations between Commodore and NEECO.

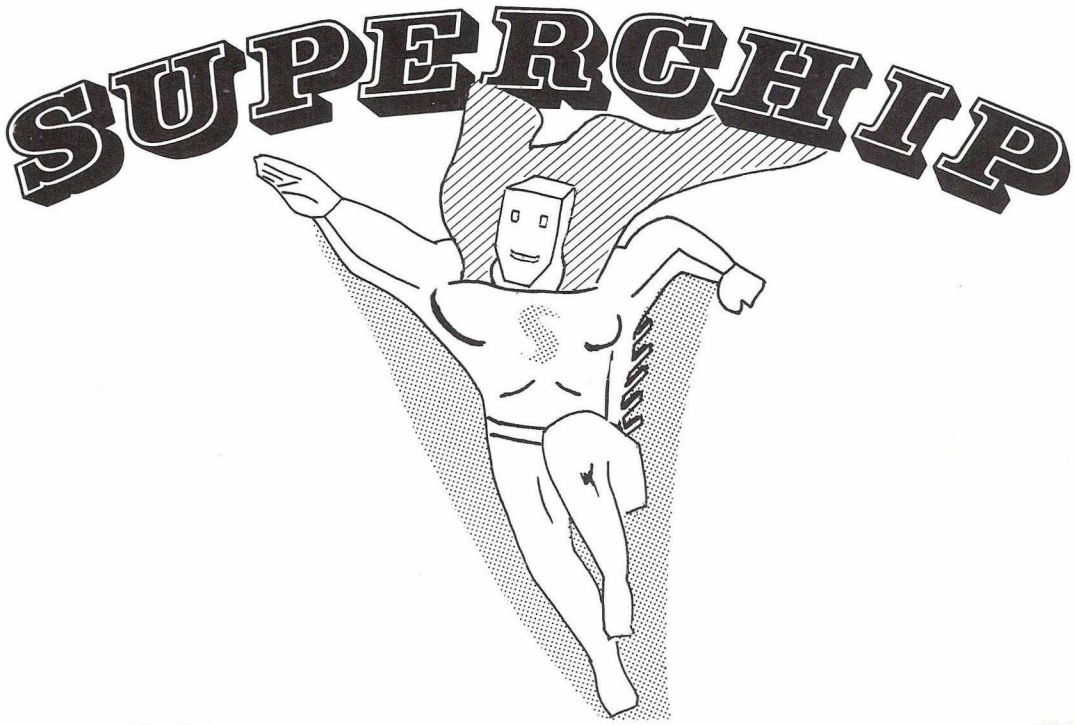
WORDCRAFT's British distributor, Dataview of Colchester, who signed the deal with CEL, have declined to surrender their U.K. territory, and will market it here themselves.

Commodore U.K. have now ceased deliveries of WORDPRO. Software Manager Mike Whitehead commented: "In the light of the deal between CEL and Dataview, it would be awkward for us to market any word processor other than WORDCRAFT."

Note: The CompuThink disk version of WORDCRAFT continues to be distributed by ACT Petsoft.

VANDALISM!

A number of 16K PETs now in circulation (almost certainly "grey" imports) have had the RAM chip holes in the PC boards wave soldered with the intention of preventing upgrade to 32K. It has now been reported that the latest batch of 16K PETs to reach dealers on America's West Coast have large holes drilled through the middle of the socket location, destroying the traces. Prospective 16K PET customers are strongly advised to purchase the 32K model if they feel that they may subsequently wish to add more memory.



New Firmware for your PET

Supersoft of North London have announced a new ROM. Installed in one of PET's spare sockets, many new commands become available. Are they useful? Is it really worth it? PRINTOUT investigates.....

Supersoft are based in Eastcote, a pleasantly green and leafy north-west London suburb. Out of this environment, however, have come some of the year's best programs, and now an extremely innovative firmware chip.

But a chip can be innovative without necessarily being useful, so we looked very hard at what Superchip (as Supersoft label it) will do. At £45.00 plus VAT, it clearly has to work fairly hard to earn its outlay.

Our review copy arrived as an EPROM, a fact we didn't immediately realise because of a small label over the ultra-violet eraseable section of the chip.

We left it on the desk for a while, where it eventually basked in a powerful shaft of sunlight. A sixth-sense whispered, and with a strangled cry, we leapt over to rescue it before the program vanished. No harm seemed to have been done, because all worked as it should after we'd installed it. Supersoft tell us it will be supplied as a normal ROM when full production commences, so you shouldn't have this problem. But just in case, be careful!

COMPREHENSIVE NOTES

The notes and instructions which come with the chip are comprehensive to the point of being overpowering - and that's in no way a criticism!

They start with installation instructions (Superchip goes into the right-hand empty socket, so there's no conflict with either Toolkit or, for instance, CBM's WordPro suites)

Virtually every competent PET owner should have no trouble putting the chip in, but Supersoft have included all the cautionary notes we like to see.

COMPUTHINK CONFLICT

We must make one thing very clear right now, however: Superchip will NOT work if you have CompuThink disks, even with the extra help of a Spacemaker.

There's a conflict between CompuThink's ROM chip addressing, and Superchip's. Supersoft are studying the problem, and may find an answer, but CompuThink owners are out of it for the moment.

If you have CBM's disk unit, you need to load DOS support before activating Superchip, but that's no problem, and there are no other apparent conflicts between CBM's disks and Superchip.

WHAT WILL IT DO?

Right: Superchip's installed; how do you use it, and what will it do?

First, you "initialize" (or activate) it by one of several alternative SYS calls, plus a possible and occasional POKE also. The latter modify Superchip functions; more on that in a moment.

One SYS call activates every Superchip function; one activates the keyboard functions only (about which more in a moment); and one only activates something called Retrace (again, more in a moment).

Once activated, nearly all its functions can then be used by direct keyboard entries, or called from within a program, while the latter is running, by a SYS specific to that function.

There are three more SYS commands which do exactly the same as those just mentioned, but additionally activate Toolkit, if you happen to have one.

KEYBOARD OR SYS CALL

Once Superchip's activated, each of its possibilities is, as we've said, either used from the keyboard, or called with yet another SYS, unique to the desired possibility.

We found this a bit hard to get used to, since a great deal needs either to be remembered, or listed and stuck on the wall over PET.

We've no doubt though that it wouldn't take long for the function keys and the SYS numbers to become second-nature. Or, at least, for those you most use to become so.

And, of course, there's the undeniable advantage of utilising Superchip's functions from within a program while it's running, as well as from the keyboard while programming.

To call a function from the keyboard, you press the Run/Stop key, followed by one other; a simple thing to master.

REPEAT FUNCTION

Superchip's first bonus is a repeat function, which either works on absolutely everything, or on the cursor movement keys only. You choose which with a simple POKE.

Repeating starts after half a second (but the delay is variable with another POKE), so we tended to leave the total repeat function on. We didn't, at any time, find ourselves getting caught with repeats we didn't want.

Repeat also operates with any of Superchip's special functions - an advantage we didn't altogether understand, but there's a lot available, and we may well find a reason with more use.

Finally, you can control the repeat speed with a third POKE.

Thus three POKEs determine what repeats, how soon it repeats, and how fast it repeats, which is pretty comprehensive!

SCREEN FUNCTIONS

Superchip's next possibilities are 9 "Screen Handling Functions", used from the keyboard, or called with another and quite separate SYS entry.

Already this means, as far as we've now got in this review, that you have 15 keyboard commands, or SYS possibilities, and three possible POKEs, any of which you may want quite quickly.

A catalogued list thus sounds sensible; maybe Supersoft should summarise all the SYS calls in their instruction book, or you may want to do it yourself. There are even more to come!

The first pair of screen handling functions are "Erase Begin" and "Erase End".

The former clears all or part of a program line, from the start of the line to wherever the cursor might be.

The latter clears all or part of the line, from the cursor's position to the end of the line.

MEMORY NOT CLEARED

Now it's important to note one thing here: the line is NOT cleared from memory, only from the screen. Memory clearance only occurs on a Return, of course.

Thus overtyping new program line material is made more easy, because it's done into a blank space. On the other hand, some (but only some) program line editing is easier.

This is so if erasure is from the cursor to line-end, because then a Return after erasure enters the new and shorter line.

The opposite isn't true, because erasure from line-start to cursor naturally removes the line number.

A Return at that stage inevitably produces an irritable (and irritating) "syntax error" from PET!

The foregoing presupposes multi-instruction lines; if you normally put one instruction per line, this won't worry you.

DELETE AND INSERT

Having said all that, the next two functions cure most problems, for they're "Delete Line" and "Insert Line".

Again called by from the keyboard or by separate SYS commands, they do what you'd expect: either delete a line, and close everything else up; or insert a line (actually, a space for a line), moving everything else down.

Again, in delete, the line is still in memory, and will reappear if the program is listed. Total destruction will happen only if a renumber operation is carried out.

3 LINKED FUNCTIONS

The next functions are a triplet: Scroll Up, Scroll Down, and Scroll Window.

Once again, activation comes from the keyboard or a SYS call, and the names of the first two are virtually self-explanatory.

In the first, whatever's on screen can be scrolled up line by line - a function which it's only too easy to obtain anyhow!

☆ SUPERCHIP cont. . . .

The second, however, gives a very useful extra - the ability to scroll down line by line.

In both, the cursor stays right where it is throughout the scrolling operation; it's the text, or whatever else is on the screen, that moves.

SCROLL "WINDOW"

The third linked function - Scroll Window - is the real bonus, and emulates one of the valuable features on the 80-column SuperPET.

Up to 9 lines at the top of the screen can be "protected", while the remainder of the screen is scrolled up. The "protected" lines are untouched during the scrolling, of course.

This seems to us to be a very useful feature during programming development.

INSTANT LOWER-CASE

The last two screen functions are Graphics/Lower Case Toggle, and Escape.

The former is very good indeed. It quite simply lets you snap back and forth instantly between lower-case and graphics at the touch of a key.

"Escape" is a little more obscure. To quote from Supersoft's instructions: "it allows escape from or to programmed cursor mode."

What this actually means is something that many programmers will welcome. It lets you get out of that annoying position when, after you've opened one set of quotes, you then find that you can do nothing but get programmed cursor characters. Use "Escape" and this problem disappears immediately.

ONE-KEY ENTRY

Superchip's next batch of functions number 26 in all! They're all interlinked, however: the instant entry of an entire Basic command word, by simply pressing one key.

The criteria for selecting the Basic functions was apparently the frequency of their use, or their complexity/length.

Thus the string handling functions are in the list, with the nice touch of including the opening bracket which they need.

Also there are the expected GOTO, GOSUB and other much-used expressions.

The snag, it seems to us, is the fact that (currently, at least) we can type GOSUB, for example, faster than we can remember that "B" is the key that'll produce it for us.

This doesn't apply to all the keys; most of the mnemonics are good and thus easily remembered, but for some it's a little hard.

Nevertheless, computers costing many times PET's price include the one-key-one-keyword feature as part of their high-cost specification.

There must therefore be programmers who expect, want, can use and will now welcome this feature.

STILL MORE FUNCTIONS

"Retrace", Superchip's next function, can be separately activated, as we said at the beginning of this review.

Once turned on, it keeps a record of every program line executed, saving the last 10 at any one time, and displaying them on command.

The command would be given in a debugging situation, after halting the program; a process easily achieved by using "Hold", yet another Superchip feature.

None of Superchip's final three routines are directly accessible from the keyboard, though each is called by yet another SYS.

"Shrink" is now a Superchip-encapsulated version of an already successful Supersoft program by the same name.

It instantly removes, from any program on which it's unleashed, every single REM statement (and anything in a REM statement), and every single redundant space.

The effect on some programs, in terms of space saving, is remarkable. Thus "Shrink" is a useful routine to have permanently in-board, as it were.

"Reverse" allows the instantaneous reversal of any rectangular section of the screen, of any pre-defined size.

Calculation of the size and position of the reversal is not enormously difficult, though it does involve playing with MSB and LSB. That's Most Significant Bit and Least Significant Bit.

NEATLY LUCID

However, Superchip's instructions now give a neatly lucid explanation of MSB and LSB; two quantities that have been, to some, esoteric mysteries. There's thus no need to fear on that score.

The usefulness of "Reverse" must be a matter for the individual programmer, or the individual's imagination.

We feel it's not a function we'd use often, but given a need, "reverse" is by far the easiest way to satisfy it.

Then there's "Movit", a routine which transfers *any* block of memory, ROM or RAM, from *any* location to *any* other location.

With "Movit", Superchip enters advanced programming realms. It won't need us to tell those operating in such areas just how useful the "Movit" facility is.

MORE ADVANCED PROGRAMMING

The last two features go even further into advanced programming.

First, Superchip provides 10 user-definable function keys (otherwise 0 to 9).

Each of them can either be used to scroll the lower part of the screen (echoes of SuperPET again!); or be employed to pass control to your choice of machine-language function.

And (really!) last of all, a user-definable message can be stored, and brought up on-screen by pressing the Run-Stop and then the Home Cursor keys.

So there we are: an immense amount of capacity, and an enormous number of subroutines, all packed into one little ROM.

DO YOU NEED IT?

How useful is it? Do you need it? How helpful will you find it?

We must confess that, at the outset of our tests, we were impressed by the thought which had gone into Superchip, but rather more doubtful about its immediate usefulness.

Now, however, after having had it available (and having used it increasingly) for a reasonable period, we've no hesitation in commending it.

Quite simply, like those famous chocolates, it grows on you.

You don't have to be a serious programmer to use much of what Superchip offers.

If, on the other hand, you're a medium to advanced programmer, then (in much the same way as Toolkit before it) after a short while you'll wonder how you managed without it.

It's good; it works; we found no bugs; it seems to us to be reasonably priced; and we recommend it to everyone but CompuThink disk users.

And even then, Supersoft may well find an answer before long.

Supersoft are at 28 Burwood Avenue, Eastcote, Pinner, Middlesex. Tel. 01-866 3326.

THUS ENDETH THE FIRST VOLUME!

Eagle-eyed readers will have spotted that this is PRINTOUT 9. This means, of course, that next month's issue marks the end of our first year and first volume.

In that time, we've nearly trebled our physical size; covered dozens of PET subjects no other magazine has touched; and printed hundreds of column inches on products, programming, peripherals and the PET scene generally.

We hope you'll stay with us in our second year of expansion; we believe that, as a PET enthusiast, you can't afford not to.

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Apart from anything else, and in these inflationary times, we may not be able to hold the present subscription rate much longer.

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Soft-ware REVIEW

PROGRAM NAME: Screen Display Aids
DISTRIBUTOR: JCL Software, 47 London Road, Southborough, Tunbridge Wells, Kent
AVAILABILITY: Cassette £18.00
CBM Disk £20.00
REVIEWER: Terry Hope

High-speed Screen Display Aids 2 is the full title of this program, to put the record straight, and to avoid confusion with the earlier program from the same authors (Screen Display Aids 1).

Screen Display Aids consists of a number of machine-code subroutines, each of which creates a specific display effect on-screen, when called from a program by a SYS command.

All the routines come within a Basic program, which aims to teach the routines to the user. After the teaching process is over, the Basic program is deleted with the normal NEW command, leaving the machine code routines *in situ* for use as desired. All of them are thus tacked on to any new Basic program written and saved while the routines are still in memory, and thus all are available for use at any relevant point in the program.

There is a very specific programming requirement insofar as the method of saving the Basic program is concerned, but providing that is followed, the routines and the newly-written Basic program all get saved together.

Obviously the major worth of Screen Aids 2 must lie in the screen effects which it gives, so let's have a look at those.

First, a border can instantaneously be drawn around the screen, and two options are available: either the screen contents can be preserved within the border; or the screen can be blanked with only the border in evidence. If the screen contents are to be preserved, they must obviously be clear of the screen edges.

Next, any specified lines on the screen can be reversed at will, after they've initially been placed on-screen in the normal way. The effect can equally be cancelled, and this is (maybe a little unfairly), listed as an extra option. It did seem to me that the two effects - reverse on and reverse off – were part and parcel of each other. You'd hardly be likely to reverse lines, and leave them that way!

Next, any given line can be flashed on and off, to serve as a user-prompt. The Basic demo program makes great use of this effect, and therein lies its undoing, at least as far as I was concerned: the entire 40-character line is reversed, regardless of whether the characters in the line were the full width of the screen. The effect (since quite a bit of the line is simply reverse-screen) is a little garish. There is, however, a considerable bonus attached to this effect; it waits for a key to be pressed and saves the ASCII value of whatever it might be. More of this in a moment, since it's an extension of this that's been added to make the new Screen Aids 2 program.

Next, the entire screen display can be instantaneously saved into memory, and equally instantaneously retrieved. This has got to be good for menus and the like, and I can think of quite a number of other areas where it would be useful. Again, this option is parlayed up to two benefits - the ability to put it into memory, and the ability to get it back again. One is part and parcel of the other, since there's no point in saving if you're not planning to get the saved item back at some time!

Finally, a repeat key function can be enabled and turned off at will. A nice extra touch, this.

Now, to come back to the extended input routine provided by Screen Aids 2. It's very clever, but takes a large amount of understanding.

In brief, it provides a genuinely fool-proof input routine for any program which relies on what might be inexpert user-input. There just ain't no way you can screw the input up with this routine, nor can you apparently crash the input process, no matter what you do. The problem lies in the constraints it puts on the screen lay-out, for the input is provided against the left-facing arrow, which appears hard against the left margin, when the routine is waiting for input to be provided.

It's very, very clever though, especially in that the programmer can specify whether the input is to be figures, alphabetic characters, a mixture of both, and the precise length of the string required. Once specified like this, nothing else whatever will be accepted, and every key in sight, excepting those which have been freed, is rigorously disabled.

So that's what Screen Aids 2 will do for you. Are there any disadvantages? Well, I spotted one right away. The instructions for use lie totally with the initial Basic tutorial program, and - sorry, I have to say it - they're darn nearly illiterate! Spelling errors are littered about everywhere; the instructions themselves are scrappy in the extreme; what you're told is a million miles from being easy to understand. The whole thing is such a great shame, for it's the clearest example of a very good ship being spoilt for want of a ha'porth of tar.

Doubtless there'll be those who'll enjoy deciphering what's intended, and the way to achieve it. But in a program that's said to be (and should be, and potentially is) an aid, why make it so hard to be helpful?

That said, I still have no hesitation in recommending the program. It's clever, novel in programming approach, well-thought-out (with the glaring exception of the appalling instructions,) and should earn its keep on most programmers' shelves.

Ratings:

First impressions:	65
Value for money:	78
Programming style:	98
Absence of bugs:	95
Usefulness:	85
Graphics:	50
Instructions:	15

PETS & PIECES

by Gavin Sanders

IS IT FAIR OR ISN'T IT?

Folks, it's only right to warn you now that I'm going to be a bit bloody-minded this month.

Why? Because I've had it up to *here* with warranties. which, compared with what's on offer for comparable products, could be said to be downright, plain old-fashioned penny-pinching.

I mean, really! Who else these days grudgingly grants a 90-day guarantee, with all the sweet, simple sensitivity of Scrooge kicking Cratchett.

You know how long 90 days is? It's just over 12 weeks, that's what.

In other words, from the minute you buy your 90-day guaranteed product, the sands don't exactly sift slowly through the hour-glass.

And, zip, what do you know? Ninety days have flashed by. Faulty whatsit? Too bad. Something important kicking up? Gosh, sorry. Vital piece gone a bit vague? My, how sad.

Of course it can be fixed, but it'll cost you. Oh yes, and you won't mind sending or bringing the unit over, will you? You'll have to hire Carter Paterson? Well, they're in the Yellow Pages.

You know something? I can go out today to buy a car, with God knows how many big and little bits from stem to stern, and get two years guarantee on most of it.

But don't let's mess about with "most" - there's an absolute minimum of one year on 99% of what makes a motor move.

And if we didn't get at least a one year warranty, what would we say to the car dealer? "Get lost!" is what. Except the word probably wouldn't be "lost".

Forget about cars though. Look at electronic products for a minute. They're a bit more familiar to us PET-owners, aren't they?

Japanese television sets, for instance. Hands up everyone who's got one, or knows someone who has. Keep your hands up if you know what the normal guarantee is. My, not much movement there.

And you're right: 12 months is the barest minimum you can find. 24 months is more usual, and 5 long years on integrated circuits and transistors is the general expectation.

Integrated circuits and transistors. 5 years guarantee. Hmmm.

ICs and transistors are in computers too, aren't they? In fact, they're almost the only damn thing in computers, isn't that so?

Is it only me, or do you too find yourself wondering what the hell those who only give 90 days guarantee are afraid of?

OH NO, I FORGOT AGAIN.....

Here's a scenario. See if you recognise it.

You've had an idea for a program. It's a good idea, and after you've been working on it for a while it looks like it'll be a great program.

You may be using a Toolkit, or perhaps a software routine instead, which is helping you develop it, and you're tending to debug it as you go.

This means you keep on finishing up with a slightly altered version of the program, each one being a step forward from the one before.

You start out with the best of resolves: you'll save every single development, so that you'll always have the latest on hand.

But somewhere along the way, you forget. Usually in the small hours of the morning.

Now the Programming Universe has certain immutable Laws. And one of them is the program you're most likely not to save will be the version you can least afford to lose.

Well, if computers are meant to take the drudgery out of work, here's a little 6-line routine which does just that for your failing memory.

You put it right at the end of your developing program. The suggested numbering is Line 60000 on.

Let me give you the routine quickly first, then say a word or two about it. You'll notice, incidentally, that it takes 6

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"If you want what's best for your PET, choose Commodore software."

Kit Spencer
General Manager
of Commodore Systems
360 Euston Road
London NW1 3BL

The Commodore PET is Britain's best selling micro-computer, with over 10,000 already installed in a wide range of fields, including Education, Business, Science and Industry.

This has led to a tremendous demand for high quality software.

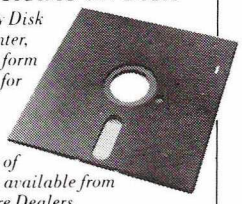
And Commodore has met this demand by producing a first class range of programs, now available from the nation-wide network of Commodore Dealers.

Commodore's support also includes training courses, a Users' Newsletter and Official Approval for compatible products of other manufacturers who reach agreed standards.

NEW BUSINESS SOFTWARE PROGRAMS ON DISK

Commodore's Floppy Disk Unit and high-speed Printer, combine with the PET to form a complete system (ideal for running a business) for under £2,500.

Commodore also produce a growing range of business software on disk available from Official Business Software Dealers.



Business Information System – COMBIS £150 + VAT

Combis facilitates the storage and instant retrieval of all kinds of company records, from personnel files to mailing lists and printed address labels.

Stock Control – COMSTOCK £150 + VAT

Comstock provides an accurate, up-to-the-second and comprehensive stock position for as many as 1,300 products.

Word Processor – COMWORD £75 + VAT

Comword turns the system into an excellent word processor.

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Compay is a new, comprehensive payroll package.

COMMODORE PETPACS

Over 50 Petpacs of programs are available (mainly on cassette) from Commodore Dealers.

These cover such popular titles as Strathclyde Tutorial, Statistics pack 1, Assembler Development System, Stock Market Trends and the Treasure Trove Collection of game packs including the award winning Star Trek, which is packaged with Petopoly. Prices are from £5 to £50.

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PET systems are simple to use and any normal advice or assistance you may need can be obtained from Commodore Dealers.

On the other hand, for rapid training on a basic or advanced level, you will certainly be interested in Commodore's intensive 2 and 3 day residential courses. We also run one day general appreciation seminars.

PET USERS' NEWSLETTER

This is Commodore's official method of sharing new information and ideas between the many thousands of PET users. The newsletter is published regularly and for an annual subscription of £10 you can start receiving copies now.

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Look out for this sign. It tells you that compatible products of other manufacturers have met with our standards of approval.

(Tick the appropriate boxes)

To: Commodore Information Centre, 360 Euston Road, London NW1 3BL 01-388 5702

I am a PET owner ☐ Please put me in touch with my nearest dealer ☐

Please send me details of: Commodore PET Software ☐ Training Courses & Seminars ☐ I would like to receive the Users' Newsletter and enclose £10 annual subscription ☐

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commodore

We made small computers big business.

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lines which could just as easily be 4.

It's been expanded only because it makes the separate lines shorter. This means we can make the reproduction bigger in our new two-column format. By all means collapse the last three lines down to one.

```
60000 I=1031:A$="0:"
60010 A=PEEK(I):IFA=0THEN60030
60020 A$=A$+CHR$(A):I=I+1:GOTO60010
60030 A$=LEFT$(A$,(LEN(A$)-1))
60040 A$=A$+RIGHT$(TI$,3)
60050 SAVEA$,8:END
```

There's one other thing you need to know. Line 0 in your program should contain your program title, like this:

```
0 REM"PROGRAM NAME"
```

```
(be sure program name is well under
 the maximum 16 characters - it will
 have a time code added to it!)
```

OK, what does it do? In the form I've given it, it automatically saves your program on the CBM disk unit every single time you run it during the development stages. And that saved version is unique.

Unique? Yes, because a different (and ascending) time-coded number is added to the program title on each save. You therefore finish up with a disk full of progressive variations of your program, each identified by a different number in the name.

There's no way you can forget to save, because the operation is entirely automatic. All you need do is leave your CBM disk unit on. (CompuThink users will need to change the "save" code, but that's no great hassle).

It'll work for cassettes too. Simply change the "8" to a "1" in Line 60050. This'll produce the "PRESS PLAY AND RECORD" message, but you'll have to do that for yourself, at least the first time round.

Only one thing: don't forget to remove the lines when your program's complete, or you could finish up knee-deep in copies!

IS IT A BOMB OR NOT?

The continuously appalling situation, insofar as terrorism is concerned in the world, seems to be reaching out and affecting some of us hackers too.

Petsoft, for instance, tell me that the area in the UK from which they get most complaints about unloadable tapes or disks is almost anywhere in the Aldershot district.

They theorise that most mail which goes there, especially if it's in those padded "Jiffy Bags", gets subjected to a hefty irradiating dose of something or other, which often removes all or part of a magnetic recording.

The same thing apparently happens with a lot of the stuff they send to B.A.O.R. in West Germany.

The solution seems to be wrapping tapes or disks in kitchen foil, but I wonder?

If I was a suspicious-package-checker, I'd react very unfavourably to a totally opaque thing, clearly wrapped in something to make it opaque. That's always assuming some form of X-ray is the cause.

If it's a metal detector on the other hand, kitchen foil should be guaranteed to make it scream its electronic head off!

I don't really know what the answer is, but metal foil does seem to help some. So, if you're contemplating posting tapes or disks anywhere, I'd suggest you wrapped them up in foil first.

To make the nightmare worse though, Martin Maynard of Audiogenics told Terry Hope not long ago that anyone who knows anything never, but never, travels on London's Underground with tapes and disks. Not unless they're heavily protected, that is (the media, not the traveller!).

This time it's the intense electro-magnetic fields, thrown around by sparking on the live rails, that's at the bottom of it all.

Looks like we're just gonna have to sit at home, programming quietly by ourselves! But then that's what most of us do anyway, isn't it?

DISCOVERY OF THE AGE!!!

Here's this month's tail-piece, saving lovingly till last, for the impact it'll cause in various places. Like Slough, for instance.

Quite some time ago, I bought myself a copy of Commodore's ComWordPro III, a word-processing package without which I'd never get through this column each issue, plus a lot of other writing tasks I handle.

It's not the only one in use in PRINTOUT, either. Terry Hope uses one also; another's employed by our occasional contributors; and this leaves aside Lindsay Doyle's ComWordPro II (see elsewhere in this issue).

ComWordPro III is very good indeed, though the manual is stunningly bad. Once III's intricacies are mastered, however, it's a terrific word-processor.

Many of you will know (because you use it, or you've read about it) that ComWordPro III comes as a disk and a plug-in ROM. You'll have assumed therefore that the plug-in ROM plays a vital role in ComWordPro's III operation.

You couldn't be further from the truth if you tried!

I've just stumbled across an extraordinary fact, and it IS a fact, believe me. The production of the column proves it.

The ROM is absolutely, totally, one-hundred-per-cent unnecessary; a flim-flam smoke-screen created by Commodore for purposes only they perceive; an add-on appendage with no apparent (I use the word with care) purpose; the most chuckable chip you ever gave good money for.

The ComWordPro III disk needs merely to be loaded, without the ROM plugged in; the extensive machine-code listed on-screen via the monitor; one single change made to one single byte in the listing; the program resaved straight away; and from then on ComWordPro III needs its ROM like I need an invitation to a Borgia wine-tasting.

When I discovered all this, I didn't believe it at first. After 5 minutes testing, I did.

And there's a delicious irony.....the disk itself contains the entire text of the extensive manual that comes with the package. So even a hard-copy of the manual becomes unnecessary.

Commodore, of course, call the chip a "Program Security ROM". It's now terribly obvious whose security they're talking about. I have no argument with them on that; I detest software pirates for what they do to our business and hobby.

But when you remember all the problems which this particular chip's location caused, in direct conflict with other firmware chips doing a lot more good, it's a mite irritating!

I think, as I finish, that I'd better make something clear immediately. Wild horses won't drag from me the location of the byte to be changed.

I do realise that this will serve as an irresistible challenge to my readers, but then 'twas ever so!

That's all for this issue, friends. Go safe, have fun, and see you next month!

PETAID

A DO-IT-YOURSELF DATABASE?

There's a move to more serious PET uses. Databases are one. But isn't it hard to get a database up and running? PETAID'S inventors say "no". We check.

PETAID, from Stage One Software in Bournemouth, is widely advertised. "Every PET should have one", say the advertisements, stressing that PETAID is a database creator which anyone can use.

Clearly excellent if true, since databases can be extraordinarily useful in many areas, business or home. But it's also reckoned that designing and setting up a database isn't exactly for beginners. And, because efficient databases must be disk-based, if a disk unit isn't easy to handle, the difficulties multiply.

PETAID is said to wipe those problems away, or at least to minimise them markedly. As we said, fine if true.

ONE WAY OF STARTING

It does seem to us that PETAID will let a total beginner create a fully-operational database, quite literally in hours, with absolutely no knowledge of programming at all.

If the user is a little more advanced, the end-result is likely to be quite sophisticated. And given a highly-proficient programmer, capable of writing his or her own add-ons to PETAID's structure, we think the resulting database might be very advanced indeed.

PETAID is available in several forms, so we'd better make it clear now that what we're reviewing here is the PETAID Indexed Access Method, which retails at £288.65, including VAT. It's known as IAM; it's the top package; and it's obviously not cheap. But there are less expensive PETAID versions, with only slightly reduced facilities, which cost less.

HOW DOES IT WORK?

So how does it all work, and more to the point, is it worth that sort of money?

PETAID IAM comes on one floppy disk, and consists of 8 programs, all of them complex, and some very long. Many interlink in some way, in terms of calling each other into memory at some appropriate points. Some also cause entirely new programs to be written, as a particular database is created or enlarged. More of that later.

The starting point to all the programs is the screen menu; the first program to be loaded, and the one to which you automatically return at the end of each user step. Since the Menu is the first thing you see, and thus gives you your first impression PETAID, it's worthwhile spending a moment or two on that alone. What does it show? Is it efficient?

WHAT'S ON THE MENU?

To the first question: a complete list of all the options, numbered and well laid-out, with a half-tone blank box to the right of each, the whole held in a neat frame. Press an option number, and instantly the word "loading" replaces the half-tone box, as the disk drive actions the load. Return isn't necessary (something that's so in most circumstances throughout PETAID).

Another nice touch is a POKE in the program to speed-up the screen printing. The Menu, and most of the other screen displays, quite literally write in a fraction of a second.

CREATE SCREEN FORMAT

Creation of the database screen format is the first and, it might be argued, most important Menu option. On your decisions at this stage rest quite a bit of the speed and flexibility you'll get (or not get) later. It's also the option which makes PETAID a genuine do-it-yourself database "kit".

The PETAID manual suggests you draw for yourself a screen layout sheet, with 40 columns across and 22 lines down, numbering both from 0. Thereafter, you simply follow the manual's instructions, and the decisions you've already made.

NO REAL PROBLEMS

Setting up the screen format of the trial database we planned gave us no real problems. The creation system is user-friendly to a degree, holding your hand every step of the way.

It checks you really do want to have this or that field here or there; asks you questions about reverse-field displays; puts little points up where your fields are going to go; prints strings of As to show you how it's going to look; and so on and so on.

Any problems we did have could be blamed directly on a failure to plan ahead. Again, there's that strong recommendation to think first about what's wanted, and what the database is to do.

A SUBSEQUENT SNAG

We were, however, irritated by PETAID's inability to permit screen layout changes later, once the database is up and running. This is frustrating if a lot of data has been entered, and then it's felt in hindsight that the layout could be imprved in some way.

There's no way, other than starting again from the beginning with the improved layout. But then, of course, every last bit of data has to be entered all over again. So once more the moral must be - think before setting up the screen layout.

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THE NEXT STAGE

The prompting continues with a request to name your database. In fact, you're asked for a "Filename for Header". This simply means you're titling the main database control program, which then gets written at the end of the PETAID suite of programs. For ever after, it will be on the disk that goes in Drive 0.

We had a small fright at that stage. We'd left the PETAID master disk in Drive 0, not realising that the database header was going to be written to that disk. It wasn't a disaster, but newcomers should perhaps be told to copy the PETAID main disk, using the copy in Drive 0, with a new disk in Drive 1, before proceeding.

The point, of course, is that the programs on the PETAID main disk are those from which any number of databases can subsequently flow. It's thus better that the original disk doesn't have extra database headers tacked to its tail.

ONE OTHER IRRITANT

The only other minor irritant was connected with the fact that lower-case is used throughout PETAID. Thus we titled our database "Personal Data", only to find the disk directory listing, in changing the lower-case to upper, changed the capital initials to graphic characters.

It was only milding annoying; relatively unimportant; and easily avoided for the future. But if it happens to you, don't try renaming the file; it plays havoc if it's sequential!

INTO THE DATABASE

As soon as the database is named, everything happens at once. Disks whir; messages come up on the screen; and things get written all over the place. All this happens without any intervention on your part, nor do you need to know what's happening. PETAID keeps you informed; the screen indications of what's happening to what, and where, are very good. But you need no knowledge, which is the whole point of PETAID.

The next stage, if you want to rush straight to putting data into the base, is menu option 3: File Management.

HANDLING THE DATA

From here on, this review won't cover the varied choices which each PETAID IAM program provides. There are simply too many possibilities to list.

Putting your data in is not difficult, since you're guided all the way by screen prompts. Amending it subsequently, if there's a need, is very easily done, and adding new data as it becomes available is a simple matter also.

Viewing existing data is also relatively straightforward, but here we found another small irritation. To be fair, much of it stemmed from the processes we were going through. In other words, we'd set up a database and were playing with its possibilities, hopping from one to another to gain familiarity for this review.

However, every move from one operational mode to another is always via the Menu.

MANY DOORS TO UNLOCK

This produces an unavoidable delay, which some might find annoying, while each of the two disks initialises itself, and then has its basic data read by the program control. During this process, we found ourselves constantly supplying details we'd supplied already only minutes before: the name of the database; the date; the password, if we'd included one; and occasionally the name of a sub-database too.

At times, it seemed like one hell of a lot of trouble to go to, simply to extract some data. But we stress that our handling of PETAID's facilities was totally false, in terms of the type of usage it would normally get.

At the same time, no one should expect PETAID to create the sort of database that simply stores names and phone numbers, disgorging them quicker than they can be looked up in a little book. If that's your need, you should buy a little book - it's much cheaper! PETAID is a full-blown and sophisticated database builder, which comes into its own with its search facilities.

SEARCH AND COMPARE

Once a database has been constructed, and data entered, the most complicated search procedures can be carried out with great ease. Assume, for instance, that you've constructed a database stuffed with esoteric details on hundreds of people.

You want to know how many of them are called Smith; who do have red hair; don't live in Berkshire or Somerset; do have two children (one of whom must be less than 11 years old); don't have a dog; do have a cat; and who had scarlet fever when a child?

Pulling Smiths out, if any, who match those criteria exactly takes seconds only. That's the strength of PETAID's structure and search facility. It's done with an application of well-known principles: AND, OR and NOT, plus an ability to use the asterisk to replace characters in a name, or other key-word, together with similar manipulation of numbers.

We found that the handling took some getting used to (much of it due to the multiplicity of options to be learnt), but once mastered, the results were impressive.

OTHER OPERATIONAL OPTIONS

There are a number of other operations (all called from the Menu) which are helpful.

Extract And Sort Index is one. This pulls out the key field of each record in the base (the key field having been defined right at the start), or any other field which may be specified, and sorts very rapidly into aphabetic or numeric order. Subsequently a new database header is written to the master disk in Drive 0, consisting of the sorted fields.

These can then be printed, with any other specified field from the records, using Search And Index Print. Thus one might choose to have surnames printed with birthdates; or phone numbers with STD codes; or any other pairing required.

Header Print, yet another Menu option, gives a printout of all you ever wanted to know about your header files, but weren't sure how to find out. A list of what it gives you is too long to include here, but take our word for it: it's comprehensive!

Finally, there's a Search And Label Print operation which prints labels, but only on criteria you lay down. The latter, of course, are identical to the parameters you get in the Search operation already described. That means you can be very selective indeed about your labels, if you wish.

IN SUMMARY

In our view, though not cheap, PETAID IAM is very good indeed, and will almost certainly represent excellent value for money in the right application.

It has few drawbacks; certainly none serious. Ironically, its worst is the careful thought which must essentially be put into the first stage - creation of the screen layout, and thus the database.

Ironic, because PETAID is not simply meant for experienced programmers. It's been specifically designed also to be used by people with no programming knowledge at all. The latter may find it hard at first to deploy the initial analytical (but totally non-technical) thought needed to get the best out of PETAID, and thus the best database.

But this should not be a deterrent to anyone. PETAID IAM is a well-thought-out, well-structured suite of programs, immediately useable, and supported by a first-class and extremely lucid manual.

Given the money to buy it (or one of its smaller versions); the time to experiment with it; the patience to start again if necessary, after some experience: given that, then we think it unlikely that anyone will have any cause to regret his or her investment.

SORTING OUT SORTS

Walter Wallenborn makes light of PET's most-used routine, aided and abetted by a Jim Butterfield program.

Anyone getting as far as reading an article on a sort routine doesn't have to have it explained that sorts appear everywhere. The moment you get any kind of list of data (name and address, stock, and so on) it's never in the ideal order for everything and everyone. So a list is made, sorting on one field; then a second list, sorting on another field.

But why **another** sort routine? Because sorts take time! The bigger the file, the longer it takes, but on a timescale increasing by the square of the size!

The reason sorts are slow is that they all involve some kind of shuffling, and rearranging of small groups in order until done. This means all the data is passed over again and again. Also, on the PET, if you keep moving strings around, you're creating garbage, and garbage collection is a well-known cause of delays.

Jim Butterfield's program, on which I've based this article, uses a pyramid structure, with all items in the file grouped into pairs at the bottom. Each pair is compared, with the smaller item going into the next row. When this row is finished, these items are paired, then compared, and the smaller ones go to the next row, and so on. So, at the top, we finish with the smallest item in the file.

This is the point at which the sort really begins. In the program, which asks you to give it any number (up to 100) of names and addresses, the pyramid is an array of pointers called I. The array I must be twice as long as the file to contain all the levels of the pyramid. Notice that I is an array of pointers, and that it's these which are changed, so that no strings move and therefore there's no garbage to collect!

You'll also maybe notice that, the moment the pyramid is completed, the first item is found. This is inherent in this approach, and has a very real advantage, in that the file can be made available for output as it is sorted. By providing output as you go, time is saved. Even more important, PET doesn't appear to have died, so you won't wonder "How long do I give it before switching off?"

The program creates the pyramid in lines 200 to 240. Subroutine 340 to 380 is simply the comparison routine on the field chosen and returns the pointer for the lower valued field in I.

The body of the sort is in 250 to 330. What this does is check to see if the sort is done (250) and if not print the newest item found (260). In 270 the value of X (-1 to -N (number of items)) is put into the bottom of the pyramid to stop that item being used again. Then comes the clever bit in line 250. This line uses C (the pointer to the item just printed) to find what pair it was in (at the bottom of the pyramid), puts a pointer to the lower of these two in J, and resets C to the position in the second level of the pyramid where the result of this pair goes. Did you follow that? Well, to try and make it a bit clearer, have a look at the diagrams. It's a numeric sort, where six items in a list have the values 1 to 6, but not in order. They appear in the I array as illustrated after completing the FOR–NEXT loop (fig. 1).

```
100 DIM I(200),N$(100),A$(100)
110 PRINT"■ FAST SORT DEMONSTRATION"
120 INPUT "HOW MANY ITEMS";N
130 INPUT "1 OR 2 FIELDS";F
140 FORJ=0TON-1
150 INPUT"NAME";N$(J)
160 IFF<>1THENINPUT"ADDRESS";A$(J)
170 NEXTJ
180 PRINT:IFF=2THENINPUT"SORT BY FIELD
    1 OR 2";W:PRINT
190 TI$="000000"
200 X=0:B=N-1:FORJ=0TOB:I(J)=J:NEXTJ
210 FORJ=0TON*2-3STEP2
220 B=B+1:I1=I(J):I2=I(J+1)
230 GOSUB340
240 I(B)=I:NEXTJ
250 X=X-1:C=I(B):IFC<0GOTO390
260 PRINTN$(C),:IFF<>1THENPRINTA$(C)
270 I(C)=X
280 C%=C/2:J=C%*2:C=N+C%:IFC>BGOTO250
290 I1=I(J):I2=I(J+1)
300 IFI1<0THENI=I2:GOTO330
310 IFI2<0THENI=I1:GOTO330
320 GOSUB340
330 I(C)=I:GOTO280
340 IFW=2GOTO370
350 I=I1:IFN$(I2)<N$(I1)THENI=I2
360 RETURN
370 I=I1:IFA$(I2)<A$(I1)THENI=I2
380 RETURN
390 PRINT:PRINT"■ TIME TO SORT ■";N;
    "ITEMS =";TI/60
400 IFF=2GOTO180
```

The value of I(10) is 2 so that A$(I)10)) is 1, which is the lowest value. After this is printed (and a -1 put in I(2)), what 250 does is, starting with C = 2 (the contents of I(10)),

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C% will equal 1, J becomes 2 and C becomes 7. J is used to set up the comparisons between 2 and 3, now in 290, that is between A$(I(J)) and A$(I(J+1)). But because I(2) = -1, line 310 will make I equal I(3) and therefore 330 will put I(3), which is 3, into I(C) which, because of line 280, is I(7). You'll see all this in Fig. 2. You'll notice the very important feature that 0 and 1 as well as 4 and 5 are not needlessly compared all over again. To try making Fig. 2 clearer, the values for the variables during these next four passes of 280 are in Fig. 3.

As B has the value 10, the last pass through 280 jumps to 250 which makes C equal 4. After printing A$(4), the value in I(4) would be made -2. This carries on with I(6), I(7), and I(8), finally equalling -4, -3 and -6, and as these have all now become negative, the answer in I(10) is negative, so that 250 goes to 390, which allows you to know how long this sort has taken and sort now on the other field if you wish.

The most important thing is "How do you use it?" Well, if you want the least amount of modification, the routine from 200 to 330 could be a subroutine of your program. The only change in this would be in line 260, which must be rewritten to give you output of your variables to your printer, cassette, disk or what have you. Subroutine 340 to 350 must, of course, be replaced. In most cases you will want to sort on several fields, each of which will need one line e.g.

I=I1:IF YOUR VARIABLE(I2) IS LESS THAN YOUR VARIABLE (I1) THEN I=I2:RETURN

The variables used in the program are:-

Variable	Meaning
W	The field to be sorted on
N	Number of items to sort
I( )	This is the array of pointers
I, I1, I2, B, C, C%, J and X	These are all temporary variables used inside the routine.

One last point, for those who are adventurous. When Jim was over here, and mentioned this program, he pointed out that it worked on a binary system (as it groups in pairs). The routine will also work when grouping in larger numbers, which I'd have thought could be faster. Why not give it a try?

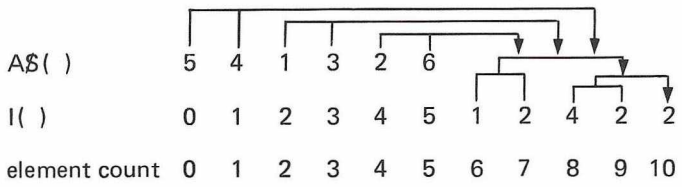

Figure 1

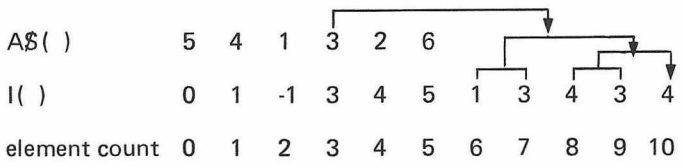

Figure 2

	C%	J	C	I(J)	I(J+1)	I(C)
A	1	2	7	-1	3	3
B	3	6	9	1	3	3
C	4	8	10	4	3	4
last	5	10	11	10	11	11

Figure 3

It's The Mu-pet Show!

Multi-User PET (Mu-pet) links 3-8 PET computers to one Commodore disc drive and a printer.

Mu-pet is very good news indeed for those PET users wanting a multi-user computer system and who, up until now, have run up against a budgetary brick wall.

Mu-pet delivers the goods at very low cost... which is one of the reasons it's become the world's biggest selling multi-PET system. Precisely engineered in the U.S. and Canada, Mu-pet makes the most of PET computers – *without the need for program changes.*

£595 is all it costs for a standard Mu-pet system that links three PET computers to a single Commodore disc drive and a printer. The cost of linking more PET computers, up to a maximum of eight, is £125 for each addition.

All machines have access to the disc drive and printer. The hardware which all runs via the IEEE bus has been so well designed that each PET thinks the disc is its own, and priority depends on who gets there first.

If you've three or more PETS, then you need a Mu-pet to make the most of them.

OFFICIALLY APPROVED BY COMMODORE

Yes, I want to see the Mu-pet show – please advise me on my nearest dealer.

Name_____

Address_____

_____

_____

PT

KOBRA MICROSYSTEMS
14 The Broadway
West Ealing London W13 0SR
01-579 5845

KOBRA

What's wrong with WORDPRO?

LINDSAY DOYLE reports on Commodore's Word Processor

INTRODUCTION

Commodore's WORDPRO II, CBM EDITOR, or WPII, is a tremendous bargain. Everyone who has the CBM 3040 floppy disk drive and does any writing should have it. It will revolutionize the preparation of your correspondence, your manuscripts, or your form letters. That said, however, there is much criticism to be levelled at it. Readers who are used to the level of quality one has come to expect in Commodore's instruction books will not find any improvement in this one. Let me emphasize before I begin to snipe in high gear, that this is a highly useable program, totally unlike some of the earlier so-called word processors offered for PET by others. My comments are restricted to experience with version II in use with the N-type keyboard and a 3022 printer. I will supply two checklists which can be used to replace the instruction book's tables and text and which correct all the errors and omissions I have found to date.

WHAT YOU GET

Physically the BS 1100 COMWORDPRO II package consists of a ROM chip, a disk, and a looseleaf instruction book.

As the instruction book makes no mention of the ROM chip, one can only assume that the factory intends that it be installed in all instances by a dealer. To make a long story short: without benefit of dealer, my chip works in position 2 with the Toolkit in position 1. It does not work in position 1.

WHAT'S ON THE DISK?

Initializing the WORDPRO disk and calling up the directory generates an impressive list of 21 "programs". All is not gold that glitters, however. Only the first two are actually programs, and only one of them is useful. "CBM EDITOR" is the version designed to drive Commodore's printers. This is the one you get when you 'LOAD" ",8'. "ASC EDITOR" is the version for other printers and to call it up you have to write a mini-program or move it into the number one slot on the disk.

The remaining 19 entries, entitled "TRAINING MANUAL" and "FORWARD", "SECTION 1", "SECTION 2", through "SECTION 14", constitute the cover page and text of an introductory instruction 'booklet'. The general drift of this stenographer's vade medum can be derived from one or two excerpts: "This forward (sic) is aimed at the boss of the person who is about to use this booklet." ..... " 'What is a word processor?' you ask yourself." ..... "Hidden from sight is a computer, and that's the bit that shuffles the words around and keeps track of everything."

Commodore's typewriter hasn't learned to spell "typewriter" yet, or "stationery" either, for that matter, but I won't dwell on these embarrassing details or the many other typos that mar this booklet. The factual errors that I have found to date are noted and the correct versions given in Checklists A and B at the end of this article.

The people for whom this little work was intended will probably never see it anyway if their instruction book, like mine, makes no reference to the existence on the disk of this alternate text!

THE INSTRUCTION BOOK

The editor has asked me to refrain from commenting on the instruction book's style (or lack of it), spelling and punctuation errors, non-sentences, and devious means of trying to make the text look larger than it is. Respecting his wish, and shortening this article by many pages, I will just suggest that most readers of this magazine who procure WORDPRO II would do well to skip the text altogether and simply experiment with the functions as they are listed in my appended checklists. These, incidentally, include notes which refer to the factual errors and omissions I have found to date. I would greatly appreciate hearing from any reader who finds additional corrections, either in CBM's material or in mine.

WHAT YOU DON'T GET

None of the graphics associated with the alphabet keys are accessible. However, with a few exceptions, the graphics corresponding to the number keys, punctuation keys, and top row of keys are provided. Unfortunately, the centered horizontal and vertical lines (shifted '@', shifted '[' and shifted ']' which form grids and boxes when used with shifted '1', '2', '3', etc.) are not implemented, and it is not possible to print vertically-contiguous graphics or continuous vertical lines. These are major shortcomings for a user who hopes to generate forms and reports. The entire printer stunt-box is ignored: there is no provision for reverse-field text or enhanced characters. Underlining is not available. *The pound sterling sign is still not offered!* Fractional line spacing, of which the Commodore 3022 tractor printer (see PRINTOUT No. 4, April 1980) is capable, is not implemented. Automatic page numbering is omitted, and there is no word count. Double-spacing is by time-wasting printing of blank lines. Tabs do not remain after text is erased from storage, but have to be rewritten for each new load. The 'right justify' function is not foolproof and occasionally leads to ridiculous spacings.

SYSTEM BLOCK DIAGRAM

There are five mutually-exclusive modes of which the program is capable. You will not find any explanation in the instruction book. When you first load the program from the disk, you will be asked in the initial step to set the number of lines desired in Main Text (98 min. to 173 Max., with Extra Text varying from 98 max. to 23 min. for a constant total of 196 lines). There is no returning to this step, and you will automatically proceed to the edit mode, which is the home condition. From it you can go to a limited set of disk utilities, a disk LOAD/SAVE mode, or an output mode which includes format setting and typing operations. You can return to edit without destroying the text from any of these modes. You can also call up the disk directories but this overwrites text, so you must save your text first if you don't want it mangled. The directory and load/save functions are shown separately from the other disk utilities because they are not called up in the same way as they are when DOS SUPPORT is in use. There is no way to exit the program except to turn power off (removing disks first). This fraught subject is not covered in the instruction book!

CONCLUSION

Having read all this, however, you should now read my opening paragraph again. WORDPRO II is a good program - what a pity it and its manual aren't perfect.

C/=control key
R/=RETURN key

CHECKLIST A
FOR WORDPRO II
ON N–TYPE KEYBOARD

Numbers in () refer to notes at bottom of table.

TO ENTER	TO EXIT		DISPLAY (IF ANY)
		::::::::: EDIT MODE :::::::::	
		FUNCTIONS WHICH ARE DISPLAYED ON STATUS LINE AT TOP OF SCREEN	
C/	C/	Control key (the RVS key) used in combination:	[C] ,C (3)
C/X	C/X	Flips between Extra and Main Text areas.	[X] ,X
C/U	C/N	Upper Case/Normal:	U,N
C/L	C/N	Lower Case/Normal: converts text to specified case as CURSOR RIGHT is passed over it.	L,N
C/S		Sets one tape at cursor position.	(dash under
C/C		Clears one tab at cursor position.	status line)
C/K		Kills all tabs.	
C/EA		Erases all text in current text	Pet Text Editor
C/ER		Erases remainder of text from cursor.	Pet Text Editor
		Column number of cursor position.	C=1 to C=40
		Line number of cursor position.	L=1 to L=173
C/A2R/		Appends paragraph of speci-	APPEND:2

Continued on page 30

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SHIFT C/	SHIFT C/	fied number from Extra Text. (see Paragraph Control Functions) Insert mode on/off: allows insertion of text at cursor without use of INST.	[I] ,I
\	\	Shift lock on/off: locks out lower case. Other shift symbols are unaffected.	[S] ,S
		FUNCTIONS WHICH OPERATE WITHIN TEXT	
		Insert/Delete Functions (see also SHIFT C/ and C*)	
INST		Standard INSERT: hold down for repeat.	
DEL		Standard DELETE: hold down for repeat.	
C/INST	C/	Inserts a blank line above cursor.	
C/DEL	C/	Deletes line cursor is on.	
R/		Deletes to end of line.	
		Cursor Functions	
CRSR		Standard cursor up, down, left, right. Hold down for repeat. Scrolls up and down.	
C/CRSR	any key	High-speed cursor up or down. Line number display inactivated during use.	(2)
HOME		First press homes cursor to upper left of screen: second press homes to start of text.	
		N.B. although no cursor-to-end-of-text function is implemented, it can be achieved with C/F if the first line of text is nowhere duplicated, or with C/↑ or C/I if no variable data symbols are in use.	(2)
		Block Move Functions	
C/R	R/	Reverses line to mark it for block move. (Any number of adjacent lines may be added to the block to be moved by using CURSOR DOWN to extend the block.)	(reversed text)
C/M		Moves marked block of one or more whole lines (terminated by R/) to cursor position. Insert function must be in use or space must be provided to move into or else block will overwrite existing text.	(2)
C/*		Inserts copy of material from top line or lines (terminated by R/) at cursor. Insert function must be in use or space must be provided to move into or else material will overwrite existing text.	(2)
		Paragraph Control Functions	
↑...↑ or |...|		Either key displays the shift-right-bracket symbol. A pair is used at the beginning of lines as delimiters for various functions as follows:	
|i5|		Indent all lines in this paragraph (to next R/) the indicated number of spaces	
|f3|		Perform line feed the indicated number of times before printing this line.	
|m2|		Left margin release: sets start of line the indicated number of spaces to the left of formatted margin.	
|6|R/		Numbering of paragraphs in Extra Text to be called up by C/A in Main Text.	
		Entering Variable Date in Form Letters	
		"Variable Data" to be inserted in form letters is first sorted in the stored	
		desired order in Extra Text. Each item is terminated with R/.	
C/B		Designates each point in Main Text at which an item of variable data is to be inserted.	(■■in text)
C/I		Inserts an entire set of variable data on screen for review before printing.	
C/↑		Steps through a letter deleting variable data item by item.	(1)
C/HOME	R/	Sets variable data pointer to top of list before printing.	HOME DATA
		Miscellaneous Functions	
C/F		Finds all occurrences in text of material on first line. Text must terminate with R/. Repeated applications will step through the text. Does not differentiate between upper and lower case.	(2)
SHIFT:		Used at the beginning of a line or after a paragraph	
or		control function, either key	(2)
STOP		displays a check mark which	
SHIFT @		labels the current line to be centered when printed. Optionally inserted in words to indicate acceptable hyphenation at end of line when using 'right justify'.	
(repeat)		Use only one per line. Most non-letter keys give automatic repeat if held down.	(2)

NOTES:
(1): The instruction book has this wrong.
(2): Not covered by the instruction book.
(3): C/ will generally abort if the wrong mode is selected.

C/=control key
R/=RETURN key

CHECKLIST B FOR WORDPRO II ON N–TYPE KEYBOARD

Numbers in ( ) refer to notes at bottom of table.

TO ENTER	TO EXIT		DISPLAY (IF ANY)
		:::::: OUTPUT MODE ::::::	
C/O	E	Displays output format menu with default values.	Formatter Section (1)
		TO CHANGE FORMAT	
L	2R/	Changes left margin to indicated number of spaces from left border.	? LEFT MARGIN
R	60R/	Changes right margin to indicated number of spaces from left border.	? RIGHT MARGIN (1)
D	3R/	Changes printer device number in case yours is not 4.	? DEVICE
S	2R/	Selects line spacing: 1,2, or 3 only	? LINE SPACING
P	32R/	Sets lines per page to indicated number.	? PRINTER PAGE
F	N or Y	Not required for Commodore printer. Generates separate line feed signal if required for other printers.	? LINE FEED (1)
J	N or Y	Inserts spaces to make last word of line end at right margin.	? JUSTIFICATION (1)
		TO SPECIFY COPIES AND TYPE	
TR/		Type one copy of Main Text or Extra Text as previously selected.	TYPE
TX5R/		Type specified number of copies, waiting for R/ after each copy.	TYPE X5 (2)
TCX5R/		Type specified number of copies without stopping.	TYPE Cont X5 (1)

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Continued from page 30

TLR/		For form letters, etc.: type copies, filling variable data blocks from Extra Text, waiting for R/ after each copy.	TYPE List (2)
TCLR/		For form letters, etc.: type copies, filling variable data blocks from Extra Text, without stopping.	TYPE Cont List (1)
STOP		STOP key, held down, halts typing at end of next line.	
C		After STOP, causes typing to recommence.	
	C/	After STOP, causes program to leave Type mode for Format mode.	≪BREAK≫
		Displays when typing has finished. Various format errors may also be displayed and will require reformatting and retyping.	FORMATTING COMPLETE (error messages) (2)
	E	After typing completed, returns to Edit.	
		:: DISK DIRECTORY MODE::	
C/D	(4)	Displays directories of both disks, program names only. Overwrites text previously in Main or Extra Text areas. Directory is automatically updated.	(1)
		: DISK LOAD/SAVE MODE :	
CLR	(4)	Press SHIFT CLR to enter Load/Save mode.	FILE NAME?
(name)R/		Accepts up to 16 characters. Accepts abbreviations if "*" is appended.	LOAD OR SAVE? (2)
L or S		If S is specified, asks for drive # .	DRIVE
0 or 1		On SAVE, if a file with the same name is found, asks for confirmation.	
Y or N		If N, returns to Edit mode. If file not found, type a new file name.	FILE NOT FOUND
		:: DISK UTILITIES MODE ::	
C/>	(4)	Enters limited disk utilities mode.	DISK COM–MAND (1)
N I V D C R S		New, Initialize, Validate, Duplicate, Copy, Rename, and Scratch are implemented as described in the Disk Manual for DOS SUPPORT. Other disk commands are not provided.	

NOTES:

(1): The instruction book has this wrong.
(2): Not covered by the instruction book.
(3): C/ will generally abort if the wrong mode is selected.
(4): Returns to Edit mode when through.

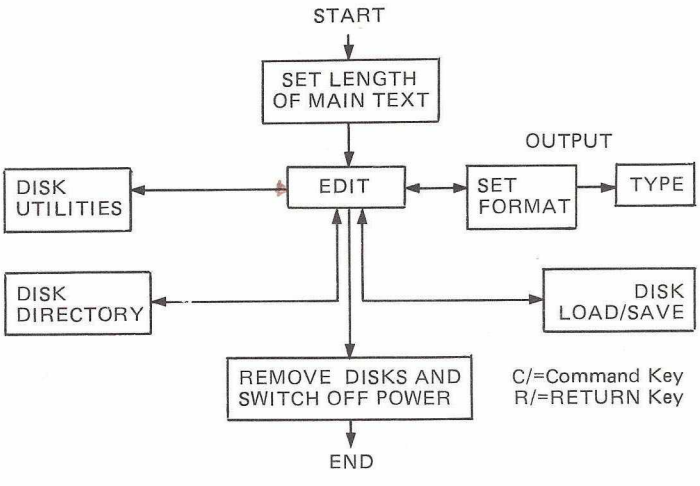


Fig.1: Block Diagram of WORDPRO II

PEEKS & POKES

by Inside Trader

'Knuckledusters' Spencer and his merry men would give anything to know where the discount stores get their PETs. It certainly isn't from Slough. Naturally Commmodore's distinguished East Coast American distributor would be unable to assist them in their enquiries.

The Yob saga continues. Master Gregory has so far penned over five hundred pages of his Pet Manual. The problem is that even Commodore innovate faster than the Great Man writes.

Is there any way of speeding up this interminable process, Terry Hope asked. "Five thousand dollars and a free trip to Europe" was the Sage's reply.

Inside Trader confidently forecasts the arrival of an amazing new printer from the Commodore. Unlike the author of its manual, it will have great intelligence. Expect it soon.

Each issue I shall be making an award for the worst piece of software to come my way. Undisputed winner this month is something called 'Murder Probe' by the Daily Telegraph's Science Correspondent, Adrian Berry. It's so bad that it really ought to bear the warning: "This program can cause brain damage". Software authors may avoid nomination by sending £5 in used notes marked "Slush Fund". The following would be well advised to send off their remittances without delay: Q-Soft, Databank, Schoolsoft, Commodore and Petsoft. In the case of Instant Software, the fee will be £10.

The mammoth Rank Organisation have just acquired a substantial share of Nestar Systems who manufacture the Programmers Toolkit. So it will be interesting to see what happens when they discover that a certain well known software pirate is flogging bootleg copies. Perhaps they will send round the man with the gong.

In February we forecast that daisywheel printer prices would plummet before the year was out. We were right. And the next couple of weeks should see the release of one with a three-figure price tag.

Sydney immigration officials took one look at the debauched complexion of Commodore Vice-President, Chris Fish before clapping him straight into quarantine on suspicion of yellow fever. It took CBM staff two days to convince them that he always looks like that.

MOS Technology (prop. the Commodore) has been advertising a free lunch in Hong Kong, airfare included, for any customer to whom they fail to deliver completed ROM chips within six weeks of order. As a result Chinese restaurants in the colony have been blitzed with reservations by greedy Commodore employees. Clue: it took MOS fifteen weeks to deliver the last set of printer ROMS.....

There are now so many ex-Commodore people at Systema that they have formed a government-in-exile. David 'Slugs' Harris has appointed himself Chancellor, with Barry Fouracre as Grand Vizier and Tom Self as Minister Without Portfolio. Latest CBM refugee, John Singer has been offered the post of Plenipotentiary Extraordinary. Very apt.

Readers may be wondering why they were denied the opportunity of hearing PET's inventor, Chuck Peddle lecture at the Micro UK Conference. All was well until it became known that Datalink's new editor, Guy Kewney, alias the Pink Panther, would be speaking. So many cancellations were subsequently received that the conference had to be called off.

Cad of the Month: Julian Allason, last seen flying Concorde to America. And where was the lovely Jessica? Flying Laker stand-by, that's where.

BOOKS

PET AND THE IEEE 488 BUS (GPIB)

Authors	:	Eugene Fisher and C W Jensen
Publishers	:	Adam Osborne/McGraw-Hill
Suppliers	:	Audiogenic, P.O. Box 88, Reading, Berkshire
Pages	:	233
Page size	:	6.5" x 9.0"
Price	:	£9.95

This, in every respect, is a companion volume to the "PET/CBM Personal Computer Guide" reviewed last month.

From the same publishing stable; of the same page size and general production appearance; of the same high quality, clarity and understandability.

The only real difference in fact seems to be that this volume doesn't bear the words "Commodore Approved" on its front cover, nor anywhere inside that we could find.

Not, of course, that we'd want to suggest there may be anything in the book Commodore would prefer you not to know.

But given CBM's not-too-distant suspicion when asked to release any information at all, the authorisation on one volume, but not on the other - well, it makes one wonder.

First, let's clear one thing up: the acronym GPIB in the book's title. It stands for "General Purpose Interface Bus", and therein lies much of the book's content.

Quoting from the rear cover, the book sets out "whether you are an instrument designer, scientist, programmer, or PET computer hobbyist.....to tell you how you can have a low-cost, versatile system that may be interfaced to any of hundreds of electronic instruments."

This, it must be said immediately, the book does lucidly and well. What may be more to the point for many of our readers is that it also does it in a most enjoyable way.

There are over 65 diagrams and more than 30 tables in the book for which, for a book of 233 pages, is a lot: just about every other page, in fact.

Now this reviewer doesn't have any immediate need to interface anything to anything, beyond the already satisfactory interfaces he has now from PET-to-printer-to-disks.

Nevertheless, the book proved fascinating, and explained an enormous amount that simply wasn't clear previously.

And, of course, when an interface need arises (as it almost surely will, sooner or later), it's comforting to know the book is there on the shelf.

Perhaps the best section of all is contained within 4 pages very near the end of the book: a diagnostic test description and full program listing.

As the authors thoughtfully point out: "if communication difficulties occur .... you'll have nagging doubts that the problem could be with the bus hardware."

"Therefore we've written this diagnostic test to help you locate the problems, or at least alleviate your fears."

That last phrase sums up the whole book. We're happy to recommend it.

T.H.

THE PERSONAL COMPUTER BOOK

Author	:	Robin Bradbeer
Publishers	:	Input Two-Nine
Suppliers	:	Most bookshops
Pages	:	220
Page size	:	6" by 8.25"
Price	:	£5.25

Robin Bradbeer's book is well-written and immensely readable. It should also be required reading for many of PRINTOUT's main readers, notwithstanding the fact that they *have* a personal computer already.

The book is said to have been written "to explain the many possibilities for the personal computer - and also the pit-falls. It should be read before a single penny is spent on personal computer equipment and, when the penny has dropped, it will continue to be the essential reference book."

Disregarding the slight exaggeration of the final phrase, we see no reason at all to disagree with that summary.

We'd go further, however (and the publishers may well wish to change the rear cover's text, should a second printing be required).

We think that the book should also be read *after* quite a lot of pennies have been spent on personal computer equipment, to make sure that those pennies are proving a wise investment.

Why? The answer is found in Chapter Two, which is titled "Where Do I Start?", and sub-titled "10 Hints to Help You On Your Way".

We do not honestly think we've read, together in one place, ten hints quite as good as Robin Bradbeer has distilled.

We wish we had the space to reproduce them here (and maybe we will in a future issue).

From there on (though Chapter One's good too!), the book remains sensible; level-headed; realistic. But at the same time, it's imaginative, stimulating, and very, very informative.

We found one small irritant: the determined spelling of "disk" as "disc", when there's a world-accepted standard spelling (which Mr Bradbeer should certainly know), to differentiate the specialised computer disk from something that's simply round and flat.

But that's a small point against the general value which the book represents. The eight Appendices are, for instance, solid value by themselves.

They range from binary-octal-hex-ASCII codes; through UK manufacturers and computer clubs; include a most comprehensive list of UK/USA magazines and books on the general subject; and additionally take in a computer glossary, and some hints on DIY kit-building.

PRINTOUT is included in the magazines section, and we quote:

"Originally based around PET, but has started to introduce articles of interest to other 6502-based systems.

"It could probably evolve into the UK's version of Compute or Micro. Good programming tips and specialises in 'Commodore-watching' - with well-established contacts providing notable scoops!"

We quote that review only because it helps underline the up-to-date nature of the book.

While PRINTOUT will never, at any time, desert, dilute or diminish its PET coverage, Robin Bradbeer has clearly caught some overtones.

This is a book we recommend, and that's not because we have an 8-line mention. It's crisply written, stimulating to the imagination, and we think you're very unlikely to be disappointed with what you get.

G.S.

TOMMY'S TIPS

The North of England PET guru with the amazing knack of finding things about and in PET that no one else seems to know. As always, the odds-on bet is that something on this page will be useful to you.

TWO MINDS WITH BUT.....

Just as we were going to press last month, I had a demonstration of that weird phenomenon, when two separate people simultaneously arrive at a near-identical conclusion. One was 16-year-old Mark Valentine of South Elmsall in Yorkshire; the other was me.

Both of us, it turns out, have been playing with a routine to reverse instantly the field of every on-screen character, whichever state it was in before the reversal. Both of our routines are machine-coded, but differ slightly in approach. Mark's is called with our old friend SYS 826, while mine is operated with a brand-new POKE command. I may have a slight edge, because mine is happy with new or old ROMs, but I'll give you both, so that you can experiment.

Ready? Here we go then.....

TOMMY'S INSTANT REVERSAL

The code is called 60 times a second by the interrupt vector, located on new-ROM machines at hex 90 and 91. It tests to see if location 1022 has a 1 in it. If not, then it returns to service the interrupt; if it has, then there's a jump to the screen-inversion routine. In fact, with a bit of imagination (how about it, Mark?), the code from locations 033A to 0344 could be used to make your own POKE command.

For space reasons, I'm only going to give you the two hex dumps (one for new, and one for old ROMs), but this is enough to let you enter the routine direct, via the Monitor (new-ROM people, use your in-board one; sorry, old-ROM people will have to load it.)

After putting the routine in, you'll need to initialise it. For new-ROMs, type M 0090 0091 while you're still in Monitor mode. Then move the cursor over location 90 and type 3A, then over location 91 and type 03. Then press return, and type X and return to come out of monitor.

For old-ROMs, enter on one single line, as a direct command, POKE537,58:POKE538,3. Press return and you're initialised too.

From that point on, POKE1022,1 will invert the whole screen for old and new ROM machines, either from within a program, or called directly.

Now here are the two hex dumps you need:

```
NEW ROM HEX DUMP

033A AE FE 03 E0 01 F0 04 4C
0342 2E E6 EA A2 80 A0 00 84
034A 01 86 02 B1 01 49 80 91
0352 01 C8 D0 F7 E8 E0 84 D0
035A F0 A9 60 8D FE 03 4C 2E
0362 E6 00 FF 00 FF 00 FF 00

OLD ROM HEX DUMP

033A AE FE 03 E0 01 F0 04 4C
0342 85 E6 EA A2 80 A0 00 84
034A 01 86 02 B1 01 49 80 91
0352 01 C8 D0 F7 E8 E0 84 D0
035A F0 A9 60 8D FE 03 4C 85
0362 E6 00 FF 00 FF 00 FF 00
```

A final note for real machine-code enthusiasts: both routines use zero-pages 1 and 2. This means the USR function is impaired, but any zero location that's free can be used for LDX and Y instructions.

MARK'S INSTANT REVERSAL

Mark Valentine says he uses his reversal routine for flashing graphic displays on the screen, and either routine would be good for that. Mark's dad, mind you, is the owner of Yorkshire Electronic Services Ltd., in Morley, near Leeds.

Seems Mark actually writes some of the business software his dad's firm supplies to new customers. At just 16 therefore, Mark looks like he's got a bright future in computing! Except he has his eye on being an RAF pilot. Our loss is their gain!

Anyway, here's a hex dump of Mark's routine. Sorry, new ROMs only. Call it with SYS 826, and if you want to see the sort of dramatic effect you can get, try Mark's demo program, which follows the hex dump.

```
NEW ROM HEX DUMP

033A A0 00 A2 00 BD 00 80 18
0342 69 80 9D 00 80 E8 E0 00
034A D0 F2 EE 40 03 EE 46 03
0352 AD 40 03 C9 84 D0 E5 A9
035A 80 8D 40 03 8D 46 03 60

DEMO PROGRAM

10 FORI=1TO20
20 TX=TI:SYS826
30 IFTI-TX<36THEN30
40 NEXTI
```

PSST! WANNA LINE YOUR MONEY UP?

Here's a way of using the "user-defined function" you have in PET's Basic to line up decimal places - in money amounts, for instance.

Here's the program line you want:

```
DEFFND(X)=INT(LOG(ABS(X)+.001))/LOG(10)
```

Using the ABS function makes sure PET doesn't go mad trying to find the log of a negative number. And using "+.001" stops PET rummaging around, trying to find LOG(0).

If you use the defined function, just as I've given it above, together with the TAB function, you'll get beautifully formatted output.

As an example, let's make Y=45.78 and V=400.45. To make them line-up like Guardsmen, use program lines like these:

```
50 PRINTTAB(12-FND(V));V
60 PRINTTAB(12-FND(Y));Y
```

Go on - use it! Strike a blow for better layouts today!

TOMMY'S TIPS

Continued

PRESTO! INPUT BECOMES DATA!

How would you like to change anything entered in answer to an INPUT statement earlier in a program, into a DATA statement later in the same program?

I'll leave it to you to work out uses for the method, but I can think of several, and I'll mention a few in a minute, just to get your imaginations going. And the method works on all PETs, old and new ROM. Hooray!

First, you're going to need a subroutine to tack onto your program, and here it is. Please note that you must enter it exactly as you see it here.

```
5 PRINT"■WHEN INPUTTING DATA USE / AS LIMITER,"
10 PRINT"■NOT , - PROGRAM WILL CORRECT THIS."
15 INPUT"■■FIRST DATA LINE NUMBER";A
20 A=ABS(INT(A))
25 IFA<1000THEN15
30 INPUT"■ENTER DATA   *■■■■";F$
35 IFF$="*"THEN90
40 A$=F$:F$=""
45 FORX=1TOLEN(A$):D$=MID$(A$,X,1)
50 IFD$="/"THEND$=","
55 F$=F$+D$:NEXTX
60 PRINT"■■■"
65 PRINTA;"DATA";F$
70 PRINT"A=";A;"+10:GOTO30"
75 IFPEEK(50500)=0THENPOKE525,2:POKE527,13
80 IFPEEK(50500)=0THENPOKE528,13:PRINT"■":END
85 POKE158,2:POKE623,13:POKE624,13:PRINT"■":END
90 REM PUT THE REST OF YOUR PROGRAM HERE.
```

You might like to note some things about the listing. First, line 30 has three cursor lefts to make sure you don't drop out of the program.

Second, lines 45 to 55 check the input string for "divide by" slashes, changing any to commas for the DATA statements; this lets you have more than one DATA statement on each line.

Third, line 60 is a clear screen and two cursor downs.

Finally, the END statements in lines 80 and 85 are very important, so don't leave them out.

Now, what can you use the program for? Well, how about those long machine language programs you see, where there are hundreds of DATA items to be laboriously typed in? Or what about using it as a database builder, to store long lists of addresses, or gramophone record details, or book references, or whatever?

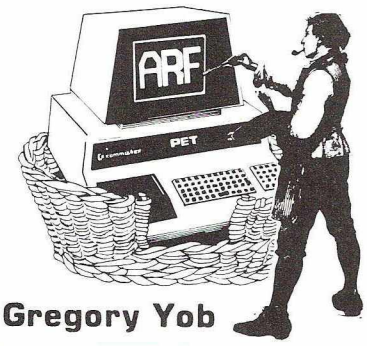
To get out of the subroutine, after your entries are complete, just type a return over the asterisk, and you'll jump into the main program at line 100.

One last important point: if you want to make entries in lower-case, be sure to enclose them in quotes. If you don't the program will expand them to key-words!

Next month, Julian Allason will be using this method in a Mailing List program that works without the need for disks. We will be printing the full listing, of course.

That's all for now though. Have fun!

Personal Electronic Transactions



by Gregory Yob

The DATA Pointers

As you know, the RESTORE statement makes the PET's DATA statements all "new" again — that is, the READ pointer is moved to the start of the Basic program. Sometimes it is nice to be able to re-read some DATA without starting all over. In some Basics, the RESTORE-nnn statement does this — for example, RESTORE 345 will move the DATA pointer to Line 345. Let's see if this can be done for the PET.

The first thing is to take a look at the PET's DATA pointer and see how it changes as DATA items are read. Enter this small program and then RUN it:

```
10 DATA 1,2,3,4,5,6,7,8,9
20 DATA 10,11,12,13,14,15
30 DATA 16,17,18,19,20,21
40 DEF FNX(X)=PEEK(X)+256*PEEK(X+1)
50 PRINT
60 PRINT"DATA POINTER AT:"FNX(144)
70 READ Z:PRINT Z
80 GETA$:IFA$=""THEN 80
90 GOTO 50
```

(If your PET has the "new" ROMs, use FNX(62) in Line 60. The later POKEs to 144 and 145 should be changed to 62 and 63, respectively.)

```
RUN
DATA POINTER AT: 1024
 1

DATA POINTER AT: 1032
 2

DATA POINTER AT: 1034
 3
.... etc ....
```

As you press the SPACE key repeatedly, the data pointer moves along in the Basic program.

When the data item moves from 9 to 10 (which will be 10 to 11 on the screen), note how the pointer jumps a bit. We have just moved past a line in Basic, and four bytes are used to hold the line pointer, the line number, and three for the end-of-line zero, the DATA token and the space. Then there are two bytes for the ",9" part of the line. Now pressing SPACE will move the pointer in increments of 3 (,11 then ,12 and so forth).

Now a minor change:

```
85 POKE 144,0:POKE145,4
```

If the program is RUN again, the data item remains at 1 and the pointer is "frozen" at 1024.

This is **wonderful!** To set the DATA pointer, all we have to do is to POKE the pointer to the zero at the end of the preceding line. (Note: A PET Basic line is composed of: 2 bytes to point to the next line in low/high format, 2 bytes for the line number in low/high format, the program text in tokenized form and the value zero. Then a new line begins. The PET's DATA pointer expects to see either a comma or the zero before a line — so location 1024 at the start of all Basic programs must be a zero. If you are a hacker, zero is the 6502 BRK instruction, and that's how SYS 1024 starts the Monitor in "new" ROM versions of the PET.)

A few changes and additions to our program does the trick:

```
Lines 10-40 - remain the same
50 PRINT "WHICH LINE TO START DATA AT?"
60 INPUT LD
70 GOSUB 1000
80 READ Z: PRINT Z
90 PRINT"PRESS KEY TO GO ON"
100 GET A$:IFA$=""THEN 100
110 GOTO 50

1000 REM GIVEN LD, POKE THE DATA POINTER
1010 REM TO SIMULATE RESTORE-NNN FOR LINE LD
1020 REM REQUIRES DEF FNX(X)=PEEK(X)+
     256*PEEK(X+1) PRIOR TO THIS ROUTINE
1030 LP=1025
1040 LN=FNX(LP+2)
1050 IF FNX(LP)=0 THEN PRINT"LINE NUMBER
     TOO LARGE":END
1060 IF LN>=LD THEN 1100
1070 LP=FNX(LP)
1080 GOTO 1040
1100 LP=LP-1
1110 PA=INT(LP/256)
1120 PB=LP-PA*256
1130 POKE 144,PB: POKE 145,PA
1140 RETURN
```

If you RUN this program, you will see that the value for Z will correspond to the first item of the DATA statement you specify in response to the question in Line 50.

If you just want to use this program, copy the routine at 1000 as required and feed it the value LD for the line you want to RESTORE to.

The explanation of Routine 1000 goes like this: Line 1030 sets the line pointer LP to the first pointer in the Basic program, which is at location 1025. Line 1040 computes the line number. (If you want to watch the search as Routine 1000 runs, insert: 1045 PRINT LP,LN.)

The last line in a Basic program will have a pointer pointing to a null pointer whose value is zero. The next pointer is given by FNX(LP), so this is checked for the end of the program. Line 1050 takes care of this.

Line 1060 checks for the line to restore to. The routine is forgiving in that if LD doesn't match the line number, the next largest line number is used. You can change this by using = instead of >= . Line 1070 moves LP to the next line, and we repeat to look further.

Line 1100 uses the fact that the DATA pointer is to be positioned just before the line of interest — where there is always a handy zero. (Failure to do this gives you a ?SYNTAX ERROR when the READ is attempted.) Lines 1110 and 1120 compute the High/Low values, and Line 1130 does the dirty deed. "New" PETs should use 62 and 63 here.) Now we are done.

If you try the program out, you will get ?OUT OF DATA ERROR IN . . . for lines over 30 — a moment's thought will tell you this is correct, for there isn't any data after Line 30. If you try some line like 2000, Routine 1000 will complain. (You don't really want the DATA pointer off into Outer Space anyway.)

Let me know if this program is of any use . . .

HANGMATH — A Lesson in Program Modification

Jack Rossum sent me a program, HANGMATH, and asked for my comments. As with many programs, a lot of work remained to be done if the program were to be distributed commercially. Since many of you out there have a program or two which could be transformed into commercial software, here is a step-by-step "case study" of how this might be done.

For starters, I asked Jack if the program idea was originally his. The original version of HANGMATH appeared in the April 1977 issue of Kilobaud Microcomputing, page 112. I feel it is important to know the original author's name and to include it in any modified versions. (Some of you may have played a game called Wumpus — do you know who originally wrote it?)

The next step was to play the game and see how I felt about it. A listing of the original version is shown below:

```
4 REM BY J.R. ROSSUM(MAY 2 1979)
10 PRINT"clr":INPUT"DO YOU WANT INSTRUCTIONS"
     ;A$
20 IF LEFT$(A$,1)="N"THEN 80
30 PRINT"clr sp sp sp THE DISPLAY REPRESENTS
     THE MULTIPLIC-ATION OF A THREE";
40 PRINT "DIGIT NUMBER BY A TWO sp sp
     DIGIT NUMBER.EACH LETTER REPRESENTS A sp";
50 PRINT "sp sp DIGIT. THE OBJECT IS TO
     GUESS THE VALUE OF EACH LETTER IN
     THE sp";
60 PRINT"IN THE FEWEST sp sp sp sp sp TRIES."
65 PRINT"FOR A LIST OF YOUR GUESS'S TYPE
          'L,0'. sp sp sp sp sp sp sp sp
        NOW,WAIT FOR DISPLAY"
70 U=0:T=0
80 DIM U(16)
90 DIM N(4),A(4,5),B(4,5),C(4,5),E$(4,5),
     V(12,10)
92 FOR A=0TO12:FORB=0TO10:V(A,B)=0:K(B)=-1:
     Q$(B)="":NEXT:NEXT
100 W=0:F$="":R1=RND(-TI)
110 C$="ABCDEFGHIJ"
120 R=INT(LEN(C$)*RND(1)+1)
125 N$=MID$(C$,R,1):F$=F$+N$
130 IF R>1 THEN T$=LEFT$(C$,R-1):GOTO 150
140 T$=""
150 C$=T$+MID$(C$,R+1)
160 IF LEN(C$)>0 THEN 120
162 PRINT:PRINT
170 IF LEN(F$)<>10 THEN 100
180 PRINT:PRINT
210 N(0)=100+INT(900*RND(1))
220 N(1)=10+INT(90*RND(1))
230 N(2)=N(0)*(N(1)-10*INT(N(1)/10))
240 N(3)=N(0)*INT(N(1)/10)
250 N(4)=N(0)*N(1)
260 FOR X=0 TO 4:C=0:FOR Y=1 TO 5
270 A(X,Y)=INT(N(X)/INT(10↑(5-Y)))
272 B(X,Y)=A(X,Y-1)
274 C(X,Y)=A(X,Y)-10*B(X,Y):
     E$(X,Y)=MID$(F$,C(X,Y)+1,1):C=C+C(X,Y)
```

PET, cont'd . . .

```
280 IF C=Ø THEN E$(X,Y)=""
290 NEXT:L(X)=LEN(STR$(N(X))):NEXT
300 PRINT
400 FOR X=Ø TO 4: FOR Y=1 TO 5
402 T=20
404 IF X=3 THEN T=18
410 PRINT TAB(T-L(X));E$(X,Y) ;"SP";
420 NEXT:IF X=1 OR X=3 THEN PRINT:
    PRINT;TAB(13);" E E E E E E E E E E"
       (ten SHIFT-E)
430 PRINT:NEXT:PRINT

500 INPUT"LETTER,NUMBER";Z$,N
502 IFN=K(N)THENPRINT:PRINTTAB(15)
    MID$(F$,N+1,1);"sp ="N;
    ",DUMBO":PRINT:GOTO500
504 IF Z$=Q$(N) THEN PRINT:PRINT "YOU
    GUESSED THAT BEFORE":PRINT:GOTO500
512 IF Z=76 THEN 534
514 V(Z-65,N)=16*Z+N+1
520 IF Z$=MID$(F$,N+1,1) THEN 600
530 PRINT "NUMBER WRONG IS"W+1:
    W=W+1:Q$(N)=Z$
532 GOTO 500
534 GOSUB 800

600 N1=50:FOR X=Ø TO 4:FOR Y=1 TO 5
610 IF E$(X,Y)=Z$ THEN E$(X,Y)="1ft"
    +STR$(N):K(N)=N
620 IF E$(X,Y)="" THEN 680
630 M=ASC(E$(X,Y))
632 IF M=157 THEN M=Ø
640 IF M>N1 THEN N1=M
680 NEXTY: NEXTX
682 IF N1<60 THEN 700
690 PRINT: GOTO 400
700 PRINT:PRINT TAB(15)"**********"
    :PRINT:PRINT TAB(15);"YOU HAVE IT"
710 PRINT:PRINT TAB(13);"NUMBER WRONG="W
720 T1=T1+W:U=U+1:T2=T2+W*W
730 PRINT:PRINTTAB(10)"AVERAGE AFTER"U
    "GAMES IS"T1/U
740 PRINT:IF U>1 THEN PRINT "STD.DEV="
    SQR((T2-T1*T1/U)/(U-1))
750 PRINT:PRINT:INPUT"sp sp sp sp sp sp.
    ANOTHER GAME";B$
760 IF LEFT$(B$,1)="Y" THEN 92
770 END

800 FOR K=0 TO 9:PRINT CHR$(65+K);
    :FOR P=Ø TO 10
810 X1=INT(V(K,P)/16):Y1=V(K,P)-16*X1
820 IF Y1-1=P THEN 828
824 PRINT "sp sp sp";
826 GOTO 830
828 PRINT Y1-1;
830 NEXT:PRINT:NEXT:PRINT
840 RETURN
```

(Note: For this column I have typed numerous programs which I have written. It was quite a surprise to find how difficult it is to type a program written by someone else — whose style is very different from mine!)

If you really want to "feel" this program, be sure to enter it and play a few rounds. Then my comments will make more sense. Several complaints immediately appeared:

1) No title page.

2) The program is not "input-proof." A RETURN will kill the program.

3) The instructions are exceedingly terse and hard to read. There is even a typographical error. The "Press Key To Continue" convention isn't followed.

4) The screen scrolls up as you enter most guesses. Only a correct guess will restore the display.

5) The entry of a guess is somewhat clumsy.

A close look at the program's code is yet another revelation. My first inclination is to entirely redo the program from scratch — but that isn't very instructive. If you are a professional programmer, the situation of modification of another's code is very common — and very frustrating.

The code is obviously much-modified as the unusual line numbers indicate. There are no comments, so changing the program will be the solution of a puzzle as well. Several programmer's short-cuts can be applied, for example, PRINT"dn" to replace PRINT:PRINT can be used in 10 different places.

First things first — let's clean up the instructions and provide a title page for all of the credits. If you look at Lines 30 to 65, the PRINT statements are all "stuck together" — if you change Line 30, Lines 40 and 50 will also be influenced. My own preference is one line of display per PRINT statement to make editing simple. Here are the changes for title and instructions:

```
Lines 4 through 65 - delete
10 REM HANGMATH PROGRAM
20 REM SEE TITLE PAGE FOR CREDITS
30 GOSUB 1000
40 GOSUB 2000
50 GOTO 50

1000 REM TITLE PAGE
1010 PRINT"clr HANGMATH
1020 PRINT"dn dn ORIGINAL AUTHORS:
1030 PRINT"dn sp sp PHIL FELDMAN
1040 PRINT"sp sp TOM RUGG
1050 PRINT"sp sp (APRIL 1977 KILOBAUD,
     PG 112)
1060 PRINT"dn dn MODIFICATIONS BY:
1070 PRINT"dn sp sp J. R. ROSSUM
1080 PRINT"dn dn MORE CHANGES BY:
1090 PRINT"dn sp sp GREGORY YOB
1100 RETURN
2000 REM INSTRUCTIONS
2010 PRINT"dn dn dn INSTRUCTIONS? sp";
2020 GOSUB 3000
2030 IF A$<>"Y" THEN RETURN
2040 PRINT"clr HANGMATH -INSTRUCTIONS-
2050 PRINT"dn dn sp sp HANGMATH WILL
     PRESENT YOU WITH A
```

PET, cont'd...

```
2060 PRINT"MULTIPLICATION PROBLEM WHICH
     HAS THE
2070 PRINT"DIGITS REPLACED BY LETTERS.
2080 PRINT"dn dn FOR EXAMPLE:dn"
2090 PRINT"      A B F          4 5 6
2100 PRINT"    X   E D        X   3 2
2110 PRINT"     ------         -------
2120 PRINT"      H C D          9 1 2
2130 PRINT"  C E F I          1 3 6 8
2140 PRINT"  ---------        ---------
2150 PRINT"  C A B H D        1 4 5 9 2
2160 PRINT"dn dn sp sp HERE THE LETTER
     'A' IS THE DIGIT 4
2170 PRINT"THE LETTER 'H' IS THE DIGIT
     9 AND SO
2180 PRINT"ON.
2190 GOSUB 3100
2200 PRINT"clr -MORE INSTRUCTIONS-
2210 PRINT"dn dn TO ENTER A GUESS, JUST
     TYPE THE
2220 PRINT"LETTER AND NUMBER. FOR EXAMPLE,
     'A4'
2230 PRINT"AND '4A' WILL BOTH WORK FOR
     MATCHING
2240 PRINT"THE LETTER 'A' WITH THE DIGIT
     '4'.
2250 PRINT"dn sp sp IF YOU ENTER 'Q' THE
     SOLUTION WILL
2260 PRINT"APPEAR.
2270 GOSUB 3100
2280 RETURN

3000 REM INPUT ONE CHAR
3010 PRINT"rvs V lft";:FORJ=1TO100:NEXT
3020 PRINT"off sp lft";:FORJ=1TO50:NEXT
3030 GETA$:IFA$=""THEN3010
3040 RETURN

3100 PRINT"dn dn PRESS ANY KEY TO CONTINUE";
3110 GOSUB 3000: RETURN
```

Note that lines 2090 to 2150 do not include the spaces as 'sp.' It is more important to see how the display appears on the screen. Assume each blank in these lines is to be entered.

The character used in 2110 and 2140 is SHIFT-@. The 50 GOTO 50 is simply a convenience to see how the display appears. It will be removed later.

You can see that these instructions, though much longer, are much more clear than the original ones. The proper credits are in place on the title page, and some examples are present to tell the user what to expect. We have also included the utility routines at 3000 and 3100 to remove the INPUT/RETURN problem. Now a single keypress will take care of Y/N and other simple inputs.

A more subtle feature is the removal of A,1 by A1 or 1A when entering guesses. Since this isn't done yet, let's go ahead and do it! (Of course I had to keep this in mind while rewriting the instructions.)

```
500 GOSUB 3200: IF F THEN PRINT "QUIT":END
50 (delete)
70 U=0:T=0:PRINT"clr SETTING UP ....
400 PRINT"clr":FOR X=0 TO 4: FOR Y=1 TO 5

3200 REM GUESS ENTRY
3210 REM GET 2 CHARS
3215 PRINT"dn
3220 F=0:Z$="@":N=-1
3230 PRINT"YOUR GUESS: sp";
3240 FOR K=1 TO 2
3250 GOSUB 3000:PRINTA$;
3260 IF A$="Q" THEN F=1:RETURN
3270 REM FORM Z$,N
3280 IF A$>"@" THEN Z$=A$: GOTO 3300
3290 N=ASC(A$)-48
3300 NEXT K
3310 REM CHECK FOR VALID
3320 IF N<0 OR N>9 THEN 3350
3330 IF Z$<"A" OR Z$>"J" THEN 3350
3340 PRINT: RETURN
3350 PRINT:PRINT"up BAD LETTER OR NUMBER"
3360 FOR J=1 TO 500: NEXT
3370 PRINT"up 21 spaces"
3380 PRINT"up";:GOTO 3220
```

Line 500 was the original INPUT statement for Z$ and N. A GOSUB to the guess entry routine was put here instead. The test for F is to see if the "Q" option was used. For the present, a simple report is inserted, and later a jump to the solved problem will go here.

Line 70 is a nicety — HANGMATH takes some time to set up a problem, so the screen is cleared and the user told about it. Rather than scrolling the problem each time it is written, the screen is cleared in Line 400.

Routine 3200 fetches the guess and converts it into the expected Z$ and N. A few tricks are used to insure that the correct values for Z$ and N are entered, and to report errors without more scrolling of the screen. Line 3220 sets Z$ and N to illegal values — after all, the player might enter 'AA' instead of A1. Line 3250 gets the letter in A$, and Lines 3280 and 3290 try to convert A$ to Z$ or N.

In 3310, N and Z$ are checked for 0-9 and A-J, the legal values. An illegal value causes the BAD LETTER OR NUMBER to be written over the YOUR GUESS for a short while (Line 3360 to adjust that, you might use 1000 for children) and then an entry is attempted again. By careful use of Cursor-UP, the lines don't scroll. Note the "erase" Line 3370 to clear the error message.

PET, cont'd...

If you now try the new HANGMATH, a fair improvement is seen. The screen still scrolls due to some of the messages, and the L,0 will no longer work — but a nicer appearance is already evident. Now to attack these details:

```
70 U=0:T=0
91 PRINT"clr SETTING UP ..."
400 PRINT"hm HANGMATH sp sp sp sp sp sp sp";
402 FOR X=0 TO 4: FOR Y=1 TO 5:T=20
502 IF N=K(N) THEN M$=MID$(F$,N+1,1)+
    "sp ="+STR$(N)+", sp DUMBO":
    GOSUB3500:GOTO 500
504 IF Z$=Q$(N) THEN M$="YOU GUESSED THAT
    BEFORE":GOSUB3500:GOTO 500
530 W=W+1:M$="*** MISSED *** YOU ARE DOWN
    "+STR$(W):Q$(N)=Z$:GOSUB3500
532 GOTO 500
420 NEXT:IFX=1 OR X=3 THEN PRINT:PRINT
    TAB(13)" @ @ @ @ @ @ @ @ @ @ up"
710 PRINT:PRINT TAB(13);"YOU WENT DOWN"W
730 PRINT:PRINTTAB(7)"AVERAGE AFTER"U
    "GAMES IS"T1/U
740 (delete this line)
750 PRINT"dn dn ANOTHER GAME? sp";:GOSUB3000
760 IF A$="Y" THEN 91

3500 REM TEMP MESSAGES DISPLAY
3510 REM USING M$
3520 PRINT"dn dn"M$
3530 FOR J=1 TO 2000:NEXT
3540 PRINT "up          39 spaces
3550 PRINT" up up up up up up up"
3560 RETURN
```

Most of this is simply "clean-up" work. Line 91 is inserted to do the function of the SETTING UP . . . which was previously in Line 70. This is a consequence of Line 760 which has to avoid the DIMs in 80 and 90. Line 400 is arranged to print the program name and to obliterate the end of the SETTING UP . . . message which is still on the screen. We use Home Cursor here to avoid blinking the display while it is re-drawn. Lines 502, 504 and 530 use a new routine, 3500, which displays a message briefly and then erases it. This keeps the screen neat. Line 420 cleans up the display of the problem to match the examples in the instructions. Lines 710 to 740 change the end-of-game display a little. I can't see that the standard deviation will help a HANGMATH player. Line 750 makes use of the utility routine 3000.

This completes the "cosmetics" for HANGMATH. There are still some annoyances:

1) If an all-zero line appears in the multiplication, it will be printed as blanks.

2) There's room for the past guesses report on the screen.

3) If this game is to be called HANGMATH, the HANGMAN theme should be used.

4) The Quit option isn't implemented.

I shall leave these final tasks up to you (send me your tape if you do anything on these), with a few suggestions on how to proceed.

First, N(1) is the lower multiplier (see Line 250). To remove the zeroes problem, just force N(1) to **not** be an even multiple of 10. For example, 255 IF 10*INT(N(1)/10)=N(1) THEN 250 should do the trick.

Subroutine 800 provides a clumsy "past guesses" report. This could be printed on the screen below the area reserved for the messages after entry of guesses. (That's 4 lines below the YOUR GUESS: line) Warning! At the end of the game the game report will write onto the same space, so some changes in the 700 area are in order.

Line 530 keeps track of the misses. A GOSUB 4000 could be used to keep track of the mistakes and provide a M$ suitable for each miss. For example,
W=1 gives YOU LOST YOUR HAND
W=2 gives YOU LOST YOUR OTHER HAND
and so on. W=12 to lose the game . . .

One last thing . . . there's still a bug in HANGMATH. If your first guess for a letter, such as C, was successful, further guesses for C will not evoke the DUMBO message, (i.e., if you got C8 successfully, tried C7 previously, but hadn't assigned letters for 4,5 and 6, HANGMATH will give you a *** MISSED *** for C4, C5 and C6. The correct response is the DUMBO message.)

I hope this helps you with future programs. It all comes down to two major points:

A. The screen display must be neat and clear.

B. The user's input must be foolproof, simple and appropriate to the current level of the game. □

LITTLE GENIUS -Not Proven!

Little Genii: Peter Brown and John Baldachin

New, and sometimes not-so-new, PET owners are often desperate to improve their knowledge. "Little Genius" tutorial diskettes say they can do it. We investigate their claims.

It's our normal custom to review software in the way established in PRINTOUT an issue or two ago, if the software is normal - that is, a program or programs intended to fulfil a specified data processing aim. Clearly we're then able to comment on the software's ability to fulfil that aim; the manner by which it goes about it; the absence or otherwise of bugs; the likely usefulness to a range of possible users; and the value for money which, in our opinion, the software represents.

Equally, it's our custom to review books differently, in that we touch on the contents; their completeness against the author's or authors' seeming aims; the book's likely usefulness to potential readers/users; and, of course, the value for money aspect.

It's hard to know how to approach "Little Genius" since it's effectively a software book available, as far as PET-owners are concerned, on two (or possibly three) diskettes. We ask you to note the spelling of that last word, since we'll return to it shortly.

The two diskettes purport to teach you "how to use your system, and how to realise the full potential of the Mighty Micro.....guiding you quickly to a high level of understanding and confidence in your ability to make the most of your microcomputer system."

We think it fair to do a hybrid review of Little Genius, since a software review wouldn't touch adequately on the range and extent of Little Genius' most important aspect, that of teaching; while a book review would ignore the software aspects of the method by which the teaching is attempted.

First, how much will Little Genius cost you, and why an uncertainty about the number of diskettes available?

Each Little Genius diskette costs £45 plus VAT, which brings the total per diskette to rather more than £50. There are two diskettes featured in Little Genius' advertising: "PET Basic" and "Advanced PET Basic".

We've reviewed one only - "PET Basic" - but a lengthy section at its end is devoted to advertising the second diskette, "Advanced PET Basic", and additionally mentions a third, entitled "Using Your PET".

Since the advertising describes the contents of the other disks, we're able to comment on what they're said to contain. We can't, however, say whether the third is available. When you've read this review, you may nevertheless be able to conclude whether you want to enquire further from your local dealer, or the suppliers, on its availability.

The tutorial method employed by Little Genius involves first loading the diskette, following instructions on the single sheet of paper with which the diskette is accompanied. Since Little Genius is the first and only program on the diskette and the pupil is specifically instructed to place it in Drive 0, we found it odd that the pupil should then be told to go through the rigmarole of opening a file, initialising the diskette, and finally using the asterisk load method for the first program.

Once this has been completed, however, a pretty display of graphics follows, employing the words "LITTLE GENIUS". A while later, the instruction begins via a menu, of which there are a considerable number throughout all the remaining instruction processes.

The first menu offers the pupil a choice of "Hello And Welcome", "Meet The Commodore PET", "Basic For Beginner's" (the latter word being spelt exactly as shown), "Extending Your Basic" and "Further Information".

We can deal with the last of these choices immediately - it is devoted exclusively to the advertising, already mentioned above, of the other two disks. There are thus four apparently useful sections available to the pupil, since advertising is not teaching, within the meaning of the word.

We can also deal with the first section, since it consists of instruction, at what might be felt to be very considerable length, not on PET but on how to use Little Genius. It might possibly be thought that this usage of space represents a considerable part of the buyer's investment, and does little or nothing to help his understanding of PET.

The first section also produces some basic (with a small "b") English errors which are not likely to increase the pupil's confidence if he is even part-way literate. The possessive "its" is, for instance, fairly consistently spelt "it's", while other contractions, such as "doesn't" appear as "does'nt", "Disk" is spelt "disc" throughout, but there is no hesitation about using the word "diskette". Why not "discette", we wonder?

More intriguingly, there is a further error, directly relevant to the length of the Little Genius course; something which the pupil has paid £45 + to obtain. This occurs in that part of the first section which says "You will have noticed

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that there are six major sections". We noticed no such thing. There are five, of which the last is advertising, and the first simple course usage instruction. Something is wrong somewhere.

The teaching throughout is presented three lines at a time, printed letter by letter, scrolling left to right across the screen. Thus merely learning how to use Little Genius in the first section occupies a considerable time. This is not simply because the three-line, letter-by-letter scroll takes about 12 seconds to accomplish. After the three lines are printed, the pupil has then and always to press the space bar. This causes the disk to search for the next three lines which, when found, are in turn slowly scrolled across the screen, and so on. The net time investment is considerable.

We are now really left with what might be called (perhaps charitably, if the intention is to teach PET Basic) the meat of the first Little Genius diskette - the three centre sections. We possibly need to make one observation only here: the end of the final section, before the advertising begins, gets as far as GOTO and GOSUB. To be sure, it is the area of qualified GOTO and GOSUB, but that's it.

The next diskette, entitled "Advanced PET Basic" for which the pupil will pay another £45 or so, promises to take him or her into the realms of WAIT, PEEK, POKE and so on.

It also says that it will teach the pupil how, for instance, to disable the STOP key, an art which might usefully have been applied to the Little Genius diskette under review. The people on whom we tested the course invariably pressed STOP at some point or other, thus involuntarily dropping out, to coin a phrase.

We were irresistibly led to conclude that there are information sources from which PET Basic and general usage can be learnt which are considerably less expensive and, at the very least, similarly informative.

One of the last lines on Little Genius said "Congratulations on having got this far". We felt we'd earned them.

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