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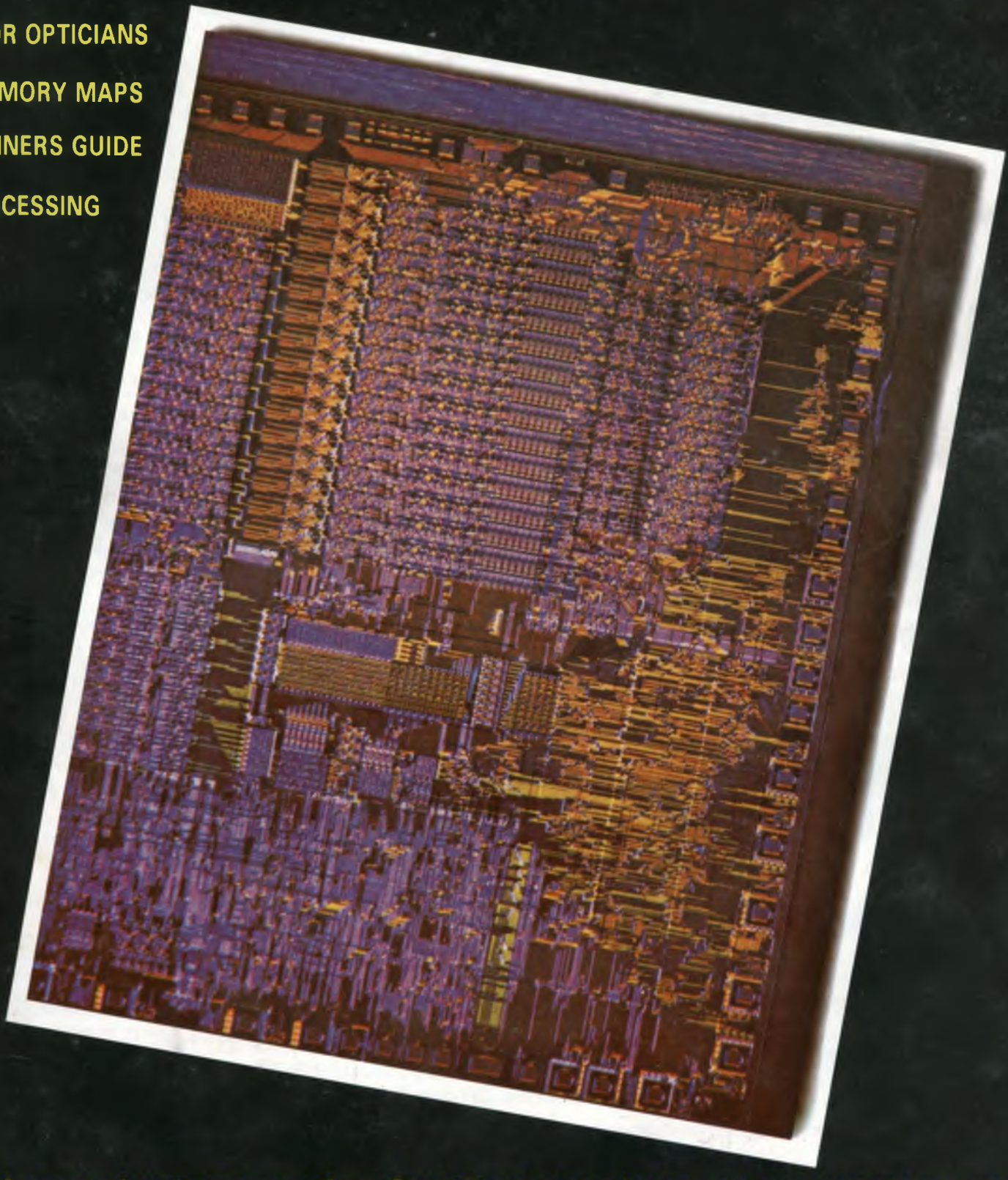

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CONTENTS

EDITORIAL

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We will pay 10 pounds for each program printed, and 20 pounds for each article published, which should be approximately 1,000 words long.

Christmas 1982 will probably see the biggest ever sales of personal computers, both in the UK and USA. Machines purchased will come from many different manufacturers, Commodore in the UK are expecting to sell over 30,000 VIC 20 machines.

What will these machines be used for?

Will their owners simply play games, or will they learn to use the machine and write their own programmes? On the answer to this question depends the future of the personal computer industry. If the machines are used only to play games then the future must be rather bleak, people will in general tire of these games and the machines will end up in cupboards forgotten like so many other novelties. On the other hand if the owner becomes interested in the machine as a computer, rather than a toy, then the industry can look forward to a long and interesting future. A future where a large percentage of the population will acquire a degree of computer literacy. To acquire this literacy owners will need a lot of help, Commodore Computing International aims to supply that help by giving its readers as much in depth information, at all levels of expertise, as possible, with particular emphasis on program listings. Examining how others have written a particular program is one of the best ways of learning.

We wish all our readers in over 46 countries a Happy Christmas and good programming in the New Year.

Letters

We wrote and asked a number of colleges known to have Commodore equipment just what they were doing with the kit. Here's a fairly typical reply, from Middlesex Polytechnic.

Dear Sirs,

The Polytechnic indeed have many Commodore machines (amongst others!), spread over several sites in North London. I am co-ordinator of the Enfield site users group. Our microcomputer classroom houses eight 8032 micros, two 8050 disk units and two printers, a 4022 and an 8026, linked together by the MUPET system.

The micros are used for a variety of educational and research purposes, ranging across civil engineering, mathematics, statistics, business studies and social science (as well as computing!). My own interest is in developing software for teaching economics and statistics, and at present organising elementary courses for potential staff users at this site of the Polytechnic.

I hope this brief outline meets with your requirements and look forward to hearing from you again.

Yours sincerely
A. Gully

Dear Mr. Gully

Thanks for the info, and yes you will be hearing from us again! The main reason for printing this letter is simple. If you are in a school, college or university using Commodore microcomputers we'd like to hear from you: what you're doing, what the kit is used for, and so on. Reflecting the fact that a large number of our subscribers are in the field of education, we're going to be expanding future issues to include much more educational coverage, and we want you to be involved as much as possible. So, put pen to paper, and I hope to be hearing from you!

Dear Sir,

May I belatedly thank you for the tape copy of Tinymon, which arrived when I was on holiday. I am pleased to report that this worked without any difficulty. Verifying my tape against the program listing in the June issue gave a Verify Error, suggesting that something was wrong somehwere, but a byte by byte comparison failed to reveal where the error lay.

However, life is too short to worry any further now I have a working and very useful Tinymon program. Many thinks for your assistance.

Yours sincerely
R. W. Moore
Sutton Coldfield

Dear Mr. Moore,
Your kind words are appreciated! A number of you have had troubles with Tinymon, whilst others appear to have entered it without any problems whatsoever! Who knows what the problem is? Hopefully you'll have had no such difficulties with Supermon for the Vic from our October issue.

Dear Sirs,

I read with interest the letter in a recent issue of Commodore Computing regarding Vic programs and loading into the Pet for listing to a printer. The simplest way to load the program is by using 'Toolkit'.

First, load a dummy program into the Pet. For example—:
1 REM.

Then APPEND the Vic program to the dummy, and then delete dummy if required. It will then LIST like a Pet program, and even sometimes RUN. This way, it doesn't matter which Vic expansion has been used, as the Pet will sort out the correct linking while Appending.

Yours faithfully
John Bloore
Kingswinford

Dear John,
Thanks for the tip. Although we haven't tried it, I think it's fairly safe to assume that the same trick will work on any sort of Toolkit-like program that has an Append command: Basic Aid, or whatever.

Dear Sirs,

The Commodore Information Centre told me that the magazine Commodore Club News is now being published by Nick Hampshire Publications, and that it now goes by the title Commodore Computing. They also told me that subscriptions to the magazine are now handled by your company.

So, I enclose a cheque for one year's subscription.

Incidentally, there was in fact a club or society of some sort behind the original magazine i.e. some organisation providing facilities/services to its members. If so, is this still run by Commodore or has it been transferred to your company (Nick Hampshire Publications)? My letter from Commodore was not very explicit on whether or not there exists an OFFICIAL club/society for users of their computers. Perhaps you could enlighten me?

Yours faithfully
M. L. Snowden
Beeston

Dear Mr. Snowden

Thanks for your subscription cheque: we hope you enjoy the magazine.

I've had to answer this question often enough for it to deserve mention here. Incidentally, I agree with you on the subject of the letter from Commodore: we produce the magazine, and it left me confused!

The magazine was produced by what was then known as the Commodore Pet Users Club (hence one of its early names: CPUCN, the N being for Newsletter), and continued to be so until January of this year, when the last issue came out. At Nick Hampshire Publications we simply took over the running of the magazine and NOT the User Group. That User Group sadly has appeared to die a death, and so the only sort of service Commodore now provides to the people that actually keep it in business is the aforementioned Information Centre.

However, all is not lost. There exists a nationwide Independent user group (I.C.P.U.G.), which is perhaps a better thing: independently run and independent in its comments, although it too can be overtaken by internal wrangles from time to time.

For instance: why all the sour grapes, Mike Todd? I will not defend Vic Revealed, but surely your pages in the ICPUG newsletter can be put to better use than simply slagging it off every month. Or is it due to the fact that you were going to bring out a very similar book but were beaten to it, I wonder.

Still, we digress. Apart from minor issues like the above, I can thoroughly recommend ICPUG as a body to belong to if you own/use any of the Commodore family of hardware, and so a quick letter to Mrs. Eli Pamphlett (7 Lower Green, Tewin, Welwyn, Herts.) will bring you the address of the nearest group to you. Mr. Snowden. You will not regret the cost of a stamp.

And speaking of ICPUG, we have now the editor of their newsletter, Ron Geere!

Dear Pete (ed. note: an old drinking companion!)

The item in the July issue Bits and Pieces (page 36) describing how to suppress the Input prompt is machine dependent. The zero-page location in question is one of the few which differs between Basic 2.0 & 4.0. For Vic 20 users it would be location 19.

This problem may be eliminated by replacing the line POKEing the off-normal flag to 1 by OPEN1,0,0 and the POKE to zero by CLOSE1. This method treats the keyboard as a peripheral device (0).

Yours sincerely
Ron Geere
Farnborough

Dear Ron,

Thanks for the tip: as ever, we're grateful to any readers who follow up an original article and then take it several steps further. A good example of this would be the Weeny Word Processor program in the April/May issue (word processing in five lines of code), which was updated in September to handle disk input/output as well, but still remained an extremely short, compact bit of programming. Now, I get a number of letters each month suggesting that we list out a word processing program for the business man, capable of (amongst other things) handling form letters. The only reason we haven't is that I haven't got a word processor capable of handling form letters, that isn't already actively marketed by someone else!

So, all you programmers out there! The listing in its expanded form is in our September issue: I (and an awful lot of readers) await a form letter version. If you haven't got a copy of September issue, just drop me a line at the address on the masthead and I'll get one off to you. Can you resist the challenge?!

Dear Sirs,

Commodore state, and others such as Raeto West follow them, that "Input= is limited to the maximum string size of 80 characters". However, try this program:—

One can then split any string up to maximum length into LEFT$ (189) and MID$ (190); open and close for each one, and then reunite after inputting. This has a certain limited use, for example, storing a long string of gosub headings to be separated by MID$, or indeed any such long list. It is quicker than GET=, and creates fewer unwanted strings.

Yours faithfully
R. N. Higinbotham
London SE11

Dear Mr. Higinbotham,

It's surprising that, after some four years of the Pet being with us, people can come up with new facts and figures about the machine. Or is it? Remember the old WAIT 6502,40 on Basic 2 machines? Pressing down the 'Greater Than' key as well, and all those other wonderful little idiosyncrasies that people have discovered over the years.

Your program certainly works, Mr. Higinbotham, and will indeed have its uses. I look forward to receiving some of the more original applications from you code-oriented people!

Dear Sirs,

I have had the pleasure of using my Pet 2001-8 for about four years now, but due to it having original roms, any new program that has Peeks and Pokes tends not to work.

The TIS workbooks that I have suggest Teach an Old Pet New Tricks, by Len Lindsay, for a description of these differences. Do you have this, or a similar workbook that will help solve this problem?

Yours sincerely
E. Rogerson
Blackpool

Dear Mr. Rogerson

As you are perhaps aware, Len Linsay is regarded as quite an authoratitive voice in the Commodore world, and so I can certainly endorse your TIS workbooks claim (and do you remember when those workbooks appeared? Ah, those were the days) that it is worth looking at. The only other thing I can think of is to take the various memory maps, arm yourself with many cups of coffee (or pehaps something stronger!), and burn an awful lot of midnight oil.

The memory maps have been published in a number of publications: Pet Revealed, ICPUG Compendium, Best of the UK Commodore Pet Users Club Newsletter amongst others. If you (or anyone else for that matter) have any trouble acquiring them, drop us a line and a stamped addressed envelope, and we'll see what can be done.

Dear Sirs,

You published my article on More Input and Output in the August issue of Commodore Computing, and trust that you will therefore find my next contribution of similar interest. This will be on the calculation of molecular weights from chemical formulae input in the conventional format e.g. (NH4) 2SO4, 5H2O etc. It explores a number of problems encountered in the Input statement.

Meanwhile, you asked sometime ago if anyone had a list of WAIT statements. Although these are for Basic 2 mahines, I'm sure one of your readers will come up with the alternatives!

Yours sincerely
A. H. Potten
Witham

Dear Mr. Potten,

Yes, we look forward to seeing your next contribution: may they continue to come!

Thanks also for the list of useful WAIT statements. I'm sure many readers will find these of use in your own programs, and no doubt this will trigger off an avalanche of more WAIT statements in the future. What about some for the Vic, you Vic-lovers out there? You must have been playing around with the machine long enough by now: let the rest of us see what you've found out.

Dear Sir,

A friend in New Zealand and myself correspond quite regularly by sending disks to each other. When you've got a microcomputer, who needs to write letters?!

Usually we exchange programs and utilities, and also put a little message on the disk just to give some clue as to what's going on. However,

when his last disk arrived, there was a slight disaster! In other words, 23, READ ERROR, 19, 01. I've tried Validate and Collect, but to no avail. I've tried Backing up the disk onto a new one, and all kinds of things, but nothing works. Rather than admit defeat and write back to him with pen and paper, I was wondering if you had any ideas?

Thanks in advance
Pete Thomas
London NW7

Dear Pete,

A common problem: it happened to me recently with a disk from a correspondent in Israel, but fortunately there is one way around this problem which usually works. If it doesn't, the only thing you can do is contact Harry Broomhall and ask him for a copy of his Lazarus program!

Insert your damaged disk in drive zero, and a brand new (but Headered) disk in drive one, and type in and RUN the following program:—

This copies the corresponding sector from the nice new disk in drive one over to the damaged one in drive zero, overwriting any nasties it finds along the way. As I say, if this doesn't work, you've had it. Even if it does, you may still find a bit of damage, but most of it should be alright.

Dear Sirs,

I've read in various places about double sided disks, and wish that I could use mine as such: I'm forever running out of storage space! Again, various magazines, and indeed other Pet using acquaintances of mine, have suggested turning the disks over and simply using the other side, but I fail to see how this can work?

I was wondering if you could tell me A) whether it can be done, and B) is it safe to do so. I'd hate to start backing everything up onto both sides of a disk only for the (possibly) inevitable to occur i.e. I lose the whole lot!

Whatever the news, thanks for the time and trouble anyway.

Yours sincerely
John Ayres
Southampton

Dear John,

First of all, I would not like to recommend to anyone that they use both sides of a disk, purely because I would never dare risk it myself. However, others more venerable (if that's the word!) than I have done so, and so far without disaster striking them down. Both Danny Doyle, a frequent contributor of ours, and Mick Ryan, a well known face from the Independent User Groups, have been doing this successfully for some time now.

Perhaps Mick Ryan's approach is the best one. NEVER keep master copies on the reverse side of a disk, but only backups. That way, if anything does go wrong, you still have the original safe and sound, and can easily make another copy.

So, how is it done? As far as the disk is concerned, I haven't a clue. The question was pondered over a pint or two with Danny, but the only conclusion we came to was that it shouldn't be possible! Still, this is how you do it.

Take your disk, and put another one back to back with it. Where the Write Protect notch of one encounters just solid material on the other, cut out a corresponding notch, and vice versa for the other disk. Voila! That's all there is to it, and you can now use both sides of the disk (you hope).

KEEP IN TOUCH

If you've any point of view that you'd like to air, or any question that you'd like an answer to, drop us a line. It's your chance to keep in touch, both with us, and with other users.

The Editor reserves the right, prior to publication to amend/alter any letter as he sees fit.

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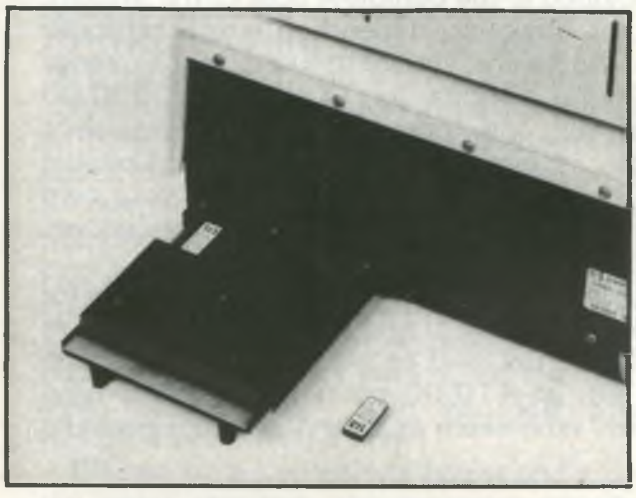

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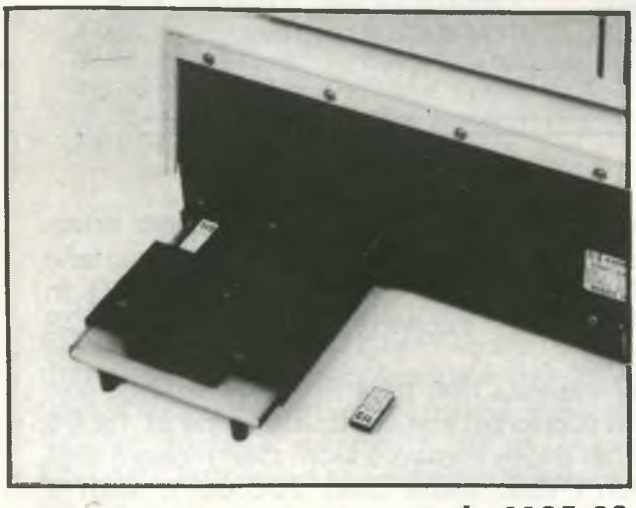

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Our old friend New Product News, along with the rest of the magazine, is taking on a new look this month. Bigger, better, we've changed the name to the Commodore Hotline. If you've any news which you think ought to be brought to our attention, write to the address on the masthead, and mark your envelope 'Commodore Hotline'.

Book Time

Addison-Wesley last month brought out their biggest and best catalogue yet, and today we received news of their plans for the new year, including one book called Problem Solving in Basic on the Pet/Vic, by a chap called Hugh Vincent. This is intended primarily for 14 to 16 year olds, but could really be used by anyone interested in learning problem-solving techniques on the aforementioned computers.

Another newcomer, Computer Application Packages, is written by one Kathleen Hennessey, a rather well-known name in this field. This isn't a book 'though, but instead is a disk containing four programs simulating main-frame activities of organisations like British Airways and the Trustee Savings Bank (I thought the TSB's use of Pets was supposed to be Top Secret? Ooops . . .). Applications courses to you and me.

Area: *Book Publishing*
Company: *Addison-Wesley Publishers Ltd.*
Address: *53 Bedford Square, London WC1B 3DZ.*
Tel.: *01-831 1636*

Information Technology

Department of the Environment getting in on the act now, quoting one Tom King ('Local Government Minister') on the subject of Information Technology. You haven't forgotten that this was information technology year, have you?

Basically, Tom's message is for far more use of I.T., specifically in enabling authorities to provide services to the public with greater efficiency and at a much lower cost. ''Our performance as a nation has suffered too often from failure to appreciate how to apply science and technology''. He ought to be subscribing to Commodore Computing!

Area: *Micro Awareness*
Company: *Department of the Environment.*
Address: *2 Marsham Street, London SW1P 3EB.*
Tel.: *01-212 3434*

From A to Z

The Alphabet Company has been with us for about eight years now, and over the last three have been developing an extensive suite of programs for client's use on Commodore Pets. No area is spared: newsagents, timestudy analysis, database programs, costing and invoicing, work analysis, and an obscure one to finish with, namely calculation of cycle times in sheet-metal cutting work (for some reason they've called this one Guillotine).

But they do more than simply sell the packages. Also included in the complete cost of the system, which will obviously depend on which particular item of software you've bought (prices range from 20.00 pounds for Guillotine to 350.00 pounds for the comprehensive newsagents package), is one days training at the Alphabet house, plus one or two day visits to your own sites from one of their staff. One or two depending on where you live.

But the story isn't over yet. Another offer is for a couple of printers, the OKI Microline 80, at 325.00 pounds, and an old favourite the Epson MX80 T3, at 410.00 pounds. An enterprising company, who seem to be trying to cover all the bases.

Area: *General software, printers & accessories*
Company: *The Alphabet Company.*
Address: *2 Whitefriars Way, Sandwich, Kent CT13 9AD.*
Tel.: *0304 617209*

Super Storage

We all know about the Mator Shark disk drive, with its 22 or 30 megabytes of storage, and basically behaving like a big (very big!) 8050. In other words, it supports all the usual DOS commands.

It now appears that their Sharkive storage unit is now available off the shelf, at a price of 1,895 pounds (all those rumours from Commodore that it wouldn't cost more than 700.00?), with a backup time of 25 minutes for one logical drive of the 22 megabyte beast.

The Sharkive uses ANSI standard data cartridges, which cost between 20.00 and 30.00 pounds each depending on which version you acquire, and this in turn depends on which disc system you've got. Not bad, considering the millions of bytes of storage you've got!

Area: *Hard Disk, and Backup*
Company: *Mator Systems Ltd.*

Address: *Willett House, 12 Grand Avenue, Hove, Sussex BN3 2FQ.*
Tel.: *0273 720451/2*

Emergency Ward 20

More applications for the Vic 20 this month, with the launch of a suite of programs going under the general name of The Home Doctor Series.

There are six cassettes in all, covering basic medicine, one each for male, female, and kids, a package called How Healthy Are You, and finally 101 Home Nursing Tips. You too can think of 101 things to do with a nurse at home!

Although not mentioned in their press release, I do think Eastmead Computer Systems ought to stress the fact that these cassettes do not replace a telephone call or visit to your doctor. Nonetheless, they do provide a wide range of advice and information (by system or health topic) on medical ailments, and the treatments thereof.

The press release rather quaintly says 'advice given . . . the urgency with which the user should seek medical help'! Can you still press the RETURN key whilst dying?!

Written by a Neurophysiologist and a doctor of ten years standing, the programs should prove useful not only in the home, but also in schools, from an educational point of view.

Area: *Medical Aid Cassettes*
Company: *Eastmead Computer Systems Ltd.*
Address: *Eastmead House, Lyon Way, Camberley, Surrey GU16 5E2.*
Tel.: *0276 682041/2*

Takin' Care of Business

This month's accountancy package is brought to you courtesy of Polymath Systems. One thing that the author of the package has stressed is user friendliness throughout: thus there are many 'escape routes', an awful lot of checking of keyboard entries so as to avoid disasters, and so on.

But all this checking must not fool you into thinking that the package is a slow one, or indeed an inefficient one. It would be a waste of time to list everything that the package does, but a single item should serve to show how this particular 'integrated accounts package' might score over some of its rivals: the ability to print out aged debtors and creditors, profit and loss and sales ledger statements at any time, and not just with the usual month end routines.

On the factual side, using the Commodore 8250 disk drive you can store up to 3,600 personal accounts, plus between 5,000 and 6,000 stock items. Quite a lot.

Area: *Accountancy*
Company: *Polymath Systems.*
Address: *Regency House, 4 Clarence Road, Windsor, Berks.*
Tel.: *07535 69741/61640*

A brief mention for IBIS (Integrated Business Information System), now available in an 8032 or 8096, since SM Software have now put the SM LOS-96 Operating System on-board the machine itself.

Area: *Data Base System*
Company: *SM Software (UK) Ltd.*
Address: *Raglan House, 56 Long Street, Dursley, Gloucester.*
Tel.: *0453 46065*

Takin' Care of YOU!

Although we receive a lot of requests from people who want programs written (or re-written) for them, rarely do we actually see anyone advertising such a service. Well, someone has finally had the courage to do so, namely Nimrod Software, who provide a design and programming service for the Commodore range of computers.

So if you've got any sort of queries in this area, the program that you've been working on for the last six months still doesn't work, or you want an accountancy package written from scratch, these are the people to contact.

Part of the same company, going under the different name of PFL (Programs for Learning), also produce a range of educational software. It's good to see a single company going out to support different areas of the market: let's hope they succeed.

Area: *Programming Service, Educational Software*
Company: *Nimrod Software/PFL.*
Address: *4 Stanley Road, East Sheen, London SW14 7DZ.*
Tel.: *01-878 6498*

Fission Chips

More new chips for Pet and Vic, bringing with them the promise of an interesting court case. One day someone will settle this copyright pro-

blem once and for all, but until then we can't really mention any names.

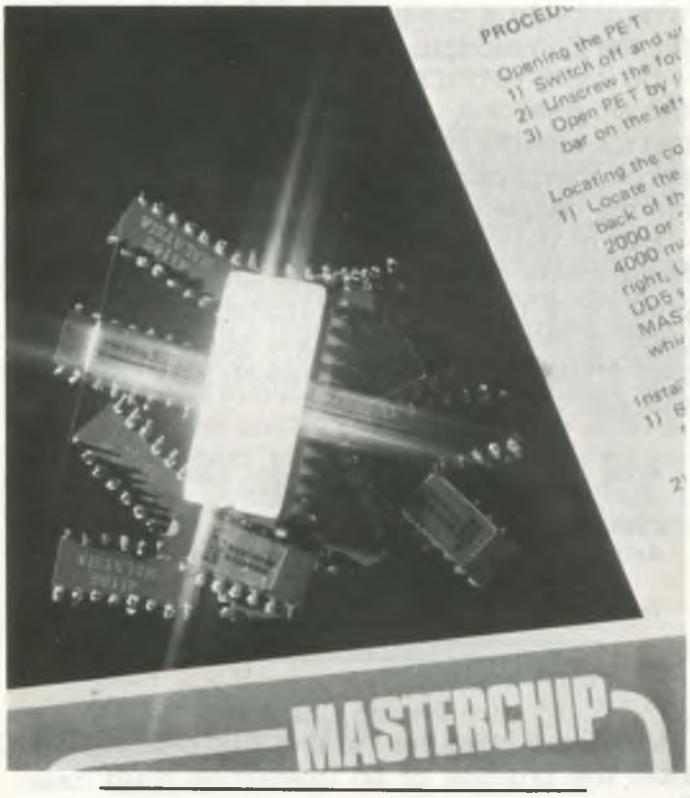
But away from the glare of adverse publicity, Hodkin Software have come up with something called Masterchip, available for either the Pet (3000/4000 series) or the Vic. As usual, several million commands are added to Basic, but the major purpose of the chips is to aid in the use of high resolution graphics, with various new routines now being incorporated into Basic to assist in this.

At 30.00 pounds for the Pet version and 22.50 pounds for the Vic one, they represent fair value for money. I suppose it all boils down to how easy a programming life you want. Certainly, once used, you'll miss them when they're not there.

As well as this, they've produced a word processor on a chip (this is turning into a word processing issue!), which is also reasonably priced at just 30.00 pounds. Needless to say it doesn't offer all the services of Wordform et al, but it does just about all that's necessary.

Finally, Hodkin have a whole host of educational and games programs on the Pet, so for all kinds of bits and pieces it would be worth getting in touch with them.

Area: *Utility Chips, Education, Games*
Company: *Hodkin Software.*
Address: *Greenfields, Hammerwood, East Grinstead, Sussex.*
Tel.: *034 286 603*



Vic Software Given the Boots

Well-known high street entrepreneurs Boots, and our old acquaintances Audiogenic, have just completed a deal to start selling Audiogenic Vic software through various selected stores: mainly the large ones, surprisingly enough! To quote Audiogenic Managing Director Martin Maynard "We are delighted that such a famous chain as Boots have decided to carry our products. The home computer market is growing at a phenomenal rate, and outlets such as Boots are ideally suited to serve the market in a unique and valuable way". What next, I wonder.

Area: *Vic Software*
Company: *Audiogenic.*
Address: *P.O. Box 88, Reading, Berks.*
Tel.: *0734 595647*

More Vic News

Another old acquaintance, Stack Computer Services, have put together a whole collection of utilities, including many they've developed themselves in the course of other development work, into a cartridge called Supercharger Plus.

This incorporates not only Vickit1 and Vickit3, but also a host of programming short cuts, graphics techniques, and an extra 3K of RAM for all those wonderful high resolution programs you've always promised yourself you'd get round to writing one day.

At 49.00 pounds it's a fairly reasonable price, but it strikes me as being similar to the idea behind record companies releasing 'Greatest Hits' albums: if you happen to be a fan of the group, you end up paying full whack for 2 or 3 tracks. Still, if Stack are new to you, it's quite good.

Also from Stack we have 40 column display on a T.V. or 80 columns on a monitor. Now then, is this another Beebox (i.e. you can see 80 columns but you can't do anything with them), or is it at last a true 80 column display? We'll let you know, but until then you could always save yourself 99.99 pounds and ring them up and find out!

Area: *Vic add-ons and accessories.*
Company: *Stack Computer Services Ltd.*
Address: *290-298 Derby Road, Bootle, Liverpool L20 8LN.*
Tel.: *051-933 5511*

Commodore have sent me a press release on the 64. When will they send everyone a Commodore 64?

Add-ons and Accessories

Pedro Computer Services (now there's a name!) must take the prize for one of the most useless add-ons to appear this year. A little gem called CWDA, whatever that means, lets you see when there's a disk error, or hear when there's one, and have a total external control over write protect switch on both drives. Wow! A snip at 25.00 pounds.

Seriously, there's little or no point in producing software/hardware of this nature: it does nothing to enhance the machine, and only adds to the mystique surrounding micros. Besides, a press release that includes the words visable (I always though it was visible?) and disk dirve, does little to inspire confidence in the well documented installation guide.

Area: *Disk Accessories*
Company: *Pedro Computer Services.*
Address: *4 Cowcross Street, London EC1.*
Tel.: *01-250 1481*

Huberta Kingsbury (remember her?) of Automation Facilities, announced a couple of new additions to the health and safety act for micros the other day. ASCAT, an anti-static carpet treatment, for neutralising and preventing build up of dust and static, and SAFECLENS Liquid VDU Cleaner, for performing the obvious task of cleaning the screen. All good and useful stuff.

Area: *Maintenance Accessories*
Company: *Automation Facilities Ltd.*
Address: *Blakes Road, Wargrave, Berks.*
Tel.: *073 522 3012*

I was told off for describing Simple Software's last press release as very Gang Show in style. Their latest one, however, does little to change my mind. I know the products are good, I know they do what they're supposed to do, but honestly! Let me quote you just one line "It is hard to choose which are the most useful and exciting commands of this amazing set".

Anyway, their latest release concerns Turtle, the well-known graphics package, which they've now implemented on the Pet. As usual, lots of commands are added to Basic, but at least Turtle is a universal package, rather than the ones that other companies bring out, which tend to stick to just their own conventions.

Available in disk, tape, or ROM form, 40.00 pounds is rather a reasonable price for this.

Area: *Misc. Pet & Vic software, Pet graphics*
Company: *Simple Software Ltd.*
Address: *15 Havelock Road, Brighton, Sussex.*
Tel.: *0273 504879*

Local Area Networks

Thought you'd heard the last of this, didn't you? Well, not according to Paul Handover, of Dataview, who says "extensive market research . . . indicated that as much as 60% of corporate information flows inside a single building. As a result a new market for local area networks is growing rapidly". Never one to miss an opportunity, Handover has signed an agreement to market a product called Hydra, developed by Analog Electronic, which is (believe it or not) a local area network system for CBM equipment. Sketchy details at the moment, so you'd be advised to get in touch first.

Area: *Local Area Networking*
Company: *Dataview.*
Address: *Portreeves House, East Bay, Colchester, Essex.*
Tel.: *0206 869414/865835*

A Mixed Bag

A whole host of different programs from the Computer Room including (for the Pet) engineers production control, schools administration, and a database for accountants. For the Vic we have a newsagents package (again!), a car quotation system, and a collection of various printing programs.

Nothing like getting into as many markets as possible, is there? None of these are particularly outstanding, but at least they work, which is what you pay the money for.

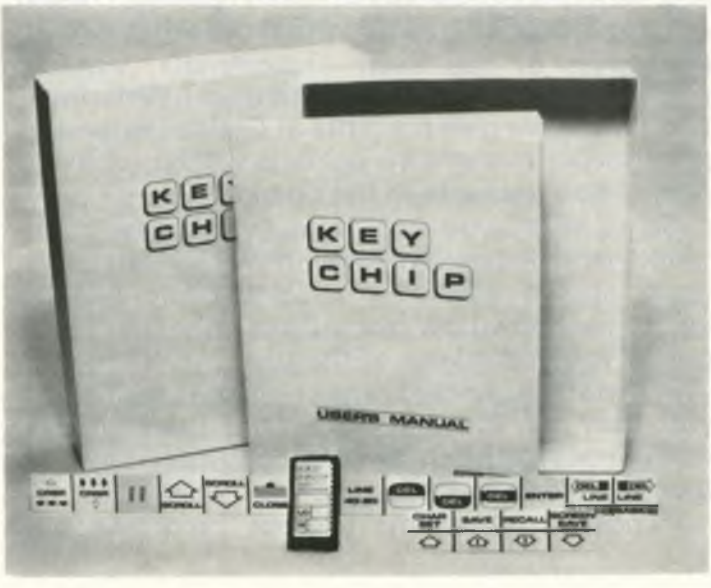
Area: *Misc. Pet and Vic software*
Company: *The Computer Room.*
Address: *87 High Street, Tonbridge, Kent TN9 1RX.*
Tel.: *0732 355962*

No Fault of Mine

Commodore have recently taken on board an interesting new product for fault finding in the 3032/4032/8032 computers, and the 8050 disk drive. Requiring no skill from the engineer operating the device (no comment!), the Solartron locator comes complete with various manuals and ROMs for each different machine, and simply connects up to the Pet before going through a variety of tests to see if there's anything wrong with it.

If there is, it'll let you know, and thus service time (and costs, you end-users) is cut dramatically. All well and good, but what if something goes wrong with the Locator?

Area: *Machine Maintenance*
Company: *Solartron Electronic Group Ltd.*
Address: *Victoria Roa, Farnborough, Hampshire GU14 7PW.*
Tel.: *0252 44433*



Data Input and Output

Two new goodies from Quality Computer Controls. First of all, at an undisclosed price (I could tell you the dealer price, but I don't suppose they'd like that!) we have Data Tab, basically a remote data entry pad.

With up to sixteen of these beasts connectable up to the Pet at any one time, each one allows rapid entry of data, simply by ticking a box with a pen, just like entering data normally on pen and paper. However, since all this is linked up to our friendly micro, everything is stored and saved without the possibility of future errors creeping in on later data input for analysis.

Just to make sure you know what you've done, a little bleeper sounds every time you make an entry.

So, you're free to walk around the shop, factory floor or whatever, gathering information as you go, without ever having to even see the computer that will do all the processing work.

The other one is a little number called Printerlink, which sits between the Pet and the printer, and has a 32K byte storage area. Thus, you output a word processor file, a program listing or whatever, the printerlink stores it and then prints it (with an optional repeat facility), leaving the Pet, and you, to get on with something else in the meantime. Should save you an awful lot of time.

Area: *Data Input and Output*
Company: *Quality Computer Systems Ltd.*
Address: *88 Fleet Road, Fleet, Hants. GU13 8PA.*
Tel.: *02514 23833*

Advice for Schools and Colleges

As Commodore appear to be increasing their support towards education (something we take a look at later on), so we'll increase the amount of space in the magazine devoted to the role of CBM machines in the educational environment.

In common with the rest of the magazine, we want to make this as much your column as it is ours. If you work in the world of education and have access to/use/play with CBM micros, let's hear from you. And not only the teachers, although their views are obviously as welcome as anyones.

I also look forward to hearing from the people who actually sit down and use the machines: the pupils. They, after all, are the ones who benefit (or otherwise!) from the introduction of microcomputers into the classroom, and their opinions must therefore be as valid and as valuable to us as those of the most experienced teacher.

So, put pen to paper or finger to keyboard, and write to the editor at the address on the masthead of the magazine. Mark your letters Educational Report, and I look forward to hearing from you.

Christmas is a' comin'!

We've mentioned before in these pages the vast number of suppliers of low cost eductional software and hardware for both Pet and Vic. That is why these two still remain ahead of the others, despite DoI schemes and the like. Other computers simply do not have the backup in terms of support, or readily available off the shelf packages, to enable schools to take the plunge and go out and buy them.

Also, when Commodore started their Educational Workshop scheme, under the expert guidance of Nick Green, I don't think even they realised just how much good that would bring about, not only for the schools, but of course for Commodore as well in terms of sales and general good will.

There are heaven only knows how many schools in that scheme now, each one prepared to offer guidance and help to other establishments in their area, and as they possess Pets and/or Vics its only reasonable to assume that they'll be passing on Pet and Vic expertise to those other schools.

But expertise and guidance aren't the only things they'll pass on. Commodore have placed an awful lot of programs into the public domain, not all of them good it must be said, but certainly all of them are useable, and if not useable direct they can easily and quickly be modified into something more than just another throw-away program.

The third major thing that Commodore have done to aid education is their rather good discount schemes for proven educational bodies. Starting off a long time ago with the Languages disk, and now carrying on by way of rather large price cuttings on some of their computers, which has in turn encouraged a number of other companies to follow suit: well done Precision Software, Superscript for just 50.00 pounds.

Benefit to Schools

Okay, they're just getting rid of old stock before the new machines come along and no-one will want to buy 4032s or whatever any more. That is not the point. What is is that it's the schools that benefit, by getting good, inexpensive computers that aren't going to be outdated overnight, and moreover ones that have (to complete the circle) that vast array of programs already available, most of them free.

In other words, if you're in a school considering buying a micro, bear all of the above in mind. I realise I may be preaching to the converted here, but the odds are that Commodore run an awful lot of educational schemes that you aren't even aware of. Just in case, why not drop Jean Frost a line at Commodore (675 Ajax Avenue, Trading Estate, Slough, Berks.) and find out what's going on.

And why did I mention Christmas? Well, traditionally people give presents at Christmas, and so presumably one or two schools will be receiving one or two presents in the coming weeks.

So to all of you out there are already in the workshop scheme: we know how many free programs you've received from Commodore over the years, we know how many disks choc full of programs you've had out of them!

Some schools nearby may not be as well off as you, they may only have tapes not disk drives, or vice versa (you can always copy programs for them), so let's be generous.

I know it takes time to copy programs, but

you'll be doing other schools in your area a lot of good, and that in turn will be reflected back on you in terms of ideas given, hints received, and so on. Many hands make light work, remember?

What I'm trying to say is this: it's Christmas, season of goodwill and all that, so make a few other teachers happy. Give 'em some free programs. It's not going to cost you anything (they can always supply their own tapes/disks), it'll benefit them and their kids, and you know you'll feel better for it. Why not?

Education Adviser

As well as the above, Commodore have recently taken another step forward in education by appointing a special Education Adviser, one Graham Sullivan, head teacher at Lowbrook County Primary School in Maidenhead, Berkshire.

One wonders where this leaves Nick Green, so long the master of Commodore's educational forays. No doubt this appointment will leave him free to concentrate on other special projects: he is, after all, their Special Projects Manager.

Graham's appointment is for just one year, and after that he'll return to his school. As he says: "I look forward to the forthcoming year, but I know I'll miss the school life". Why was Graham given this role or for that matter why was anyone given this role?

To answer the latter question first, Commodore has long had a fairly strong footing in schools and colleges, without really trying. They have, of course, promoted the schemes mentioned earlier, but other manufacturers do similar things without having anything like the same sort of success.

Recently however the recession has begun to bite (byte?) and sales are not what they used to be. Why should schools buy a Pet or Vic when they can buy a different microcomputer at a massive Government aided discount? Consequently, Commodore have got to fight back against this, and having Graham with them for a year should help.

I must point out that Graham is not actually working directly for Commodore, and would like to be seen as an independent advisor. Most of his time will be spent on the road, finding out what teachers up and down the country really want, and then trying to persuade Commodore that this is what they ought to be doing. He must have a reasonable chance, otherwise the job would not have existed in the first place.

Why should he succeed when Nick Green, for all his efforts, hasn't really changed things that much?

A Bit of Background

To try and find an answer to this, it's worth going back about four years to when Lowbrook School acquired a Pet: one of the first primary schools in the country to do so, certainly for active use in the school curriculum. This original micro has now been joined by three other Pets and one Vic.

But really we're not interested in the hardware, but how the machines are used. Basically the pupils are responsible for their own learning, and left to work very much on their own, independently of outside help. They know what the computers are capable of, and as Graham says "It's up to us to fire their imaginations".

Most of the teachers there seem eminently capable of doing this, as the majority of staff have attended some kind of computer literacy course.

So it's not so much Graham as a person, although that obviously comes into it, but instead his background, the kind of work he and his staff have already done, and his committment to freeing the kids from the traditional learning methods and letting computers come in to relieve them.

Fresh Ideas

But, all of this is to no avail if, at the end of the year, absolutely nothing has happened.

He's already got some stirling ideas: workshops and seminars, production of good software, information sheets, contact with LEA advisors, investigating all manner of things (Turtle, Telesoftware for instance), and the excellent idea of producing the requirements of a machine to be designed specifically for education.

Well, Commodore haven't said no yet, but on the other hand haven't said yes either. As a one-time employee of Commodore I know how long it takes to get the company moving into areas it doesn't really want to go into, but feels it ought to have a look at, for appearance sake.

It will all boil down to the fact that educational establishments are not dealers, and can't have hundreds of machines rammed down their throats in some kind of big promotional drive: they will pick and choose what, and when, they buy, and will not be dictated to.

I hate to say it, but I can't really see Graham's appointment making that much difference. I'd love to be proven wrong, and perhaps with enough help from Commodore, and from you, the teachers and users out there, something will happen.

Until it does, we'll just have to wait and see.

VIC-20 USERS

The new Seikosha GP-100VC graphics printer for around £235. EX. VAT

Offering big printer performance at a fraction of the cost, the latest addition to the famous range of Seikosha micro-printers is the 100VC. The precise match for the VIC 20.

Featuring all the VIC 20 characters, symbols and graphics as standard, the Seikosha 100VC includes full graphics capability. It enables graphic, character and double width character modes to be intermixed on a single line as well as repeating graphics data, as you want, with a single command.

Many other advanced features, plus Seikosha's proven reliability and the nationwide support of DRG's distributor network make the 100VC the natural choice for the VC10 user.

DIMENSIONS:

Depth – 9¼" (234mm)

Width – 17¼" (420mm)

Height – 5¼" (136mm)

OPTIONS:

Interfacing for most other systems available on the GP100A model.

FEATURES INCLUDE:

- 80 col. 30 cps.
- Dot Matrix unihammer action.
- 154 characters (inc graphics)
- VIC-20 8-BIT CODE
- Full graphics.
- Double width printing.
- Automatic printing
- Up to 10" paper width.
- Original + 2 copies.
- Tractor feed.
- Self testing.

DRG BUSINESS MACHINES

Telephone the number below and we'll tell you where your nearest distributor is located. See the remarkable Seikosha GP100VC in action

(Peripherals & Supplies Division) 13/14 Lynx Crescent, Winterstoke Road, Weston-super-Mare, BS24 9DN. Tel: (0934) 416392.

THE FINEST WORLDWIDE SUPPORTED NATIONWIDE.

DRG (UK) Ltd, Reg No. 22419 England.

Dealer Support

Last month you may recall that we took a look at the quality of maintenance work carried out on your behalf by various companies up and down the country. We'll be publishing the results of that in next month's issue, hopefully, but if not it will be soon after. It should make for interesting reading, and perhaps shake one or two companies up a bit!

However, as we all know the story starts well before that. Perhaps you were a total newcomer to the world of computers when you first went into that dealers showroom and asked for help and advice. Perhaps you were satisfied with your first purchase, and just went back to that dealer as a matter of course for your next buy.

Or perhaps, more interestingly, after one bite at the cherry you never went there again and did all future business elsewhere?

Whatever way it was, we'd like to hear from you in this month's survey. We're taking a look at the Commodore dealer network, an extensive group of companies up and down the land, all purporting to do the same thing: sell you computers, look after them and you, and all in all give you good value for money.

By completing the form below you'd be doing all of us a favour. Just fill it out (don't worry: everything will be treated in strictest confidence!) and return it to the editor, at the address on the masthead. After all, Commodore have fired dealers before now: perhaps one or two more ought to be going?

By the way, if you're a dealer, don't get upset by all this. if you're a good one, then you've nothing to worry about, have you?

Commodore Dealer Network

Number of systems .....

Details of system(s) (e.g. 8032, 4040) .....

.....

When was your original system purchased .....

And who was it purchased from? .....

.....

.....

.....

.....

Overall, are you happy with the service you have received (Y or N) .....

On a scale of 0 (low) to 9 (high), how would you rate: hardware .....

software .....

any repairs, if necessary .....

general level of help and advice .....

Would you use them again (Y or N) .....

If not, have you used another dealer (Y or N) .....

If you have used another, who was it? .....

.....

.....

.....

.....

And how would you rate them (0 to 9) .....

Finally, your name and address please .....

.....

.....

.....

.....

MASTER ... a new concept

MASTER is a totally new concept - a complete package for program development. MASTER adds up to 85 commands to CBM Basic IV, for rapid and efficient development of reliable, professional programs, whatever the application. Programs can be up and running in double-quick time, and will out-perform standard Basic IV programs every time. One MASTER command can replace whole paragraphs of Basic code. Projects that would have been non-starters, can be tackled with ease. Add MASTER to your Pet - and let your Pet amaze you!

ISAM FILE MANAGEMENT

MASTER has 17 commands for keyed-access to disk files. Data can be retrieved/added/deleted/updated from file by ASCII key (up to 30 bytes long). Files can be read through forwards or backwards by key, starting anywhere. Or for extra fast access, data can be read in creation order, even faster than reading a standard sequential file! For on-line data entry, file indexes can be updated optionally in batch mode. Up to 10 MASTER files can be opened at once, with no space restrictions except disk capacity. MASTER files can be mixed with standard DOS files.

SCREEN MANAGEMENT

MASTER has 20 commands to give complete control of the screen, and keyboard input. Input/output can be done through screen zones, which may be formatted, e.g. for numerics/alpha/dates. Screen layouts can be saved and loaded from disk, or swopped around within memory. Windows can be declared, with full scrolling capabilities, and there are commands for drawing lines and clearing and reversing areas of the screen.

REPORT MANAGEMENT

MASTER has 10 commands for complete and easy control of printer output, through report formats. Each report format can contain up to 128 output zones, which can be pre-formatted as required. Report formats can be saved and loaded from disk.

BASIC ENHANCEMENTS

MASTER has 18 commands of Basic enhancement including: automatic date control - 20 place decimal precision arithmetic - data packing/unpacking to save space on disk - direct block access to disk - variable transfer to/from buffers - searching within strings - string conversion upper to lower, lower to upper case - GOTO and GOSUB with variables as line numbers - program scroll-through in edit mode - and a NOLIST feature to protect programs from unauthorised listing.

96K MEMORY MANAGEMENT + 96K BASIC ENHANCEMENTS

On 96K machines, MASTER manages the expansion memory to give 46K for program space, and 26K for variables, and adds 17 new Basic commands (see PM96 for details).

HARDWARE SUPPORTED

MASTER supports the CBM 8032, CBM 8096, CBM 8032 with CP/MAKER, and CBM 4040, 8050 and 8250 floppy disks, or CBM 9060 and 9090 hard disks. MASTER is supplied with a comprehensive User Reference Manual, Quick Reference Guide, Demonstation Diskette, and with a key to attach to either cassette port. Supplementary RUN-TIME keys are available for multiple users, and software houses.

PM-96

PM96, for the CBM 8096, adds 17 commands to Basic IV, including the Toolkit commands AUTO, DELETE, RENUmber (all or part of program), DUMP, ERROR, FIND, TRACE (shows whole program line at top of screen) and OFF. All except AUTO and ERROR can be included in programs. Also CALL to call machine-code routines, passing up to 15 parameters, FETCH to load machine-code from disk, without program re-start, PLOT and RESET for medium resolution screen plotting (scale 50 by 150 points), PRINT USING for formatting output to screen or printer, IF... THEN... ELSE... for compact conditional programming, STOP KEY enable/disable, and HARDCOPY, to dump the screen to printer, with definable margin.

96K MEMORY MANAGEMENT: PM96 gives total control from Basic over the 64K expansion memory, with 26K reserved for variables, which are maintained even while editing or loading programs. The 53K program area can hold up to 15 programs simultaneously, and you can switch from one to another automatically, and use GOTO or GOSUB and return to your main program. The PM96 package includes a User Reference Manual, Quick Reference Guide, Disk with demo programs, and Support Rom for the front (UD11) Expansion Rom slot.

VIC-SCREEN

VIC-SCREEN, for the VIC-20, has all MASTER'S screen management features plus colour control, Dos Support, and string searching, creation and case conversion. 26 new commands in all, on an auto-booting cartridge, with User Reference Manual and Quick Reference Guide.

Superscript

The ultimate CBM wordprocessor! Wordpro-compatible (except for price!) plus up to 20,000 characters of text, with up to 240 characters column width, and no Roms or dongles to install! Suits most Pets and disks.

PRICE LIST

MASTER Development System £300.00
MASTER Additional run-time keys £45.00
PM96 Memory Management/Basic Enhancement £99.50
VIC SCREEN Screen management/Dos Support etc.. £49.50
SUPERSCRIPT The Ultimate CBM Worprocessor ... £249.00
KRAM Keyed Disk Access (state which disk) £86.95
COMMAND-O (for Basic IV, state which Pet) £59.95
DISK-O-PRO (Adds Basic IV etc to Basic II) ... £59.95
SPACEMAKER 4-Rom adaptor (not for 8096) £29.95
VISICALC 32K/96K RRP £180.00, less £35.00 ... £145.00
WORDPRO II,III,IV,V Plus ..... all at RRP less 20%

ORDERING INFORMATION: Add 15% VAT to quoted prices. Orders can be made by post, telephone or Prestel, using cheque/PO, ACCESS or BARCLAYCARD. For same-day service, telephone 01-546-7256. For over-the-counter sales, see your nearest Commodore Dealer. (Ref AD7)

Calco Software

Lakeside House Kingston Hill
Surrey KT2 7QT (01) 546-7256

Micronet 800: a look into the Future

In common with several other sections of the magazine, we're expanding here as well, to reflect the growing size of our business readership. Commodore Club News of old was long regarded as a hobbyist type of magazine, and as such did little to cater for the needs of the business end of the market.

However, we, like everyone else, must move with the times, and there's no doubt that as Commdodore become more and more an outfit selling machines to businessmen so we must cater for that particular type of user as well.

Obviously we will not be cutting out our usual run of hobbyist, enthusiast, games and general utilities sections, but instead of making those smaller we will simply make the rest of the magazine larger! You can see already that this issue is the largest issue we've ever done.

A couple of months ago we started this regular Microcomputers in Business section, and next issue sees the start of another section, which will end up essentially as a six month training course for users of micros in business.

Similarly a number of our reviews reflect this growing business readership, and this we'll try and sustain throughout the coming months.

All this cannot be done without you, the reader. If you're in a company using microcomputers (not necessarily Pets, although I think you can agree that we'd prefer that), if you're thinking of buying a Pet for use in business, or for whatever reason there is a connection between you, Pets and business, drop us a line at the address on the masthead.

Mark your envelope Business Applications, and just tell us what you've done, what you're doing, or even what you're thinking of doing. We, and the rest of the readers, would be interested to know!

Micronet 800

This months column turns its attention towards Micronet 800, a system for use in the home, in education, but most importantly of all, in business.

Users of computers in business, or anywhere else for that matter, are aware of the need to keep themselves informed of what is going on in the world outside the office. You have to keep in touch, especially in the current recession, where a hastily made, uninformed decision, could quite easily lead you into bankruptcy. As Commodore are quick to point out to us, last year was a record one for British businesses: more than 8,000 of them went bust!

Consequently, whenever anything new comes along you will need to know all about it as soon as possible.

One such way has been with us for quite a while, but only recently has British Telecomm given its full seal of approval to one particular aspect of this system. Incidentally, why do we always have to wait for British Telecomm? Monopoly industries are all very well, but they are supposed to serve us after all!

The method under discussion revolves around computer communications. Computers have been talking to each other for a long time now, and with the advent of low-cost micros this communication has become ever easier and cheaper. But as we all know, there are communications and there are communications.

Here we will concern ourselves not with our Pet talking to another Pet, but rather talking to a vast information network (although Pet to Pet conversations will come into it later). It is this network that we will now take a look at.

Useful Uses for Television

Most of you will be familiar with the free services pushed out by the BBC and ITN, namely Ceefax and Oracle. Available on specially fitted televisions, these are menu-driven information services, covering just about anything under the sun. From the weather to the winner of the 2.30 at Newmarket, from stock prices to the latest exchange rates, most of the information you need is in there.

However, access time is slow, and the system, when examined thoroughly, is not without its drawbacks. So, we have Prestel.

Prestel, unlike the others, is not free. You need a special adaptor, and you have to pay for the 'phone calls needed to look up the information you require. Is it worth it?

For the businessman who seriously wants to keep in touch, yes but on the other hand will you (or your secretary!) be willing to keep one telephone line and one television devoted purely to Prestel?

One final clincher should make you decide that it is worth while, and that is the forthcoming introduction of a service known as Micronet 800. Quite why the 800 bit has been added I'm not

sure, but I assume it must serve some useful purpose.

Information Network

Micronet is a service within Prestel, covering many new and varied areas of information, but we'll get to those anon. To link up to it you need your friendly micro, a 'low cost' Micronet adaptor and a telephone, and after that it's only your telephone bill that you've got to worry about.

Micronet as a whole covers an astonishing array of information. A bulletin board system, an educational exchange library, an electronic mail service, and you've also got the whole of Prestel there as well: something like 200,000 pages of information on travel, finance, holidays, entertainment, features, shopping and heaven alone knows what else.

But why should Micronet appeal in particular to the businessman?

Business Appeal

Its appeal lies in the wide range of services available to the businessman, which would be of specific interest to him.

Previously, buying a software package meant a trip to your local dealer, and a few hours sitting down and trying everything out before deciding to purchase. Micronet would appear to make life a lot easier, as a number of commercial business packages are up on the system, and are down loadable direct onto your micro. However, these are not free! Your flexible friend comes into effect here, and by keying in your credit card number (which would be suitably checked and verified) the software becomes yours for the downloading.

Not all the software will cost you money though: some of it will cost no more than the price of the telephone call, as an awful lot of public domain software has been set up in Micronet, particularly in the educational and games playing fields. Whilst this is not of direct interest to most businesses, it's always a welcome relief to zap down a few aliens from time to time.

But how do you know the software you are purchasing is going to be of any great use to you? There's no point in spending a lot of your (or your company's) money for a package that will be less than useless once the novelty of downloading has worn off.

Within Micronet is the facility to demonstrate software packages: financial planning, word processing and the like. But, just as with the salesman in the store, take great heed of what is going on 'before your very eyes'. A software demonstration can be just as good and as slick as the authors and distributors of the program want it to be be, and more often than not the reality doesn't work out to be quite so good.

Work out what the program is doing, and then try and see whether it will come up to the same performance given your data and your requirements. A database that in demonstration will perfectly happily sort into alphabetical order some 30 or 40 items, might come a bit stuck when sorting 500 or 5,000. The risk, as ever, is yours.

News and Reviews

Something which might possibly lessen the risk is the news and reviews section of Micronet.

What we're really talking about here is a magazine on television. Just as in Practical Computing, Personal Computer World et al. you'd find reviews of various products, so on Micronet you can get a similar service. Where Micronet scores over its paper rivals is the ability to direct you about the further information.

Let me explain, With the traditional magazines, a review fills a certain number of pages, and that is it. Comprehensive mayhap, but once you've reched the end of the review that is it: nowhere else to go.

But on Micronet the story does not stop there. Each review is comprehensively cross-referenced to other sections of Micronet itself: to product demonstrations perhaps, to advertisements talking about the product (as ever, you're cautioned to tread carefully with advertisements!), comparisons with other products in the same field, and so on.

In short, a much more comprehensive, total review than any magazine can hope to give you.

With instant updating of its news pages, rather than having to wait for next months issue, you can also get a fairly rapid grasp of any news item as and when it appears on the market. This is obviously vital in the business world, where anything and everything has to be taken into consideration before a potentially vital decision is made.

Thus, should some new machine, new piece of software or whatever be launched with the traditional blaze of glory, you can find out about it right away, and with the cross-referencing section find out more about it than most other people can.

Press conferences, seminars, lectures, exhibitions, signposts to your local user groups: they'll all be up there, so you might as well find out about them. The more information you have at your fingertips, the better decisions you'll be able to make.

Buyers Guide

To supplement all this there is also a buyers guide, giving a complete breakdown on everything you ever wanted to know about XYZ database but were afraid to ask, as well as other products of course.

If by now you're thinking that this is a straightforward advertisement in favour of Micronet, well think again. It is certainly true that I like the product and the concept behind it, and since I believe that it could be a great deal of use to the business user I feel it only fair to give it a reasonable mention.

However, like any other microcomputer based product on the market it is not without its limitations. High amongst these is the fact that it is almost 100% a one-sided conversation.

Some limited circumstances do allow you to 'talk' back to Micronet, but they are not of any great use to the businessman. Some downloadable software for instance will direct you along to other similar software, but so far this appears to be only devoted to games.

There is an electronic mail service, which allows you to exchange messages with other Micronet users, and a type of Bulletin Board affair, club news, that kind of thing, but this does cost extra (to say nothing of the additional telephone bill!).

Conclusion

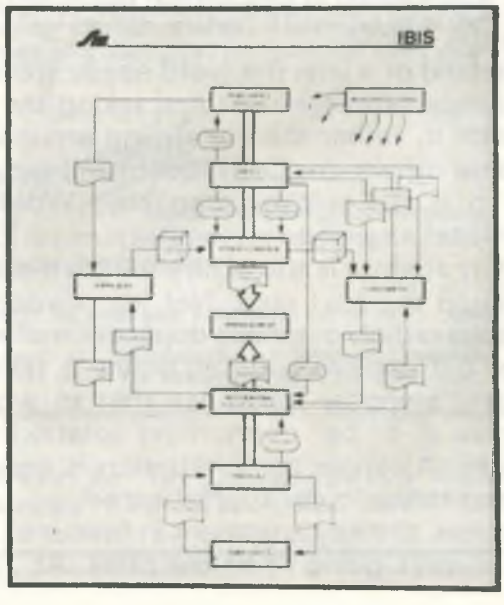
When it actually goes on the air in January of next year, Micronet will be a significant step forward in terms of the usefulness of your microcomputer. And don't think "Oh, it'll never get off the ground". It will, and the wheels of change are already rolling.

Simply by reading the above I think you'll get a fair idea of just how much a system like this is going to be of benefit to you. Instant information, in-depth reviews, buyers guides and the like, all will be of use.

There's also the possibility of a number of training courses coming as well, so these too would be worth keeping an eye out for. You'll feel a lot more confident about using your system when you can do a little bit more than simply press SHIFT and RUN/STOP!

We'll be carrying more news of Micronet as we get it, so keep your eyes on these pages: who knows, one day you might be reading this on Micronet.

Next month we press onwards in our explorations of the business world, perhaps with some help from all you readers out there? See you next issue!



A Comparative Look at Word Processors

Word processing packages have received their fair share of publicity lately, what with take overs, price increases, companies going out of business and so on, to say nothing of new packages coming out for new machines (Wordcraft 20 for the Vic, Easy Script for the Commodore 64, for example).

The once traditional dominance of the 'Big Two', Wordpro and Wordcraft, has not been immune to all this, and three other programs are now poised for a bid to take over, if not the world, at least the Commodore word processing market.

This month we take an overview of all three, starting off with the latest addition to the Landsoft word processing range.

Wordform 2.2

If promotional literature ever sold a package, one is tempted to say that Landsoft (tel. 01-878 7044) have a head start over everyone else. Their latest sales leaflet is produced by Wordform 2.2 Inked up the Hewlett Packard 7470A digital plotter (reviewed in our August issue), and is a remarkable piece of eye-catching design. You can't really call it word processing any longer, it's more a kind of word art form! Still, Wordoform 2.2 is sold as a word processor, not the computing industry's answer to Salvador Dali, so it must be judged on those merits.

In operation it is most likely to appeal to the secretary who's never seen such a program before, in that it behaves rather like a typewriter. The screen is boxed into the width of whatever paper you decide (say 80 columns), and then this screen box moves, rather than the text, as you type in the words.

At the end of a line, if a word needs splitting up it just jumps onto the next line taking the whole word with it, rather than wrapping around in the way some others do. Consequently one tends to adjust to it far quicker than say, Wordpro or Wordcraft.

One key feature is the ability to move blocks of text around the text area. Not just swopping of paragraphs either, or simple duplication of a range of lines, but instead you can define a text 'window', and swop or transpose that to wherever you desire it to be, overwriting existing text if necessary. A simple demonstration is enough to show that this is quite sophisticated.

Of course, the key argument in favour of Wordform is always going to be the price. At 200.00 pounds it is the cheapest of the three under review, and is certainly the cheapest of any serious package currently available.

Despite the low price, it will perform all the functions that one has now come to expect from a word processing program on a Commodore machine. Extra text areas, background printing, numerical functions within the main program, right justification and so on.

Thus, when comparing packages of this type it is not so much what the program can do (or even what it can NOT do, as they all tend to fall into the same range of capabilities), but how easy it is to get to grips with these functions, and also how easy it is to go wrong. How many of you have accidentally loaded a directory into Wordpro and lost over a hundred lines of text, for instance.

Wordform is not the easiest package to drive, with some of its functions covering a number of keystrokes. You can argue that this is as good a way as any of not taking any chances, but rather like Silicon Office and its much vaunted 2-letter command entry, which you then have to confirm every time, it does become irksome after a while.

Other quirks? Rather like using a Spectrum keyboard you have to be in the right mode for the right key to do the right thing, on occassion, and so you can quite merrily be typing away blissfully unaware that you are but seconds away from mayhem! But mayhem, I must stress, is rather difficult to achieve.

To sum up, it does just about everything that all the others do, it is definitely the cheapest, it will handle the Hewlett Packard plotter quite happily, and it is one that a secetary will feel more at ease with on a first encounter. However, it does have limitations, and can be awkward to use at times. So, onto . . .

MicroScript

Available from Supersoft, on 01-861 1166, at 425.00 pounds. A little bit more expensive, you might think. True, but this program doesn't come on a disk or tape, it comes on a completely new board, complete with its own set of chips.

What precisely does this mean to you, the end user? Principally, it means you don't lose any of your available memory when the program is running, so you can store far greater areas of text than you can with any other word processing program.

The board comes complete with 46K of ROM and an extra 2K of RAM, and is pretty easy to fit

(two minutes and a screwdriver!). More importantly, you don't lose any of the sockets that are spare in the existing machine, as any empty slots are readily accessible from the new board.

The only time your disk drive comes into use is for storing text, or for outputting a very large mailing list for instance: it hauls the names and addresses off a disk file already created (not necessarily from MicroScript either). Apart from that, a printer 'profile' is loaded up from disk when you start to use the program, so that the board is not filled with routines for hundreds of different printers that you'll never use. You just choose the one you want at the start, and that's it.

In terms of actual use, it was designed to take the best of Wordpro and Wordcraft, and on the whole did rather well. it's nearer to Wordpro than any other program, as most of the formatting commands etc. are borrowed from there, and so will be quite familiar to anyone used to that particular package. It borrows from Wordcraft in its use of the display at the top of the screen, telling you precisely what you're doing at any particular time.

In common with Wordform it does NOT use the wrap around feature, but rather moves words to the start of the next line where necessary.

And in common with all of them, we find right justification, global search and replace,. delete paragraphs, background printing, and so on. In addition, we also have the ability (depending on your printer) to print superscripts and subscripts, an oft-neglected use of word processors.

One major point in its favour is ease of use. As space was not a premium (put all the code on a board and you don't have to worry about packing the maximum amount of code into the minimum amount of space), they've been able to make the package very user friendly, and as a result it's very easy to use.

Again to sum up, this is the most expensive of our three programs, but probably offers the most features, and by far and away can hold the most text. A novel approach to put it on a board: time, and sales, will tell if it was the correct approach!

Superscript

Someone, someday, must think up a totally new name for a word processor: this is getting ridiculous!

Superscript achieved instant fame and notoriety when someone (we shall name no names!) took out an injunction against ICPUG, who were

then distributing it, and politely suggested that they stop selling it. Well, when the dust settled down, it was being distributed by Precision Software (tel. 01-330 7166), the price had risen from 35 pounds to 245 pounds (although they do have a lot of special discount schemes), and the whole affair took on a rather more professional image.

Coming on a protected disk, the program still allows you up to 20,000 characters of text available in RAM at any one time, this time using the wrap around technique of typing. As with MicroScript, it has a lot in common with Wordpro in its ease of control commands, although the amount of code taken to operate these is staggeringly less. It can also read Wordpro (and Wordcraft, and Silicon Office, and . . .) files either straight, or for merging into its own existing files.

As usual, all the standard functions that one now expects are included in the package, and a lot of care has been taken to get the best possible use of whatever printer you happen to be using: ribbon colour change, underlining, and so on. As a bonus, it will run on ANY Pet provided you have more than 8K of memory, from the old 2001 machine right up to the 8096.

Ease of use is very straightforward, although one annoying feature remains. Why, oh why, can't you cursor back from column 1 of a line to column 80 of the line before? It takes you a long time to move the cursor all the way along to the end. One must assume that Simon Tranmer, the author, had his reasons.

Apart from that, a very good program, and if I had to choose one it would definitely be this one. It's reasonably cheap, it is easy enough to use, has all the features that you'll ever need (and probably an equal number that you won't, or you'll never even discover!), and all told is probably the best one around at present.

Whatever you may think of Commodore, they are certainly not fools, and it says a lot for Superscript that the word processing package they want re-written for future machines is . . . Superscript!

Conclusion

Three word processing packages, all offering something different. Which one to buy? Well, the obvious thing to do is write down your own particular requirements (and not just now: try and think of the future as well), and armed with this go along to your local dealer and demand a demonstration of all three.

INTERNAL MEMO

I want a Word Processor that's simple to understand, fast, and easy to use...

..it'll need up to 20,000 characters of text, a wide, clear screen, and be able to spell!

She needs 'Superscript'!

Superscript Features

- Provides full screen edit, delete, erase, insert, transfer and document merge facilities.
- Simple facilities to send mailshots to standard address lists.
- Powerful aids to produce tables with wide screen, horizontal, decimal and vertical tabs.
- Search with optional replace
- Comprehensive printer controls with control of margins, lines per page, underlining, bold print, super and sub scripts, variable line and character pitch.

Superspell Features

- Dictionary in excess of 30,000 words.
- User definable dictionary with facilities to add, delete, print or merge with standard dictionary.
- Spelling checker verifies largest *'Superscript'* document in less than two minutes.
- Displays totals of words, different words and unrecognised words.
- Editing of unrecognised words in document includes options to accept, ignore, change or add to user dictionary.

'Superscript' transforms your Commodore computer into a true Word Processor, enabling your secretary to turn out high quality letters, mailshots, quotations, etc., faster and easier than ever before.

But spell? – Adding *'Superspell'* gives you access to an extensive dictionary with automatic checking of any document entered, enabling recognition of spelling errors and mistypes.

If she wants a better machine, and you want the very best of Word Processing, then you both need a Commodore with *'Superscript'* and *'Superspell'* available from your local Commodore dealer.

Precision Software

Superscript

A Professional's Word Processor

Precision Software Limited,
4, Park Terrace, Worcester Park,
Surrey KT4 7JZ, England.
Telephone 01-330 7166

Superscript **and** ***Superspell*** run on the 2001, 3016/ 32, 4016/32, 8032 and 8096 Commodore computers, 2040, 3040, 4040 and 8050 disk drives, all Commodore printers and a wide range of letter quality printers.

Prestel For Your PET

David Annal

It is now possible to couple your PET, any model, to a RS232 Tantel adaptor, and use it to call up Prestel pages, view them on the PET screen, save them on disk and, what is particularly exciting, download computer programs and convert them to BASIC. Once converted, they can then be saved or run in the usual way. Programs are already available together with club information and news — see ICPUG pages starting on 80061819.

UART BOARD

The means whereby all this can be achieved is the UART coupling board and associated software produced by Y2 Computing Ltd. UART stands for Universal Asynchrous Receiver Transmitter (which can now be forgotten) and its function is to convert parallel to serial signals and vice versa. This particular chip is mounted on a small circuit board, together with a few associated components. It is supplied to plug into the middle (UD4) socket of your PET. If you have already got a utility chip in this socket, it is still possible to use it as the board has a duplicate socket included. Simply remove the IC already there and plug it into the socket on the board. This will work for all 2K Chips, such as Toolkit, etc. The board can be supplied to plug into other sockets if required. Flying leads are connected from the board to other points of the PET circuit board via shakeproof prods. A lead from the boards comes out from the side of the PET to connect into the Tantel via a DIN plug. All these connections and installation instructions are described in a booklet accompanying the board. The are full and detailed and include easy to follow diagrams. The whole installation takes only a few minutes.

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What your need.

The Telesoftware Tantel Adaptor is a MODEM device (Modulator/DEModulator) which will plug into a Prestel jack provided by British Telecom next to your phone. A colour TV set will plug directly into the adaptor via its ordinary aerial socket. These two will now function as a Prestel terminal and the phone nos. of the nearest Prestel computers can be programmed into the adaptor. The Prestel computer can now be dialled automatically using the keys on the adaptor, and your requested pages will be shown on the TV in colour.(Various registration procedures have to be followed in the first instance. They are not discussed here but are adequately covered in the papers accompanying the Tantel). The phone line can be acquired or disconnected by pressing appropriate keys. Other makes of MODEM are likely to appear before long and some already exist, although more expensive.

Now although the above set-up is satisfactory for viewing pages of your choice and for answering back in a smimple way, such as revealing hidden answers, etc, it cannot make use of other superb facilities now being provided on Prestel. These include the sending

of messages to other users and the general use of the alpha-numeric keys in answering questions, placing orders, etc. A Tantel is available with keys but why not make use of those you already have on your computer and use the Y2 board? Several other advantages follow which we will discuss below.

Character set

First, it is necessary to deal with the display which appears on your computer screen. Unlike the TV set, this will obviously be in monochrome. This need not be a disadvantage as any colour TV set connected to the aerial socket will still show the display in full colour even though the PET has taken control. The TV is not now essential and could be removed back to the heart of the family and thus avoid arguments! The PET screen will continue to function as the display, but there is a snag . . . Prestel graphics are not the same as the PET graphics and a full display of some Prestel characters is not possible. This may not matter much if you are only receiving the printed page, but graphic pictures will not look right. Y2 will provide a chip, at extra cost, which replaces the character generator in your PET. In the case of the 'fat 40' and 8032, this provides the full Prestel set and all graphics will reproduce correctly on the screen. On 7'' screens, the chip will not interfere with normal PET graphics used in upper case mode as these are still there. However, in lower case mode, used by Prestel. the graphics associated with shifting the top row keys and numeric keys now become the Prestel set. Fractions and pound signs also appear! For most applications, the Prestel character ROM can remain in situ all the time.

What will it do?

Once the computer had been plugged into the RS232 socket of the Tantel, all control is possible from the computer keyboard and the Tantel keys are not required, although they will still function in an emergency. In order to achieve this transformation, the first program on the software disk supplied with the UART board is loaded in the manner appropriate to your model.

Off-line mode.

When first loaded, the program enters the off-line mode and displays a menu which gives the user the choice between a display showing all the normally hidden Prestel control characters and a normal screen. The former would only be of interest to those editing their own pages. You are next asked if you wish to display PET characters or Prestel ones. The answer depends on whether or not the Prestel character ROM has been fitted as described above.

In the off-line mode, facilities are provided to recall a previously recorded page from disk, alter, or add to, the pre-programmed telephone numbers of Prestel computers, change the modes above, exit the program altogether, or enter the on-line mode. (Note that phone numbers are stored in the *Tantel,* which has a battery backup. They will not therefore be lost when the computer, or Tantel, are switched off).

On-line mode

This allows you to call up the Prestel computer choice, using the numbers programmed above. You may then; view pags at will, copy any interesting pages to disc, write letters to friends, answer advertisements, book tickets and generally make use of all the Prestel facilities normally available. The ability to store pages on disk means that your are connected to the phone line for a shorter time and can view your selectins at leisure when off-line and not clocking up phone bills! Normal extra facilities are readily available such as 'reveal', 'double height', etc, but will only be seen on a TV connected to the Tantel.

Telesoftware.

The great advantage of using a computer connected in this way is that programs, especially provided for the purpose, can be downloaded directly into your machine, saved on disk and then converted to BASIC to be stored or run at will when off-line.The procedures to enable this to be done are fully detailed in the instructions and are accomplished fairly simply. Two steps are required. Once the telesoftware program page has been located in the usual way, it is accessed by the control program which then saves it on disk as an ASCII file. Full error checking is implemented and if this is satisfactory, the program returns to the normal on-line mode. After any further programs have been saved, and at the end of viewing, the off-line mode is entered and the whole program exited. A utility program, also supplied on the same control disk, is now loaded and by this means, the previously saved ASCII file is converted to PET BASIC which can be re-stored for future use and run in the usual way.

Summary

A nice little board giving several extremely useful extra facilities for use with a combination of PET, Tantel adaptor and Prestel. Installation is simple and easy to follow diagrams make it hard to go wrong. Operation is straightforward and the programs do what they are supposed to do. Documentation is adequate. Y2 will support the board and software and models are available for different sockets. Models will also be available for different MODEMS as they are produced.

Contact — Y2 Computing, 5 Kenilworth Court, Watford, Herts. (mail only) or phone Watford 50161. Mailbox no. on Prestel — 092350161. The board and adaptor is also available from Prestel itself at Telephone House, Temple Avenue, London EC4Y 0HL.

General Books of General Interest

Over the last couple of issues of Commodore Computing International we've tended to cover machine specific books: Pet Fun and Games, Learning to Use the Pet Computer, and so on.

However there are a large number of publications available which are non-specific to Commodore computers, but which nonetheless are of interest to users of such computers.

This month we take a look at two such books, a dictionary of Basic, and a book on making a success of microcomputing in your business. A wide range of interests!

Hart's Dictionary of Basic

Compiling a book of this kind must be somewhat difficult, as no two micros share the same dialect of Basic. Ray West did it admirably for the Pet, but the function of this book is rather different and should appeal to all those of you who've at one time or another regretted taking out a subscription to one of the general magazines.

The idea is to provide a set of hints, tips and cross references for converting Basic programs written for a particular machine into working Basic programs on your own microcomputer.

Thus we have a set of appendices covering all the different ASCII codes and what each one is, although unfortunately the Pet section is not very good: I know it suffers from using 'PETSCII' but at least the letters and symbols might have been listed. Not much use to Pet users, who presumably know them all anyway, but of great use to owners of other micros, who will still not have a clue where anything is.

The various memory maps are listed in no great detail, but then for Basic programs they don't need to be. Rather they just serve to provide you with a rough idea of where everything lies. Similarly, a number of Peeks and Pokes are listed out, but this is only a very limited selection. Again, it is not in the nature of the book to go into great detail about one machine or another, but if that is the case why mention them at all?

I can see the merits of the different CHR$ commands being compared: clear screen and so on, as these occur in most programs and will need to be converted. However, a Poke on a Pet to select output mode on all lines seems a mite superfluous to me.

Continuing on the appendices, we then have a few machine specific charts which would be of use in converting programs: Apple colour codes, Vic colour codes, and so on. However, Willie Hart obviously knows something the rest of us don't. Examples of Pet colour graphics codes are given on page 43! When was the last time you saw a colour Pet?

A number of chapters are devoted briefly to describing arrays, variables and so on, and how the different machines deal with them. Quite good, and again useful when you're trying to fathom out some obscure bit of BBC coding. This is followed and surrounded by a number of ideas that the author himself has discovered, and thinks you would find of interest. You will!

But the main body of the book is of course the dictionary of Basic terms. This does not relate to any machine, but just describes them, what they do, and in some cases how they do what they do. At the foot of the page there is room for your own notes on program conversion, and for noting down any particularly knotty problems you may have come across.

From ABORT to YPOS, they're all in there, and should prove to be of invaluable help when going through what the book wants you to do: programs written for other micros!

The 'Willie Hart's BASIC Swop' (membership free with the book), is quite a good idea. This is just a collection of ideas that you, the readers of the book, have submitted. Who knows? That program you're having problems in translating, somebody may already have done it.

Summary

In as much as the book can help in program translation, this one goes a fair way, and the idea of on-going support for the book (and you!) must give it a good lifetime.

So, if you're stuck with a whole load of programs that you've long since given up hope of ever translating, this could be the book for you.

Subject:	*Program Translation*
Author:	*W. Hart*
Title:	*Hart's Dictionary of Basic*
Publishers:	*Sigma Technical Press*
Address:	*5 Alton Road, Wilmslow, Cheshire SK9 5DY*
Tel.:	*0625 531035*
Price:	*5.95 pounds*

Making a Success of Microcomputing in Your Business

Just as there have been a vast number of books published with the aim of teaching you Basic programming, so there have been a similar number of books published which purport to help you buy a business system.

The similarities do not end there: most of the books, in both categories, are pretty dreadful! But, from time to time, a reasonable or even a good book comes along, and Making a Success of Microcomputers in Your Business is thankfully just such a book.

It makes a pleasant change to see a new company (Enterprise Books is the name) making a convincing entry onto the market. The authors have an impeccable pedigree (one of them is chartered secretary and fellow of the British Computer Society, and the other two are both founder members of the University of Manchester Micro-Computer Advisory Service), and there is also a tie-up somewhere along the line with Barclays Bank: Professor Frank H. Sumner, described as Barclays Professor of Microcomputer Applications, also gets his name in there, along with various Barclays Bank logos.

(Ed. note: if you like the review, can I get another overdraft?!)

The book runs logically and smoothly through the jungle of buying a micro, starting off with a chapter on Introducing Success: nothing like aiming high. We're then treated to a run down on computer bureaux, microcomputer hardware and software, followed by a quick guide as to how computers process data, and a look at some typical applications.

Throughout, it's a very straightforward read. Those people who don't know how to turn a micro on are not going to be frightened by computer jargon here. Suppliers and sources of advice, selecting a system and supplier, a chapter on actually going ahead with the deal, are all dealt with in the same manner, with a number of topical comments and cartoons to cheer you up should you ever regret taking a look at micros in the first place.

A special chapter on word processing is the final one in the book proper, before going into a series of extremely useful appendices: some case studies, some of which I'm sure you'll identify with, a number of checklists on costs, suppliers, software and hardware, a list of applications packages, sources of information (unbiased!), and finally a more than useful glossary of computer terms you're likey to come across when acquiring a system.

Summary

Of all the books to arm yourself with before going off into the wilderness of buying a system, this must be the best to appear to date. Easy to read, unbiased in its choice of systems, arguments well presented and clearly put over. All told, an excellent book.

Subject:	*Buying a computer*
Author:	*B. K. Pannell, D. C. Jackso and S. B. Lucas*
Title:	*Making a Success of Micrcomputing in Your Business*
Publishers:	*Enterprise Books*
Address:	*P.O. Box 81, Hemel Hempstead, Herts. HP1 1AA*
Tel.:	*0442 52133*
Price:	*4.95 pounds (plus 40p p&p if ordered direct)*

A Round-Up

Another non-specific book you Forth lovers out there should take a look at is Discover Forth, from our old friends Osborne/McGraw-Hill. Written by one Thom Hogan from Palo Alto, it concerns itself mainly with Forth-79 (one of the appendices lists the required set of Forth words that make up the standard Forth-79) and Fig-Forth, but admits that neither of these are definitive, and include a welcome 'suggestions' list for improvements and enhancements.

Of particular value is a section on improving the readability of Forth programs, which isn't actually very good, particularly if someone hasn't bothered with the comment facility.

The book apparently came about because of a meeting with a Forth enthusiast, who suggested that since no book on explaining Forth existed, and Thom wanted to know all about Forth, that he write one. It'll probably get you interested as well.

Finally for this month, that well-known magazine Compute! brings us the 'Compute!'s First Book of Pet/CBM, as far as I know only available from Compute! themselves (625 Fulton Street, PO Box 5406, Greensboro', NC 27403, USA) at a price of $12.95.

This is basically a fine selection of articles that have appeared over the years, but only comes forward in time to about 1980, so perhaps a lot of the book is of limited use to later Pet owners.

The material is of a high technical content, and unusually for this type of book they have corrected errors that appeared when the articles were first committed to print (although, as Ron Geere tells me, Supermon is still referred to as Superman! You'll believe a monitor can fly).

Still, if you can persuade someone to get it for you, it'd be worth it.

Computers for Opthalmic and Dispensing Opticians

Peter Hunt

While this article is written mainly with the object of introducing the benefits of computers to members of the optical professions, the use of technical terms has been kept to a minimum, affording the layman an interesting look inside these professions.

Incidentally, an early link between the computer world and that of the optician came in 1847 when Charles Babbage, the 'father' of the computer, invented the opthalmoscope. This instrument, which the opthalmic optician or surgeon uses to see the interior of the eye through its pupil, was perfected and put to practical use by the German physician Herman von Helmholtz four years later.

While there is an opthalmoscope in every practice, very few opticians have yet welcomed the computer into their surgeries. There are several reasons for this; first comes cost. Opticians rely heavily on National Health Service work for their income and this is not high enough in the large number of small practices in this country to support the purchase of expensive equipment in addition to the very expensive professional instruments, which are essential and completely unsubsidised.

However, these practitioners probably do not realise how low the cost of computers can be. A really efficient configuration can cost under £3,000, and leasing for small monthly payments can maximise tax relief.

In these circumstances, considering the time and money that a computer can save, it may well cost more to decide against having a computer than to install one!

The second reason may be fear; many fear the unknown power of the computer, imagining it to possess almost magical or mystical properties which are in some way dangerous. It takes only a little experience of using a computer — visit your friendly local dealer — to understand at least the basis of how a computer works. Next comes conservatism — an unwillingness to change from outdated and inefficient working methods, an inertia over the upheaval of reorganising the creaking old system, although present day economic pressures dictate that every business may be as efficient as possible or perish — and the professions are no longer above commercial pressures.

A possible fourth reason why more opticians have not take to computers is the lack of programs written specifically for the profession. I hope to remedy this with my 'Opti-compute' series of programs, which has already been launched with the Commodore-approved 'Pricing', of which more later. In addition there are many general purpose programs available and suitable for immediate use in the practice; for accounts, stock keeping and word processing, to name a few.

The Organisation of the Practice

The first contact between patient and practice is the Reception, when he or she makes an appointment. A program may be set up to give virtually instant access to what are in effect 'pages' of a diary displayed on the screen, allowing entries and deletions, and a print-out of each day's appointment list. Similar facilities may be seen in use for hotel bookings, air travel reservations, etc.

Next, the patient arrives for the consultation, examination, refraction or sight test — to give but the four commonest terms used for the same operation. The consultant will require a record sheet bearing the patient's name, address and other facts, plus details of previous visits including any pathology noted, previous spectacles worn, standard of visual acuity obtained, muscle balance, etc. Individual opticians vary widely in the amount of detail they require on their records. Some will record the barest details, others will write a small thesis on each patient. A standard system, such as would be required by computerising records, may encourage the lazy to more efficient record keeping and the verbose to more concise expression, by the use of standard phrases and coding.

Opticians' receptionist seated at the Commodore computer.

Allowing for a number of visits, it would be wise to allow about 1,000 bytes of storage capacity per patient. The Commodore 2040/3040/4040 disk drives give about 170K or 170,000 bytes per diskette, allowing 170 records to be stored. For a practice having 5,000 record, 30 diskettes are required — not much more than one per alphabet letter. Compare this with the space required by filing cabinets holding the same quantity! Even better are the newer 8050 Disk drives, giving 500K or a half megabyte per diskette, thus requring only 10 diskettes. For really efficient file handling it would be better to have all records on one disk, and for this a hard disk unit is essential; these are increasingly available for microcomputers.

Since we must concede that equipment does occasionally fail, and diskettes can be damaged, it is wise to have a back-up copy of each disk. This is no hardship as the computer will do this for you quite unaided apart from the physical effort of inserting the disks, and offers the tremendous advantage of security. Only one who has experienced the destruction of his paper records by fire will entirely appreciate the immense losses and difficulties this causes and fully understand the advantages of this approach.

For good record handling it is important to have 'random access' to files on disk; in fact the 'relative record' facilities of the 4040 and 8050 disk drives are really necessary for efficient use, and I would recommend against buying any disk drive that does not give you true 'relative record' handling, as such a system makes and holds its own index system, allowing the computer to retrieve any record directly without first reading unwanted information.

There are two means of access to records held on disk. The most rapid is display on the V.D.U. screen. This may be all that is required, for example to check a detail, a date, or alter an address. Secondly, a print-out may be obtained; the full record will usually be required in printed form when the consultation takes place. The practitioner may make handwritten entries on a blank form, later to be entered into the computer by the secretary thus updating the record on disk.

Another approach, used in some doctors' practices, is to keep computer records in parallel with the written notes. The computer record contain only the essential information such as name and address, date of last visit, current prescription, etc.

In this way security is provided for the records, and rapid access to certain details is possible. The bulkier files are still available for those who wish to store field charts, copies of letters and other documents with the records. The computer records would be used for retest reminder letters, also for statistical analysis.

After the Consultation

The consultation may lead to three possible conclusions:— a. spectacles not required or no change needed; b. referral to the G.P. for suspected pathology; c. spectacles required.

The referral case suggests the possibility of standard letters to the G.P. stored on disk, into which the patient's details are incorporated. Most word processing programs have this capability.

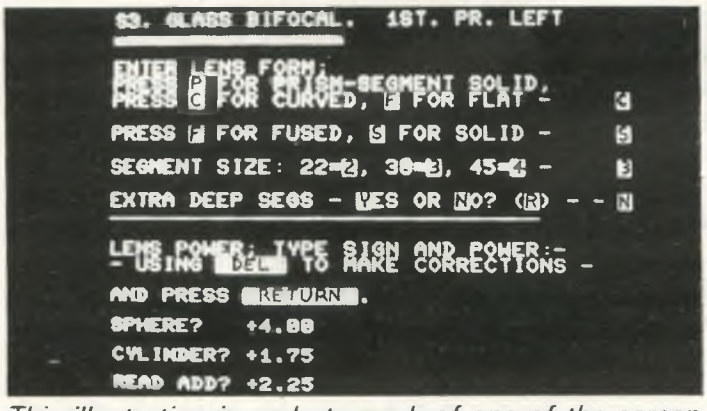
Prescribing new spectacles leads to the next stage of 'dispensing', deciding on the type of lenses and choice of frame style, or contact lens fitting. Few patients realise the vast range of lens types available. This is often because they insist on one general purpose pair of specs to do everything, with the possible result that nothing is done really well. Dare one suggest that sometimes the dispensing optician is to blame, simply because of the difficulty in checking on the availability of so many lens types. Because there are certain limitations on the possible combinations of lens type—lens power—lens size, it is often necessary to consult several manufacturers' catalogues — some much easier to use than others. How much easier to have an instant display on the screen of any desired lens type.

The same dispensing program may contain a section to handle lens calculations such as vertex distance adjustments, lens thickness, prism effects, and contact lens calculations. Add to the above facilities the ability to store and display almost instantaneously the cost of all lens types and giving the patient an immediate quotation, and you may well wonder how you have managed without a computer.

When it comes to choice of frame style, there are obvious advantages in being able to call up a display for any frame, giving details of colours

and sizes available and the stock held of these, together with the supplier's name, price, etc. Such a program could also display a list of frames out of stock for any particular manufacturer when the representative calls, and in addition assess the 'ageing' of stock allowing unpopular or unprofitable lines to be weeded out.

Next comes the ordering of the complete spectacles:— lens prescription, type of lens, extras such as tint, frame details and measurements. At this stage one bad error can be so costly as to turn a profit into a loss on any order. This risk is minimised when the record system outlined above is linked to a dispensing routine giving a printout of an order to the factory. Of course, the order may be passed direct to a computer at the factory via a telephone modem for speed and accuracy.



This illustration is a photograph of one of the screen displays from Mr. Hunt's 'Pricing' program, and shows how a sequence of single key entries has been made to choose the lens type.

Finally the spectacles are ready. Notifying the patient to collect, rendering an account, giving a receipt — all may be based on information already in the computer which will happily print it out in any desired form, and address the envelopes. Outstanding orders taking longer to arrive than they should, may be brought to your attention at intervals — as may outstanding accounts.

General Clerical Work

Despite the 'finally' which commenced the last paragraph the work does not end here but passes to the long-suffering office staff — who in a small practice is probably also the receptionist, secretary, coffee maker, etc. One of the most tedious and time consuming takss remaining is the pricing of N.H.S. claims. Every single N.H.S. lens dispensed must be checked against a complex price list, various extras, fees, charges and prices also found, and columns totalled. The nature of this job, plus the time it takes to train someone to do it, led me to choose this as the first program, 'Pricing', for my series.

The use of such a program saves time and thus money, and can also save loss of cash from inaccurate pricing such as omitting extras, some of which are very expensive. Moreover, such a program is very easy to use and is therefore a useful one to familiarise staff with the use of a computer. All the fees and charges from the Statement are in the program, requiring only one keystroke replies to questions appearing on the screen. The end result is a display on the screen which is a facsimile of the pricing section of the G.O.S.2B form, with all the figures entered, requiring only to be copied onto the actual form. One hopes that the authoities will eventually permit the use of computer print-outs of the form.

Other uses of the computer in this department are for word processing, greatly facilitating the production of both standard and one-off letters and other documents, and also for automatic generation of retest reminder letters to patients at pre-determined intervals.

Approaching the Installation

All the programs suggested above may be merged into a single comprehensive practice control system. This gives certain advantages, above all a co-ordination of information so that any item of data such as a lens prescription need be entered only once to be used by different routines. The disadvantage is that every part of your system already operating prior to computerising will have to be adapted, simultaneously, to the new system — a major upheaval in any business. In addition, you must be very sure of your equipment, and even then have local and adequate repair facilities or back-up equipment, as your whole working system has become totally dependant on smoothly functioning machines.

For this reason, my own approach to computers in the optical practice is to suggest a modest beginning which may be expanded later, allowing a free choice of equipment to suit the pocket, and the purchase of individual programs to suit requirements. More aspects of the practice system may be computerised as time passes and experience shows how, giving a gentle and painless entry into the world of computing which I call the 'modular' approach.

Peter Hunt is a leading Opthalmic Optician in the South West of England, and has written a suite of programs for use in the opthalmic trade.

INVERT MATRICES FOR £75!

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Who's Afraid of Machine Code

Peter Gabor

Well, frankly, I am . . .

I would not like you to think, that I do not enjoy writing in Machine Code. Actually, a smoothly running MC program can really give a feeling of satisfaction. One can even forget the nervous breakdowns experienced while preparing the program, when the PET hung up for the umptieth time . . .

It really is not too difficult to write short programs in Machine Code. Such routines can then be called from a BASIC program. If chosen and used properly, they can speed up the program considerably, especially if we are dealing with sorts, or other routines with repeating loops. Many useful utilities appear in Magazines, others can be obtained from Software Houses at reasonable prices.

Here are a few tips, that might help you when preparing composite BASIC/M.Code programs.

1. Use reloctable programs, whenever possible. I refer to programs without direct jumps or tables. No codes have to be changed when transferring the program from one starting location to another. By the way, it is not very difficult to avoid direct jumps in short programs. Testing a flag with a known status makes an unconditional branch possible. For example, if we know, that before the required jump the Accumulator has been loaded with a non-zero value, a BNE instruction will do the trick.

2. I prefer to use only BASIC subroutines while developing a program. Later on I can add the Machine Code routines and replace the GOSUB commands with SYS calls. It is quite true, that this is not such a simple matter if you do not own a Programmers' Utility with "Search and Replace" functions. But I have the feeling, that if you read this far, you will have something lurking in the depth of your spare sockets . . . Anyhow, if you wish to start with Machine Code subroutines right away, you can load them into high (protected) memory.

3. When you are reasonably certain, that your Program is complete (except for some minor changes which you will have to make every Tuesday and Thursday for the next couple of years), you can transfer the Machine Code to the end of BASIC and merge the programs. It will have to start at the address contained in the 'End of Basic' pointer (PEEK(42)+PEEK(43)*256). Actually, before checking for End of Basic, I would add a few filler-lines to the end of the program (REM statements with irrelevant contents). The monitor has to be used for SAVE-ing the composite program (.S(0:FILENAME), 08,0400,ENDADRESS+1).

4. This new program, when loaded, will adjust all the pointers as if end of MC were end of Basic. It can be edited, and any later regular SAVE will save it including the machine code. Be careful, if you use Programming Aids! Some commands might involve resetting all the pointers. A SAVE after this might save only the BASIC part. So better keep backup copies ready!!

5. The purpose for the filler lines is to enable us to edit the program, without changing SYS addresses. By now you should be familiar with the first few bytes of your Machine Code sequence. Using the Monitor, you can always verify, that they are indeed sitting in their proper place. If not, then count the number of bytes of offset, exit from the monitor and delete (or add) the same number of letters to your filler line. Actually this is only important, if you wish to keep the SYS addresses unchanged or if you have Program Overlays using the same routines. By the way, your overlay has to be shorter than the original BASIC main program, otherwise it will destroy the Machine Code.

Deleting a line from the main program (or part of it) without increasing filler length might cause disaster in such a case.

6. It is very convenient, to define the entry point of the MC routine in a variable. I have written a BASIC Program making frequent calls to Supersoft's "Speedsort" and my own "Truncate", both of them fully reloctable programs. The composite program has Speedsort at the end of BASIC and Truncate right after it. One of the first lines of the program reads: SO=14848: TR=SO+458. The routines are called by 'SYS SO, X$(0)' and 'SYS TR, P$' respectively. Changing the location of the MC routines will only require adjustment of the statement defining SO; no search for all the 'SYS' calls is necessary.

Reading the outline of this article, I have just discovered, that Machine Code is not so bad after

Peter Gabor is one of our regular contributors from overseas, and regularly comes over from Israel for a visit. Here he takes a look at machine code from the beginners point of view, and proves it's not quite as daunting as you first think. He illustrates this with a program called Truncate, a short routine for truncating relative files.

all and that I am not afraid of it any more. Are You? . . .

TRUNCATE

BASIC 4.0's support of relative files makes the writing of sophisticated file-handling programs easy for even the inexperience programmer. I do not intend to write about those lovely new commands available. If you can't remember all of them, just DOPEN= your Manual, it's all there.

By the way, this '=' is important and tends to be omitted. Which of course results in an empty file or your inability to read it back. So don't forGET= it when PRINT=ing or INPUT=ing. But this was only off the RECORD=. Actually, I wanted to discuss the problem of pading or rather "unpadding" the various fields in a file.

Now we all know, that field length has to be constant in relative files. So we left-justify our information and pad the fields with spaces before printing to the file. In many instances these spaces have to be removed during file processing.

In BASIC this is quite simple; one might use the following subroutine:

```
1000 IF VAR$="" OR VAR$=CHR$(32) THEN VAR$="": RETURN
1010 IF RIGHT$(VAR$,1)<>CHR$(32) THEN RETURN
1020 VAR$=LEFT$(VAR$,LEN(VAR$)-1): GOTO1000
```

This is all right, if one does not care about speed (it takes about a second to truncate 46 spaces). If, however, you have many or alternatively very long fields, your program might slow down excessively because of the truncating process.

As it is usual in such cases, Machine Code can save the day. The following Program can be typed in at any location. (you can safely move it around with "Supermon") and is called by "SYS NN,VAR$" where NN is the starting address of the program and VAR$ can be any type of string variable..

```
.:  1000 20 F5 BE 20 2B C1 A0 02
.:  1008 B1 44 85 5D 88 B1 44 85
.:  1010 5C 88 B1 44 F0 52 85 22
.:  1018 A8 91 5C C8 A9 FF 91 5C
.:  1020 A4 22 88 08 B1 5C C9 20
.:  1028 D0 05 28 F0 04 D0 F3 28
.:  1030 C8 98 A0 00 91 44 A8 C8
.:  1038 C9 00 F0 2D C8 84 22 A5
.:  1040 30 38 E5 22 B0 02 C6 31
.:  1048 85 30 A0 01 91 44 C8 A5
.:  1050 31 91 44 A4 22 88 A5 45
.:  1058 91 30 88 A5 44 91 30 88
.:  1060 08 B1 5C 91 30 28 D0 F7
.:  1068 60 91 44 C8 91 44 60 AA
```

Sketching and Plotting Routines for Pet and Vic

More vision than sound this month, with two sketching programs for the unexpanded Vic (just type 'em in and run! They're short enough programs), and a double density plotting machine code subroutine for the Pet: Basic 2 40 column machines this one.

SKETCHING 1 : VIC 20

```
2 FORJ=36874TO36876:POKEJ,0:NEXT:POKEV+2,15
5 POKE36879,8:PRINT"[illegible]":V=36876:POKE36878,15:R=0
10 PRINT"[illegible]"
20 S=7680:C=38400:W=0
30 X=PEEK(S):POKES,X+128:POKEV,200
35 FORJ=0TO25:NEXTJ
40 POKE37154,127:J0=-((PEEK(37152)AND128)=0):POKE37154,255:P=PEEK(37151)
45 GETA$:IFA$="C"THENGOSUB200
47 A=VAL(A$)-1:IFA<>-1THENR=A
50 J1=-((PAND8)=0)
55 IFWANDS>7743THENX=CR
60 J2=-((PAND16)=0)
70 J3=-((PAND4)=0)
80 FB=-((PAND32)=0)
90 POKES,X:POKEV,0:IFW=1ANDS>6721THENPOKEC,R
100 IFFBANDS<7743THENCR=X:W=0:GOTO30
110 IFFBANDS>7742ANDM=1THENW=W*-1+1:M=0
115 IFFB=0THENM=1
120 IFJ0ANDS<8185THENS=S+1:C=C+1
130 IFJ1ANDS<8164THENS=S+22:C=C+22
140 IFJ2ANDS>7680THENS=S-1:C=C-1
150 IFJ3ANDS>7701THENS=S-22:C=C-22
160 GOTO30
200 POKE36876,0:FORJ=1TO100:NEXT
210 GETA$:IFA$=""THEN210
215 A=VAL(A$):A=A-1:POKE36879,(PEEK(36879)AND15)+A*16
220 FORJ=1TO100:NEXT:A$=""
230 GETA$:IFA$=""THEN230
235 A=VAL(A$):A=A-1:POKE36879,(PEEK(36879)AND240)+A+8
240 A$="":RETURN
READY.
```

SKETCHING 2 : VIC 20

```
10 POKE36879,8:PRINT"[illegible]JUST A MOMENT"
20 X=PEEK(56)-2:POKE52,X:POKE56,X:POKE51,PEEK(55):CLR
30 CS=256*PEEK(52)+PEEK(51)
40 FORX=CSTOCS+511:POKEX,0:NEXTX
42 FORX=CS+256TOCS+263:POKEX,255:NEXTX
45 W=0:F=0:Q=0:CR=0
50 PRINT"[illegible]SKETCHING[illegible]"
52 PRINT"[illegible]C=CORRECTION[illegible]"
55 PRINT"[illegible]Q=QUIT[illegible]"
57 PRINT"[illegible]N=NEW DISPLAY[illegible]"
60 PRINT"[illegible]"
65 FORJ=38400TO38884:POKEJ,1:NEXTJ
70 PRINTTAB(7);"@ABCDEFG":PRINTTAB(7);"HIJKLMNO":PRINTTAB(7)"PQRSTUVW"
71 PRINTTAB(7);"XYZ[\]↑←":PRINTTAB(7);" !"+CHR$(34)+"#$%&'"
72 PRINTTAB(7);"()*+,-./":PRINTTAB(7);"01234567":PRINTTAB(7);"89:;<=>?"
80 C=0:Y=0:X=7
85 POKE36869,255
90 N=PEEK(CS+C*8+Y)
95 R=C-INT(C/22)*22+INT(C/22)*8
100 L=NOR(2↑X):POKECS+C*8+Y,L:FORJ=1TO1:NEXTJ
101 GETA$:IFA$="Q"THEN230
102 IFA$="C"ANDQ=0THENCR=CR*-1+1:Q=1
103 IFW=1THENN=NOR(2↑X)
104 IFCRTHENN=NAND(255-2↑X)
105 POKECS+C*8+Y,N
110 IFA$<>"C"THENQ=0
115 IFA$="N"THEN40
120 POKE37154,127:J0=-((PEEK(37152)AND128)=0)
130 POKE37154,255:P=PEEK(37151):J1=-((PAND8)=0)
140 J2=-((PAND16)=0):J3=-((PAND4)=0)
150 FB=-((PAND32)=0)
160 IFFBANDF=0THENW=W*-1+1:F=1
165 IFFB=0THENF=0
170 IFJ1ANDC>55ANDY=7THEN180
175 IFJ1THENY=Y+1:IFY>7THENY=0:C=C+8
180 IFJ2=0THEN200
190 IFC=0ANDX=7THEN200
195 X=X+1:IFX>7THENX=0:C=C-1
200 IFJ3ANDC<8ANDY=0THEN205
202 IFJ3THENY=Y-1:IFY<0THENY=7:C=C-8
205 IFJ0=0THEN220
210 IFC=63ANDX=0THEN220
215 X=X-1:IFX<0THENX=7:C=C+1
220 GOTO90
230 POKE36869,240:POKE56,30:END
READY.
```

This machine code program allows points to be plotted on the screen in double density format (ie. screen dimensions are 80 x 50 points). This is done by using the quarter square graphics characters. This program however is much cleverer since it takes into account all the combinations of quarter space characters which can be placed in a single character space. The graphics character occupying a single character space will change when new points are plotted within that character space, without affecting existing plot points in the space. The program requires three variables which can be passed from a Basic program using POKE commands. These variabls are the X coordinate passed as one byte, the Y coordinate passed as two bytes (the second byte is always set to zero). The third variable is set to 0 if the point is to be added to the display, and 1 if it is to be deleted. The program incorporates error checking and will set an error flag if an error condition is present. The error states are: firstly, plot coordinates are out of range, and secondly a plot point already exists at the coordinates specified. The program is located either as a machine code program using the monitor, or with a Basic loader. This is contained in lines 10-400 of the program LINEPLOT.

Example: To plot a point at X-Y coordinates 14-25 use the following commands.

```
POKE 84,14    X co-ordinate
POKE 85,25    Y co-ordinate LSB
POKE 86,0     Y co-ordinate MSB
POKE 89,0     add point
```

The check the error status.

```
PEEK (998)
```

Lineplot

This program is an example of the use of the previous machine code program; lines 10-400 are a Basic loader for LPLOTSRC. The program is designed to draw lines in quarter square characters between two sets of screen co-ordinates. These are input in line 1005. The remainder of the program calculates the position of the next point in the line, (parameters X1 and Y1), which are poked into the relevant locations prior to jumping to the machine code program in line 2270. The program could be easily modfied to act as a subroutine within a larger program.

```
 1 REM ******************************
 2 REM *PROGRAM TO DRAW LINES ON SCREEN
 3 REM *USING DOUBLE DENSITY MACHINE
 4 REM *CODE PLOT SUBROUTINE.
 6 REM ******************************
 7 REM
 8 REM
 9 REM **MACHINE CODE LOADER**
 10 DATA826
 20 DATAA9,00,8D,E6,03,85,5A
 30 DATAA5,55,C9,32,90,03,EE,E6,03
 40 DATAA5,54,C9,50,90,03,EE,E6,03
 50 DATA2C,E6,03,F0,01,60
 60 DATAA9,31,38,E5,55,85,55
 70 DATA46,54,26,5A
 80 DATA46,55,26,5A
 90 DATA06,55,06,55,06,55,A5,55,06,55,26,56,06,55,26,56,18
 91 DATA65,55,85,55,A5,56,69,80,85,56
 100 DATAA6,5A,A9,01,85,5A,E0,00,F0,05,06,5A,CA,90,F7
 110 DATAA4,54,B1,55,A2,00,DD,CE,03,F0,0B,E8,E0,10,90,F6
 120 DATAA9,04,8D,E6,03,60
 130 DATAA5,59,D0,07,8A,05,5A,18,AA,90,0A
 140 DATAA5,5A,49,FF,85,5A,8A,25,5A,AA
 150 DATAAD,40,E8,49,20,29,20,F0,F7
 160 DATABD,CE,03,A4,54,91,55,60
 170 DATA20,7E,7B,61,7C,E2,FF,EC,6C,7F,62,FC,E1,FB,FE,A0
 180 DATA*
 200 READL
 210 READA$
 220 C=LEN(A$)
 230 IFA$="*"THEN400
 240 IFC<1ORC>2THEN320
 250 A=ASC(A$)-48
 260 B=ASC(RIGHT$(A$,1))-48
 270 N=B+7*(B>9)-(C=2)*(16*(A+7*(A>9)))
 280 IFN<0ORN>255THEN320
 290 POKEL,N
 300 L=L+1
 310 GOTO210
 320 PRINT"BYTE"L"=["A$"] ???"
 400 PRINT"□";
 600 REM
 700 REM  **ROUTINE TO DRAW LINES FROM START TO END COORDINATES**
 800 REM
 1000 PRINT"■";
 1005 INPUTX1,Y1,X2,Y2
 1010 GOSUB2000
 1015 PRINT"■                    "
 1020 GOTO1000
 2000 REM
 2010 REM **CHECK COORDINATES IN BOUND**
 2020 REM
 2030 IF(X1)=0ANDX1<=79)AND(X2)=0ANDX2<=79)THEN2060
 2040 ER$="X OUT OF RANGE"
 2050 RETURN
 2060 IF(Y1)=0ANDY1<=49)AND(Y2)=0ANDY2<=49)THEN2090
 2070 ER$="Y OUT OF RANGE"
 2080 RETURN
 2090 ER$=""
 2100 XD=X2-X1
 2110 YD=Y2-Y1
 2120 REM  **NEAREST DIAGONAL**
 2130 A0=1:A1=1
 2140 IFYD<0THENA0=-1
 2150 IFXD<0THENA1=-1
 2160 REM  **NEAREST HORIZ/VERT**
 2170 XE=ABS(XD):YE=ABS(YD):D1=XE-YE
 2180 IFD1>=0THEN2220
 2190 S0=-1:S1=0:LG=YE:SH=XE
 2200 IFYD>=0THENS0=1
 2210 GOTO2240
 2220 S0=0:S1=-1:LG=XE:SH=YE
 2230 IFXD>=0THENS1=1
 2240 REM  **SET UP**
 2250 TT=LG:TS=SH:UD=LG-SH:CT=SH-LG/2
 2255 D=0
 2260 REM  **WHILE MORE POINTS DO**
 2270 POKE84,X1:POKE85,Y1:POKE86,0:POKE89,D:SYS(826)
 2280 IFCT>=0THEN2320
 2290 CT=CT+TS:X1=X1+S1:Y1=Y1+S0
 2310 GOTO2360
 2320 CT=CT-UD:X1=X1+A1:Y1=Y1+A0
 2360 TT=TT-1
 2370 IFTT<=0THENRETURN
 2380 GOTO2270
READY.
```

A Very Versatile Pet

Robert Leggat

As owner of a "Fat 40" I've always looked with envy at owners of 80 column Pets when it comes to wordprocessing or listing of programs. It's all so much more easier and professional. So why not buy an 8032? The trouble is first, that I am interested in educational programs, all of which are designed for 40 column Pets, and secondly, that I dare not risk the fury of my children who would be unable to play the many games provided on 40 columns!

There was one other reason. Perhaps I'm not as versatile as others, but I much prefer using the 40 column keyboard; every time I sit down to work on an 8032 I take ages hunting for the quotes sign, print, and so on, and computing becomes a chore. Learning that my 'Fat 40' has a board very similar to the 8032, I wonder whether there are any means by which my Pet could be converted into an 8032.

I learned through the grapevine that someone up north had been working along these lines, and contacted David Jowett, of Windmill Electronics. As a result, I now have a Fat 40 which, by a simple switching arrangement, can instantly become an 80 column machine.

Though the 8032 has a different keyboard, all its functions are implemented in the conversion without any physical changes to the Fat 40's keyboard. To do this some minor changes are necessary:

the multiplication sign becomes Tab, and the shifted colon becomes *

the plus sign becomes escape, shifted semicolon becomes +

This slight alteration is very easy to cope with, and in no way did I find this annoying.

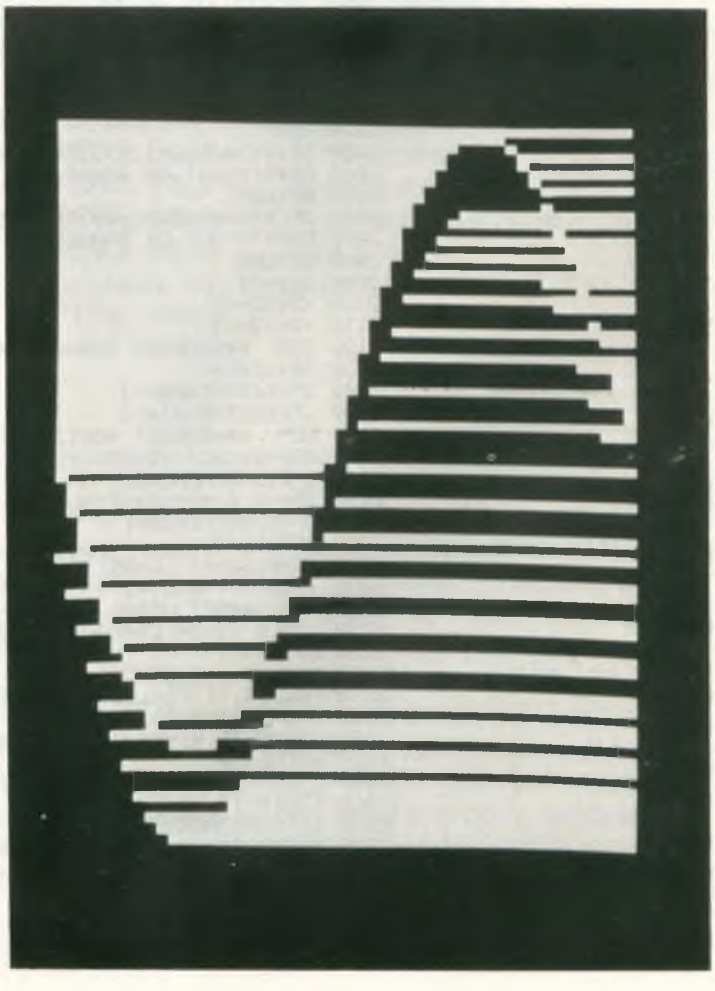
The change from 40 to 80 columns, or vice-versa, is accomplished by actuating a simple switch, and there is no need to switch the Pet off.

Since this conversion was completed this enterprising firm has received a great number of requests of a similar nature, and from the information I have received it seems that all 80 column programs will work perfectly. The two I have: Superscript and Visicalc 80, work a treat.

Encouraged by the considerable interest in this conversion, Windmill Electronics now has variations on a theme sufficient to cater for all tastes. One can have one's 4016 upgraded at the same time as the conversion, or an 8032 can be converted in a 40 column machine, or if one is so inclined, there is a kit complete with instructions for the D-I-Y enthusiast.

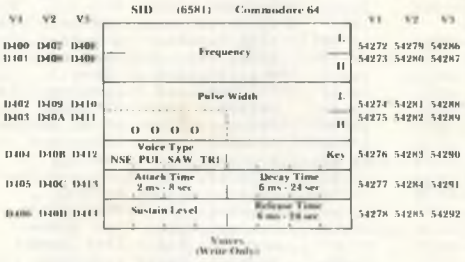
I am more than delighted with this conversion, and consider it to be extremely good value for money. If readers own a Fat 40, and wish to have the best of both worlds, this is without question the answer.

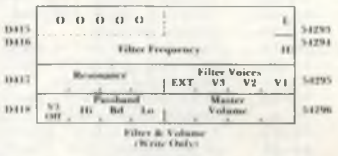
Bob Leggat, a lecturer from Bradford, England, has been using Pets at his college for a number of years now. Recently he purchased a hardware item for converting a 40 column Pet into an 80 column one, and here he tells us how he got on.

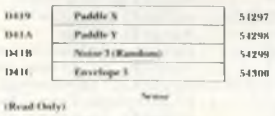


Commodore 64 Memory Map

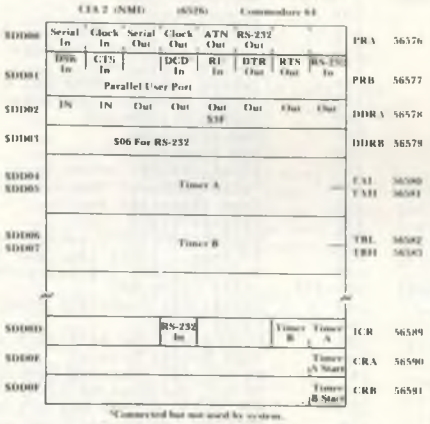
Jim Butterfield

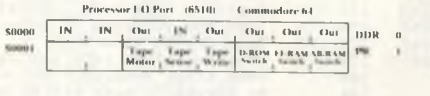


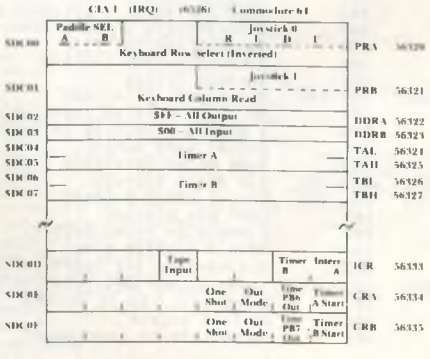




Special voice features (TEST, RING MOD, SYNC) are omitted from the above diagram.







Hex	Decimal	Description
0000	0	Chip directional register
0001	1	Chip I/O; memory & tape control
0003-0004	3-4	Float-Fixed vector
0005-0006	5-6	Fixed-Float vector
0007	7	Search character
0008	8	Scan-quotes flag
0009	9	TAB column save
000A	10	0=LOAD, 1=VERIFY
000B	11	Input buffer pointer/# subscrpt
000C	12	Default DIM flag
000D	13	Type: FF=string, 00=numeric
000E	14	Type: 80=integer, 00=floating point
000F	15	DATA scan/LIST quote/memry flag
0010	16	Subscript/FNx flag
0011	17	0=INPUT;$40=GET;$98=READ
0012	18	ATN sign/Comparison eval flag
0013	19	Current I/O prompt flag
0014-0015	20-21	Integer value
0016	22	Pointer: temporary strg stack
0017-0018	23-24	Last temp string vector
0019-0021	25-33	Stack for temporary strings
0022-0025	34-37	Utility pointer area
0026-002A	38-42	Product area for multiplication
002B-002C	43-44	Pointer: Start-of-Basic
002D-002E	45-46	Pointer: Start-of-Variables
002F-0030	47-48	Pointer: Start-of-Arrays
0031-0032	49-50	Pointer: End-of-Arrays
0033-0034	51-52	Pointer: String-storage(moving down)
0035-0036	53-54	Utility string pointer
0037-0038	55-56	Pointer: Limit-of-memory
0039-003A	57-58	Current Basic line number
003B-003C	59-60	Previous Basic line number
003D-003E	61-62	Pointer: Basic statement for CONT
003F-0040	63-64	Current DATA line number
0041-0042	65-66	Current DATA address
0043-0044	67-68	Input vector
0045-0046	69-70	Current variable name
0047-0048	71-72	Current variable address
0049-004A	73-74	Variable pointer for FOR/NEXT
004B-004C	75-76	Y-save; op-save; Basic pointer save
004D	77	Comparison symbol accumulator
004E-0053	78-83	Misc work area, pointers, etc
0054-0056	84-86	Jump vector for functions
0057-0060	87-96	Misc numeric work area
0061	97	Accum#1: Exponent
0062-0065	98-101	Accum#1: Mantissa
0066	102	Accum#1: Sign
0067	103	Series evaluation constant pointer
0068	104	Accum#1 hi-order (overflow)
0069-006E	105-110	Accum#2: Exponent, etc.
006F	111	Sign comparison, Acc#1 vs #2
0070	112	Accum#1 lo-order (rounding)
0071-0072	113-114	Cassette buff len/Series pointer
0073-008A	115-138	CHRGET subroutine; get Basic char
007A-007B	122-123	Basic pointer (within subrtn)
008B-008F	139-143	RND seed value
0090	144	Status word ST
0091	145	Keyswitch PIA: STOP and RVS flags
0092	146	Timing constant for tape
0093	147	Load=0, Verify=1
0094	148	Serial output: deferred char flag
0095	149	Serial deferred character
0096	150	Tape EOT received
0097	151	Register save
0098	152	How many open files
0099	153	Input device, normally 0
009A	154	Output CMD device, normally 3
009B	155	Tape character parity
009C	156	Byte-received flag
009D	157	Direct=$80/RUN=0 output control
009E	158	Tp Pass 1 error log/char buffer
009F	159	Tp Pass 2 err log corrected
00A0-00A2	160-162	Jiffy Clock HML
00A3	163	Serial bit count/EOI flag
00A4	164	Cycle count
00A5	165	Countdown,tape write/bit count
00A6	166	Tape buffer pointer
00A7	167	Tp Wrt ldr count/Rd pass/inbit
00A8	168	Tp Wrt new byte/Rd error/inbit cnt
00A9	169	Wrt start bit/Rd bit err/stbit
00AA	170	Tp Scan;Cnt;Ld;End/byte assy
00AB	171	Wr lead length/Rd checksum/parity
00AC-00AD	172-173	Pointer: tape bufr, scrolling
00AE-00AF	174-175	Tape end adds/End of program
00B0-00B1	176-177	Tape timing constants
00B2-00B3	178-179	Pntr: start of tape buffer
00B4	180	1=Tp timer enabled; bit count
00B5	181	Tp EOT/RS232 next bit to send
00B6	182	Read character error/outbyte buf
00B7	183	# characters in file name
00B8	184	Current logical file
00B9	185	Current secndy address
00BA	186	Current device
00BB-00BC	187-188	Pointer to file name
00BD	189	Wr shift word/Rd input char
00BE	190	# blocks remaining to Wr/Rd
00BF	191	Serial word buffer
00C0	192	Tape motor interlock
00C1-00C2	193-194	I/O start address
00C3-00C4	195-196	Kernel setup pointer
00C5	197	Last key pressed
00C6	198	# chars in keybd buffer
00C7	199	Screen reverse flag
00C8	200	End-of-line for input pointer
00C9-00CA	201-202	Input cursor log (row, column)
00CB	203	Which key: 64 if no key
00CC	204	0=flash cursor
00CD	205	Cursor timing countdown

```
00CE          206         Character under cursor
00CF          207         Cursor in blink phase
00D0          208         Input from screen/from keyboard
00D1-00D2     209-210     Pointer to screen line
00D3          211         Position of cursor on above line
00D4          212         0=direct cursor, else programmed
00D5          213         Current screen line length
00D6          214         Row where curosr lives
00D7          215         Last inkey/checksum/buffer
00D8          216         # of INSERTs outstanding
00D9-00F2     217-242     Screen line link table
00F3-00F4     243-244     Screen color pointer
00F5-00F6     245-246     Keyboard pointer
00F7-00F8     247-248     RS-232 Rcv pntr
00F9-00FA     249-250     RS-232 Tx pntr
00FF-010A     256-266     Floating to ASCII work area
0100-103E     256-318     Tape error log
0100-01FF     256-511     Processor stack area
0200-0258     512-600     Basic input buffer
0259-0262     601-610     Logical file table
0263-026C     611-620     Device # table
026D-0276     621-630     Sec Adds table
0277-0280     631-640     Keybd buffer
0281-0282     641-642     Start of Basic Memory
0283-0284     643-644     Top of Basic Memory
0285          645         Serial bus timeout flag
0286          646         Current color code
0287          647         Color under cursor
0288          648         Screen memory page
0289          649         Max size of keybd buffer
028A          650         Repeat all keys
028B          651         Repeat speed counter
028C          652         Repeat delay counter
028D          653         Keyboard Shift/Control flag
028E          654         Last shift pattern
028F-0290     655-656     Keyboard table setup pointer
0291          657         Keyboard shift mode
0292          658         0=scroll enable
0293          659         RS-232 control reg
0294          660         RS-232 command reg
0295-0296     661-662     Bit timing
0297          663         RS-232 status
0298          664         # bits to send
0299-029A     665         RS-232 speed/code
029B          667         RS232 receive pointer
029C          668         RS232 input pointer
029D          669         RS232 transmit pointer
029E          670         RS232 output pointer
029F-02A0     671-672     IRQ save during tape I/O
02A1          673         CIA 2 (NMI) Interrupt Control
02A2          674         CIA 1 Timer A control log
02A3          675         CIA 1 Interrupt Log
02A4          676         CIA 1 Timer A enabled flag
02A5          677         Screen row marker
02C0-02FE     704-766     (Sprite 11)
0300-0301     768-769     Error message link
0302-0303     770-771     Basic warm start link
0304-0305     772-773     Crunch Basic tokens link
0306-0307     774-775     Print tokens link
0308-0309     776-777     Start new Basic code link
030A-030B     778-779     Get arithmetic element link
030C          780         SYS A reg save
030D          781         SYS X-reg save
030E          782         SYS Y-reg save
030F          783         SYS status reg save
0310-0312     784-785     USR function jump          (B248)
0314-0315     788-789     Hardware interrupt vector  (EA31)
0316-0317     790-791     Break interrupt vector     (FE66)
0318-0319     792-793     NMI interrupt vector       (FE47)
031A-031B     794-795     OPEN vector                (F34A)
031C-031D     796-797     CLOSE vector               (F291)
031E-031F     798-799     Set-input vector           (F20E)
0320-0321     800-801     Set-output vector          (F250)
0322-0323     802-803     Restore I/O vector         (F333)
0324-0325     804-805     INPUT vector               (F157)
0326-0327     806-807     Output vector              (F1CA)
0328-0329     808-809     Test-STOP vector           (F6ED)
032A-032B     810-811     GET vector                 (F13E)
032C-032D     812-813     Abort I/O vector           (F32F)
032E-032F     814-815     Warm start vector          (FE66)
0330-0331     816-817     LOAD link                  (F4A5)
0332-0333     818-819     SAVE link                  (F5ED)
033C-03FB     828-1019    Cassette buffer
0340-037E     832-894     (Sprite 13)
0380-03BE     896-958     (Sprite 14)
03C0-03FE     960-1022    (Sprite 15)
0400-07FF    1024-2047    Screen memory
0800-9FFF    2048-40959   Basic ROM memory
8000-9FFF   32768-40959   Alternate:  ROM plug-in area
A000-BFFF   40960-49151   ROM:  Basic
A000-BFFF   49060-59151   Alternate:  RAM
C000-CFFF   49152-53247   RAM memory, including alternate
D000-D02E   53248-53294   Video Chip (6566)
D400-D41C   54272-54300   Sound Chip (6581 SID)
D800-DBFF   55296-56319   Color nybble memory
DC00-DC0F   56320-56335   Interface chip 1, IRQ (6526 CIA)
DD00-DD0F   56576-56591   Interface chip 2, NMI (6526 CIA)
D000-DFFF   53248-53294   Alternate:  Character set
E000-FFFF   57344-65535   ROM:  Operating System
E000-FFFF   57344-65535   Alternate:  RAM
FF81-FFF5   65409-65525   Jump Table, Including:
  FFC6 - Set Input channel
  FFC9 - Set Output channel
  FFCC - Restore default I/O channels
  FFCF - INPUT
  FFD2 - PRINT
  FFE1 - Test Stop key
  FFE4 - GET
```

Some Machine Code Routines Explained

Peter Gabor

Quite a lot has already been written about methods of transferring the screen of your CBM to the Printer. A BASIC program has already been published in ''The Best of CPUCN'', but since reading of the screen and translating it into the correct characters for the Printer involves a lot of string-manipulation, this program was rather on the slow side.

A much faster version (in Machine Code, for BASIC 2.0) appeared on page 25 of the July 1981 issue of the Commodore Club News. This is a very useful utility; it can sit undisturbed in the second cassette buffer and hitting the '\' key transfers the screen to the printer at full speed.

I think, that it is not really enough to type in a program and run it. It is much more fun to try and understand as much of it as possible, because that will let us ''play around'' with it. The BASIC 4.0 version also appeared in a later issue, but without comments. Here are some details, that might be useful to know.

First, let us reproduce the BASIC 4.0 version of the program:—

```
.: 0338 AA AA 78 A9 03 85 91 A9
.: 0340 45 85 90 58 60 A5 97 C9
.: 0348 45 D0 03 20 51 03 4C 55
.: 0350 E4 A9 80 85 20 A9 00 85
.: 0358 1F A9 04 85 B0 85 D4 20
.: 0360 D5 F0 20 48 F1 A9 19 85
.: 0368 22 A9 0D 85 21 20 D2 FF
.: 0370 A9 11 AE 4C E8 E0 0C D0
.: 0378 02 A9 91 20 D2 FF A0 00
.: 0380 B1 1F 29 7F AA B1 1F 45
.: 0388 21 10 0B B1 1F 85 21 29
.: 0390 80 49 92 20 D2 FF 8A C9
.: 0398 20 B0 04 09 40 D0 0E C9
.: 03A0 40 90 0A C9 60 B0 04 09
.: 03A8 80 D0 02 49 C0 20 D2 FF
.: 03B0 C8 C0 28 90 CB A5 1F 69
.: 03B8 27 85 1F 90 02 E6 20 C6
.: 03C0 22 D0 A6 A9 0D 20 D2 FF
.: 03C8 4C CC FF AA AA AA AA AA
```

Another contribution from Peter Gabor, this time exploring a machine code routine for dumping the contents of the screen, and another article for adding two machine code programs together. Although both these routines have appeared before, Peter now presents a new and interesting look at both programs.

But watch it! Disk operations use part of the second casette buffer. That means, that with BASIC 4.0, this utility will definitely not ''sit undisturbed'' in its place. Actually, it should be loaded last, preferably from the program itself, where it is needed.

Now let's try to find out something about its working. The disassembled version starts with:—

```
033A 78        SEI
033B A9 03     LDA #$03
033D 85 91     STA $91
033F A9 45     LDA #$45
0341 85 90     STA $90
0343 58        CLI
0344 60        RTS
```

These lines change the IRQ Vector (the keyboard has to be checked for '\' during each interrupt). This is the ''activating'' routine, and has to be called with SYS 826. The IRQ Vector points now to $0345.

```
0345 A5 97     LDA $97
0347 C9 45     CMP #$45
0349 D0 03     BNE $034E
034B 20 51 03  JSR $0351
034E 4C 55 E4  JMP $E455
0351 A9 80     LDA #$80
0353 85 20     STA $20
0355 A9 00     LDA #$00
0357 85 1F     STA $1F
0359 A9 04     LDA #$04
035B 85 B0     STA $B0
```

```
035D 85 D4      STA $D4
035F 20 D5 F0   JSR $F0D5
0362 20 48 F1   JSR $F148
0365 A9 19      LDA #$19
0367 85 22      STA $22
0369 A9 0D      LDA #$0D
036B 85 21      STA $21
```

Here location $97 is checked. If it is found to contain the code for '\' (this location always has the code of the key depressed), the routine jumps to $034E, otherwise it continues the usual IRQ route.

Next, the starting address of the screen is set ($8000), and this is where the first opportunity to meddle around with the routine presents itself.

Let us say the top of the screen has a title we do not want to print.

Well all we have to do is to correct the starting address of the screen. Poke 40* number of lines into location 854 ($0356) and dumping starts at the nth line (nc7, naturally). Looking a bit further down, we find "LDA =$19". These are the number of lines to be dumped. Naturally, if we lower the top of the screen, we have to decrease this number accordingly. So: POKE 870, (25-n).

By the way, if you want to omit bottom of the screen, you can always poke the number of lines to be printed, without changing location $0356.

The next part of the routine converts screen characters to ASCII for the Printer, — we can leave this part alone. At the end we come to:—

```
03B0 C8         INY
03B1 C0 28      CPY #$28
03B3 90 CB      BCC $0380
03B5 A5 1F      LDA $1F
03B7 69 27      ADC #$27
03B9 85 1F      STA $1F
03BB 90 02      BCC $03BF
03BD E6 20      INC $20
03BF C6 22      DEC $22
03C1 D0 A6      BNE $0369
03C3 A9 0D      LDA #$0D
03C5 20 D2 FF   JSR $FFD2
03C8 4C CC FF   JMP $FFCC
```

"Y" obviously counts the number of characters printed in a line, and if the line is finished, line length-1 added with carry to the screen-address

($1f). (''Why line length-1?'' — I hear you ask. Well, the Carry bit was set during the CPY operation three lines higher. Since the Carry bit is also added, we set the full line length.) POKE-ing 80 and 79 respectively into locations 946 ($03B2) and 952 ($03B3) will print lines 80 characters long. Checking number of lines printed, printing a last carriage return and jumping to warm start concludes the routine.

Incidentally, it concludes this article as well.

DOS — REP — MIX

One of the most useful Utility Programs for the Disk Drive is the ''Universal Wedge'' also known as 'Dos Support''. It makes all disk handling and program loading very easy. Another one is ''Repeat'' (The Pet Revealed, page 132). It is absolutely essential for fast editing.

Since both programs are in constant use, I decided to make a composite for convenience. Naturally, a few problems had to be resolved:—

1) The second casette buffer should remain free for all those little routines, that appear in the ''Newsletter''. Therefore the routine had to be relocated to sit in the first casette buffer.

2) A command had to be provided for turning the repeat function off. The Pet runs faster without Repeat, and with the ''Repeat'' activated some commands such as ''DLOAD'' do not work properly.

3) Having a notoriously bad memory, I wanted to display the proper 'SYS' command(s) every time the program is loaded.

I came up with the following (BASIC4 Version):—

```
.:  0278 20 ff ff 78 a9 8a 85 90
.:  0280 a9 02 85 91 a9 01 85 02
.:  0288 58 60 a5 97 ea ea ea ea
.:  0290 ea ea ea ea ea ea ea ea
.:  0298 ea ea ea ea ea ea ea ea
.:  02a0 ea ea ea ea ea c5 00 f0
.:  02a8 09 85 00 a9 10 85 01 4c
.:  02b0 55 e4 c9 ff f0 f9 a5 01
.:  02b8 f0 04 c6 01 d0 f1 c6 02
.:  02c0 d0 ed a9 04 85 02 a9 00
.:  02c8 85 97 a9 02 85 a8 d0 df
.:  02d0 78 a9 55 85 90 a9 e4 85
.:  02d8 91 58 60 ff ff ff ff ff
```

The "Repeat" function is activated by 'SYS635' and deactivated by 'SYS720'.

The train of "ea"/s (NoOp; $028C to $02A5) is for those, who like to fool around with the interrupt routine. It is easy, for example, to change the display mode without having to POKE something or other (I forgot the exact numbers). Just put

C9 07 D0 05 A2 0C 8E 4C E8 C9 0E D0 03 8D 4C E8

into locations $028C to $029B and the square brackets ([,]) will take care of changing Graphics to Lower Case and vice versa.

Another possibility is to use the 'STOP' key to deactivate Repeat instead of SYS720. Write following sequence into locations $029C to $02A2:—

C9 04 D0 05 20 D0 02

The completed program looks now as follows:—

```
.:  0278 ff ff ff 78 a9 8a 85 90
.:  0280 a9 02 85 91 a9 01 85 02
.:  0288 58 60 a5 97 c9 07 d0 05
.:  0290 a2 0c 8e 4c e8 c9 0e d0
.:  0298 03 8d 4c e8 c9 04 d0 05
.:  02a0 20 d0 02 ea ea c5 00 f0
.:  02a8 09 85 00 a9 10 85 01 4c
.:  02b0 55 e4 c9 ff f0 f9 a5 01
.:  02b8 f0 04 c6 01 d0 f1 c6 02
.:  02c0 d0 ed a9 04 85 02 a9 00
.:  02c8 85 97 a9 02 85 a8 d0 df
.:  02d0 78 a9 55 85 90 a9 e4 85
.:  02d8 91 58 60 ff ff ff ff ff     (BASIC4 ve[illegible]on)
```

Now for the actual merging of "DOS" with "Repeat":—

If you have the "Universal Wedge" Program, that works for both BASIC2 & 4, then load the program, but DO NOT RUN IT. Enter the Repeat program with TIM (type SYS4, .M 0278 02D8, etc). Now exit from the Monitor and list your program. You should get:

```
 5 A=12*16↑3:REM $C000
10 IFPEEK(A)<>76THENSYS1639:REM BASIC2
15 IFPEEK(A)=76THENSYS2151:REM BASIC4
20 PRINT"[CLR][DWN][DWN][DWN][DWN][DWN][DWN][DWN][DWN][DWN]
    [DWN][DWN][DWN]      UNIVERSAL DOS SUPPORT LOADED[DWN][DWN]
    [DWN][DWN][DWN][DWN][DWN][DWN]"
30 NEW
READY.
```

```
 5 A=12*16↑3
 10 IFPEEK(A)<>76THENSYS1639:POKE684,46:POKE685,230:POKE722,46:
    POKE726,230
 15 IFPEEK(A)=76THENSYS2151:REM BASIC4
 20 PRINT"[CLR][DWN][DWN][DWN][DWN][DWN][DWN][DWN][DWN]
     [DWN]     UNIVERSAL DOS SUPPORT LOADED[DWN][DWN]"
 30 PRINT"     ACTIVATE REPEAT WITH SYS635[DWN]"
 40 PRINT"     DEACTIVATE REP. WITH [RVS]STOP[RVSO][DWN]
     [DWN][DWN][DWN][DWN]"
 50 NEW
READY.
```

The Machine Language Loader for the wedge program is located from $0500 to $08AD. Editing the Basic program will displace the loader upwards. To relocate it into its original position, enter the following commands in direct mode:

```
FOR K=1 TO 120: IF PEEK(1280+K)<>234 THEN NEXT        (return)
FOR J=1280 TO 2225: POKEJ,PEEK(J+K): NEXT             (return)
```

Now enter the monitor (SYS4) and save the program with the command:

.S "O: DOS-REP-MIX ",08,027A,08AF

Exit from the Monitor, type 'RUN' and you are in business!

For those, who have BASIC2 with the old version of DOS (displaying all the instructions on the screen), I should suggest the following procedure:

1. Enter the 'Repeat' program, taking care to change following bytes:

Location	Contents	Change to
$02B0	#$55	#$2E
$02B1	#$E4	#$E6
$02D2	#$55	#$2E
$02D6	#$E4	#$E6

2. Load the DOS program, but do not run it.

3. If you want to keep the original display of the instructions, then disregard next paragraph, and continue with para.5.

4. You might wish to include instructions for 'Repeat'. In this case list lines 250 to 260:

```
 250 PRINT"  SPECIAL COMMANDS START IN COL 1 AND
 260 PRINT"ARE FOLLOWED BY A 2040 FILENAME.
READY.
```

and change them using the editor to:

```
 250 PRINT"[DWN]    SYS635    ACTIVATE REPEAT    "
 260 PRINT"     [RVS]STOP[RVSO]    DEACTIVATE REPEAT  "
READY.
```

Be careful with the number of spaces at the end of each line! They are included to keep the length of the BASIC program constant. To check this, peek locations 1792 & 1793. You should get 234 & 230 respectively.

4. Save the program with the Monitor (.S "O: DOS-REP-MIX ",08,027A,0900).

In conclusion, I believe you will find that the time spent for entering this utility is very well compensated for by the pleasure you will have by using it.

```
LINE# LOC   CODE        LINE

0001  0000               ;**********************
0002  0000               ;*
0003  0000               ;*  REPEAT KEY
0004  0000               ;*
0005  0000               ;*   6/10/79
0006  0000               ;**********************
0007  0000               REPDEL=$02
0008  0000               DELAY  =$01
0009  0000               KEY    =$00
0010  0000               IRQSUB =$E62E
0011  0000               IRQV=$90
0012  0000               LSTKEY=$97
0013  0000               BLINK=$A8
0014  0000               BEGIN  =$340
0015  0000                      *=BEGIN
0016  0340               ;        .
0017  0340               ;REPEAT KEY ENABLE
0018  0340               ;
0019  0340  78            REPON  SEI
0020  0341  A9 4F                LDA #<REPEAT
0021  0343  85 90                STA IRQV
0022  0345  A9 03                LDA #>REPEAT
0023  0347  85 91                STA IRQV+1
0024  0349  A9 01                LDA #1
0025  034B  85 02                STA REPDEL
0026  034D  58                   CLI
0027  034E  60                   RTS
0028  034F               ;
0029  034F               ;REPEAT KEY FUNCTION
0030  034F               ;
0031  034F  A5 97         REPEAT LDA LSTKEY
0032  0351  C5 00                CMP KEY
0033  0353  F0 09                BEQ REP1
0034  0355  85 00                STA KEY
0035  0357  A9 10                LDA #$10
0036  0359  85 01                STA DELAY
0037  035B  4C 2E E6    REPEND JMP IRQSUB
0038  035E  C9 FF       REP1   CMP #$FF
0039  0360  F0 F9                BEQ REPEND
0040  0362  A5 01                LDA DELAY
0041  0364  F0 04                BEQ REP2
0042  0366  C6 01                DEC DELAY
0043  0368  D0 F1                BNE REPEND
0044  036A  C6 02       REP2   DEC REPDEL
0045  036C  D0 ED                BNE REPEND
0046  036E  A9 04                LDA #$04
0047  0370  85 02                STA REPDEL
0048  0372  A9 00                LDA #$00
0049  0374  85 97                STA LSTKEY
0050  0376  A9 02                LDA #$02
0051  0378  85 A8                STA BLINK
0052  037A  D0 DF                BNE REPEND
0053  037C                       .END
```

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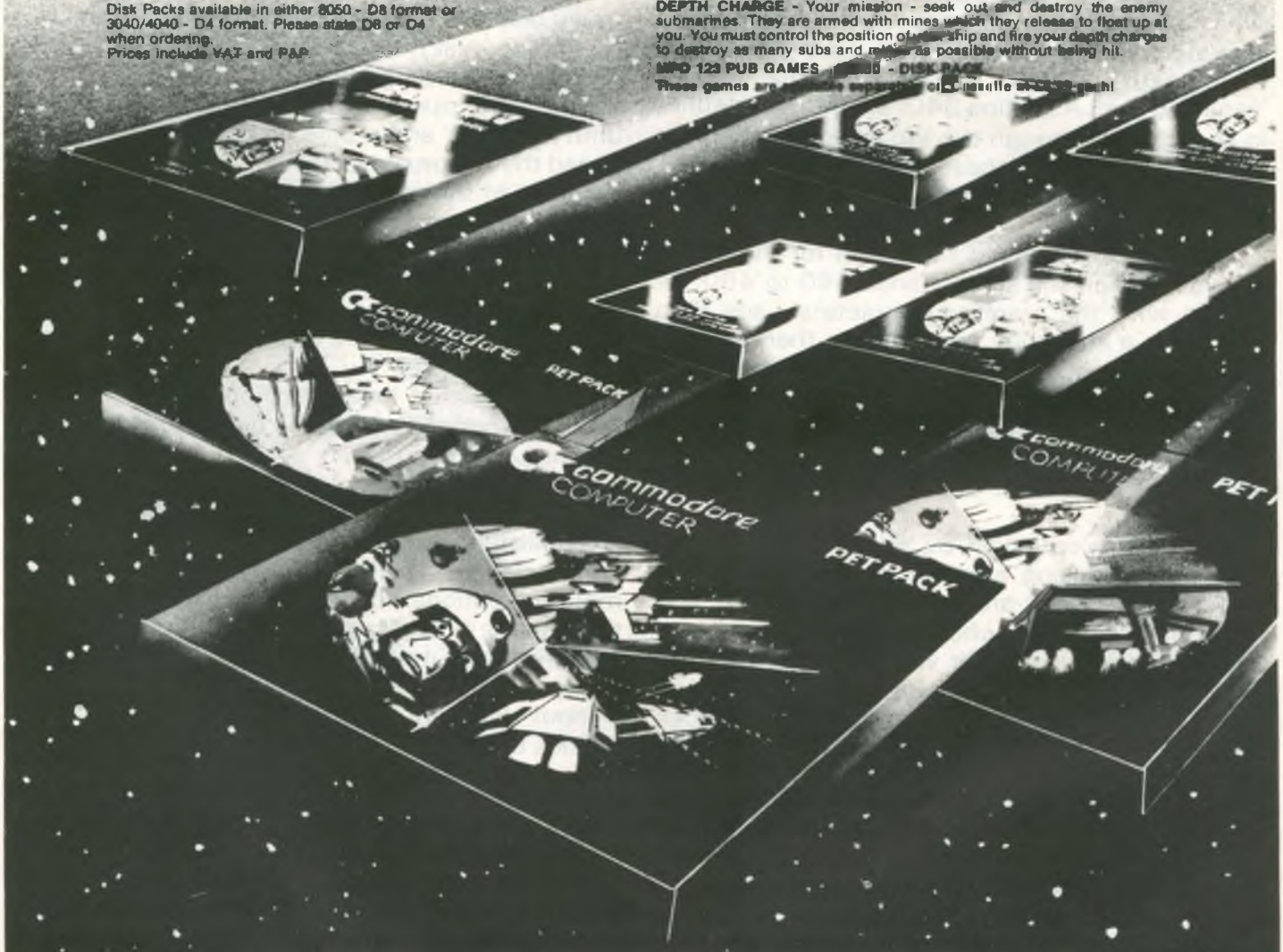

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Ten Basic Programs for Pets and Vics

There are too many authors here to be mentioned individually. Thanks to one and all

A couple of games for the unexpanded Vic 20 first.

Boss is a game of strategy and skill, and you'll find the instructions for playing in lines 510 to 630 of the program listing. Nicely REMmed throughout, you should have no problems figuring out how this one works.

Riverboat is an adaption of a well-known game, which has you steering a boat down a river, trying to watch out for rocks and oil slicks: a concession to modern pollution here! Note the use of variables like LAST (line 340) and MILES) defined in line 280). Although the Vic will only recognise the first 2 letters of these variable names, it will make for a more readable listing in your own programs.

Musical Cats is just a bit of fun for the Vic! It draws a cat on the screen (lines 340 to 460: be careful with the graphics characters), and then just plays a little tune while it's up there.

Continuing our games theme, we now have two that will work on anything other than a Vic, and for 80 column users I suggest you PRINT CHR$(142) before playing to get the best effect, and PRINT CHR$(14) afterwards to get back to normal again.

Arrow, with optional CB2 sound if you want it, has you controlling a snake moving around the screen (instructions are in lines 120 to 160), and incidentally uses the whole screen on an 80 column Pet. You have to hit various boxes to score points. All this sounds fairly easy, but unfortunately the snake gets longer as the game goes on, and you have to avoid not only bumping into the walls, but also into yourself!

Android Nim is an old favourite that's been around for as long as any of us Pet users can remember, and quite a lot of you will probably have copies of it already, but for the benefit of those of you who don't, well here it is! Based on and old game of Nim, but with Androids shooting other Droids instead of you picking matches up, this is one of the most elegant pieces of coding you're ever likely to see in Basic. Hilarious to watch in action (each droid moves frantically about, and the droids in command all speak to you via CB2 in their own little voices), the program actually displays intelligence (IQ defined in line 35) by getting ever more difficult to beat. Well worth the effort of typing it in.

The last of our games requires a Basic 4 40 column machine, and a little bit of machine code to speed the action up. You'll find the instructions at the start of the game (lines 190 to 550), and the game is a fascinating test of your skill and logic. You won't solve the puzzle easily!

Our next program, Tables, shows just what can be done by junior programmers these days! Heavily REMmed so that you can find your way about, this was written by a ten year old, Emma Bowdrey, with a little bit of polishing up by her father, although I'm sure he didn't contribute too much.

It is an educational program, which came about because of the poor quality of similar commercially available programs. It is a test of your knowledge of your times table, and with ever more educational reports coming out suggesting that a large percentage of our youngsters cannot perform simle multiplication, should find a use in many a home or school.

Input program is the first of our business utilities this month, and will only run on an 80 column Pet. Although the number of data statements in the program GAPINPUT may look daunting, persevere, and you will have a most useful alternative to Commodore's old standard data entry environment, which was never very flexible at the best of times. If enough of you write in we might print the source code, but I'm not taking a risk with 17 sheets of A4 to be printed!

The demo program should give you an insight into how it all works when in action, but the data statements in lines 100 to 106 need a little bit of

D. Milnes, is another one of our regular contributors, and is another northerner, from Batley, West Yorkshire. What's happened to all you southerners then?! In this month's article he shows how to autoload programs with a mixture of basic and machine code.

explanation. The syntax for using this routine is in line 30, and consist of SYS 1444,X,Y,L,U,V,J,Z$,A$. These have the following meanings:

Z is the X co-ordinate of the first position in the field.
Y is the Y co-ordinate of the first position in the field.
L is the length of the field between delimeters
U is the lowest ASCII value of any key acceptable in the input
V is the highest value acceptable
J is the type of variable a = string, 0-8 = no. of decimal points)
Z$ is the string to be printed in the input field.
A$ is the string in which new data will return.

From that you should be able to fathom out the data statements, which are presented in the order Z$, X,Y,L,U,V,J. Having done that, adapting this to your own programs should pose no problems.

Lengthcheck is a straightforward disk utility for a Basic 4.0 machine hooked up to a disk drive, which returns the record length of any relative file.

Disk Utility is a mite more complex, since it performs three separate functions. It too requires Basic 4.0, but will work with any disk drive. The three functions are to be found in lines 170 to 250, 740 to 790, and 1360 to 1390, and will come in useful when checking what is on the disk, where it is, and whether it's what you wanted to go there in the first place!

BOSS : VIC 20

```
10 REM BOSS PUZZLE
20 REM DAVID PARKINSON
30 REM 1ST JAN 1982
35 REM
40 GOTO 500
45 REM PAUSE
46 REM
50 FORX=1TO1000:NEXT:RETURN
95 REM DRAW SQUARE AT COORDINATES P,Q
96 REM
100 N=S(P,Q):PRINT"█";LEFT$(R$,5+3*P);LEFT$(D$,4+3*Q);"█";MID$(CO$,N,1);
120 PRINT"   ████";N;"██";:IF N<10THEN PRINT" ";
130 PRINT"████   ";:RETURN
495 REM INSTRUCTIONS
496 REM
500 C5=36869:POKE C5,PEEK(C5)OR2:POKE 36879,27
510 PRINT"██BOSS PUZZLE"
520 PRINT"██YOU WILL BE SHOWN A 4"
530 PRINT"BY 4 MATRIX OF SQUARES";
540 PRINT"NUMBERED 1 TO 15, WITH";
550 PRINT"ONE SQUARE MISSING."
560 PRINT"█THE COMPUTER WILL THEN";
570 PRINT"SHUFFLE THE SQUARES"
580 PRINT"RANDOMLY."
590 PRINT"█THE OBJECT IS TO SLIDE";
600 PRINT"THE SQUARES BACK INTO"
610 PRINT"THEIR ORIGINAL ORDER"
620 PRINT"USING THE FUNCTION"
630 PRINT"KEYS."
640 PRINT"███PRESS █RETURN█ TO START";:POKE 198,0
650 GET A$:IF A$<>CHR$(13) THEN 650
995 REM SET UP VARIABLES ETC
996 REM
999 SB=36879:V0=36878:S1=36874:S3=36876
1000 POKE SB,26:POKE V0,5:DEF FNR(X)=INT(X*RND(1)):DIM S(3,3):CO$="████████
█"
1001 F1$=CHR$(133):F3$=CHR$(134):F5$=CHR$(135):F7$=CHR$(136)
1002 D$="██████████████████████████":R$="██████████████████████"
1003 REM DRAW BOARD
1004 REM
1005 PRINT"██ BOSS█████████┌──────────┐"
1006 FOR X=1 TO 12:PRINT"█████│          │":NEXT:PRINT"█████└──────────┘"
1007 PRINT"██PLEASE WAIT";
1008 REM FILL IN SQUARES
1009 REM
1010 N=0:FOR Q=0 TO 3:FOR P=0 TO 3:N=N+1:S(P,Q)=N:GOSUB 100:NEXT:NEXT
1011 FORY=1TO4:GOSUB50:NEXT
1015 REM SHUFFLE
1016 REM
1020 FOR X=1 TO 50:POKE S3,128*(1+.5*RND(1))
1030 P1=FNR(4):P2=FNR(4):Q1=FNR(4):Q2=FNR(4)
1040 IF P1=P2 AND Q1=Q2 OR S(P1,Q1)=16 OR S(P2,Q2)=16 THEN 1030
```

```
1050 T=S(P1,Q1):S(P1,Q1)=S(P2,Q2):S(P2,Q2)=T:P=P1:Q=Q1:GOSUB100:P=P2:Q=Q2:GOSUB
100
1060 NEXT:GOSUB50:POKE S3,0
1065 REM START PLAY
1066 REM
1068 P=3:Q=3:TI$="000000"
1070 PRINT"■";LEFT$(D$,19);"■  F1 = UP    F7=DOWN":PRINT"  F3 = RIGHT F5=LEFT"

1075 REM CHECK IF IN ORDER
1076 REM
1080 N=0:FL=-1:FOR X=0 TO 3:FOR Y=0 TO 3:N=N+1:IF S(Y,X)<>N THEN FL=0
1090 NEXT:NEXT:IF FL THEN 5000
1095 REM ACCEPT AND PERFORM MOVE
1096 REM
1100 POKE 198,0
1105 GETA$:IFA$<>"" THEN 1110
1106 PRINT"■■";TAB(7);LEFT$(TI$,2);" ";MID$(TI$,3,2);" ";RIGHT$(TI$,2);
1107 PRINT TAB(17);G;:GOTO 1105
1110 IF A$=F1$ AND Q<>3 THEN S(P,Q)=S(P,Q+1):GOSUB100:Q=Q+1:FX=250:GOTO1145
1120 IF A$=F7$ AND Q<>0 THEN S(P,Q)=S(P,Q-1):GOSUB100:Q=Q-1:FX=220:GOTO1145
1130 IF A$=F5$ AND P<>3 THEN S(P,Q)=S(P+1,Q):GOSUB100:P=P+1:FX=230:GOTO1145
1140 IF A$=F3$ AND P<>0 THEN S(P,Q)=S(P-1,Q):GOSUB100:P=P-1:FX=240:GOTO1145
1141 GOTO 1100
1145 POKE S3,FX:S(P,Q)=16:GOSUB100:G=G+1:POKE S3,0:GOTO 1080
4995 REM GIVE NASTY DISPLAY
4996 REM
5000 T1$=TI$:GOSUB50:FOR X=1TO100
5010 PRINT"■";LEFT$(D$,22*RND(1));LEFT$(R$,21*RND(1));MID$(CO$,1+16*RND(1),1);"
_";
5020 IF RND(1)<.5 THEN PRINT"■";
5030 PRINT"DONE IT!";
5040 POKE SB,1+255*RND(1):POKE VO,1+X/10
5050 FOR Y=0TO2:POKE S1+Y,128*(1+RND(1)):NEXT:NEXT:POKE VO,15:POKE S1+3,220
5060 GOSUB50:GOSUB50:POKE SB,27:FORY=0TO4:POKE S1+Y,0:NEXT
5065 REM GIVE RESULT
5066 REM
5070 PRINT"■■IT TOOK YOU";G;"MOVES"
5075 PRINT"AND ";:A$=LEFT$(T1$,2):IF A$<>"00" THEN PRINT A$;" HOURS"
5076 PRINT MID$(T1$,3,2);" MINUTES":PRINT RIGHT$(T1$,2);" SECONDS."
5080 PRINT"■■ANOTHER GAME? ";:POKE 198,0
5090 GET A$:IF A$<>"Y" AND A$<>"N" THEN 5090
5100 IF A$="Y" THEN PRINT "YES":GOSUB 50:CLR:GOTO 999
5110 PRINT"NO":PRINT"■THANKS FOR PLAYING.":END
```

MUSICAL CATS : VIC 20

```
100 REM PET BENELUX
110 REM EXCHANGE
120 REM NETHERLANDS
130 VR=PEEK(648)*256
140 KR=38400:IFVR<>7680THENKR=37888
150 Q=VR+16*22+11
160 W=VR+12*22+14
170 E=36876
180 KL=36879
190 V=36878
200 POKEV,15
210 POKEKL,26
220 GOSUB340:GOTO250
230 READA:POKEE,G(A):FORX=0TO11:POKEQ,M(X):FORY=1TO8:NEXT:NEXT:POKEE,0:RETURN
240 FORX=0TO699:NEXT:RETURN
250 DIMM(11),G(12):FORX=0TO11:READM(X)
260 NEXT:FORX=0TO12:READG(X):NEXT:GOSUB240:POKEE,0
270 FORYY=0TO50:GOSUB230:NEXT:GOSUB240:GOSUB230:GOSUB230:GOSUB240
280 POKEW,192:GOSUB240
290 POKEW,209:GOSUB240:GOSUB240:POKEE,0:PRINT"■";:POKE36879,27:END
300 DATA247,248,98,121,111,100,111,121,98,248,247,227,167,175
310 DATA177,183,191,193,195,199,201,202,207,209,215,6,5,3,1,6,5,3,1,6,5,6,7,8,5
3
320 DATA1,8,5,3,1,8,5,3,1,8,7,8,9,10,6,3,1,3,5,6,3,1,6,11,10,0,0,1,1,2,2,3,3,5
330 DATA4,5,12,6,0,0
340 PRINT"■■   *** VIC MIAUW ***■■■■■"
```

```
350 PRINT"
360 PRINT"
370 PRINT"
380 PRINT"
390 PRINT"
400 PRINT"
410 PRINT"
420 PRINT"
430 PRINT"
440 PRINT"
450 PRINT"
460 RETURN
READY.
```

RIVERBOAT : VIC 20

```
100 REM PET BENELUX
110 REM EXCHANGE
120 REM NETHERLANDS
130 VR=PEEK(648)*256
140 KR=38400:IFVR<>7680THENKR=37888
150 PK=7680+296:POKE36879,25:POKE36869,240
160 PRINT"■■***** RIVER-BOAT *****
170 PRINT"■TAKE YOUR RIVER-
180 PRINT"■BOAT ALONG THE VIC.
190 PRINT"■STEER WITH + AND -"
200 PRINT"■          + = LEFT
210 PRINT"■          - = RIGHT
220 R$(1)="■          ■"
230 R$(2)="■H         H■"
240 R$(3)="■■          ■■"
250 L=5
260 KW=0
270 GOSUB640
280 MILES=0
290 FORX=1TO15:PRINTTAB(5)+R$(2):NEXTX
300 K=INT(RND(9)*3)-1
310 IFKW=KTHENGOTO340
320 IFKW=1THENL=L+1:GOTO340
330 IFKW<1ANDK=1THENL=L-1
340 LAST=INT(RND(9)*9)
350 FORX=1TOLAST
360 AA=PEEK(197)
370 IFAA=61THENPK=PK+1
380 IFAA=5THENPK=PK-1
390 POKEPK,209
400 IFPEEK(PK-1)=32ORPEEK(PK+1)=32THEN570
410 MILES=MILES+100-XX%
420 FORY=1TOXX%:NEXTY
430 L=L+K
440 POKEPK,160
450 IFL<1THENL=1:K=0
460 IFL>10THENL=11:K=0
470 IFRIGHT$(TI$,1)<>"0"THEN510
480 LL=4+ABS(K)
490 RP$=LEFT$(R$(K+2),LL)+"■■■■"+RIGHT$(R$(K+2),5)
500 GOTO520
510 RP$=R$(K+2)
520 PRINTTAB(L);:PRINTRP$
530 IFPEEK(PK)=102THEN790:REM OIL
540 NEXTX
550 KW=K
560 GOTO300
570 PRINT:PRINT"HIT A ROCK   !!!"
580 PRINT
590 GOSUB710
600 GETA$:IFA$=""THENGOTO600
610 IFA$="N"THEN930
620 IFA$<>"Y"THEN600
630 RUN
640 PRINT:PRINT:PRINT:PRINT:PRINT
650 PRINT"CHOOSE YOUR DIFFICULTY
660 PRINT"BETWEEN 10 AND 90 ";
```

```
670 INPUTXX%
680 IFXX%<10ORXX%>90THENPRINT"■■";:GOTO650
690 XX%=100-XX%
700 RETURN
710 FORX=1TO20
720 PRINT"■■SINKING!■■■■■■■■";:FORYY=1TO50:NEXT
730 PRINT"■SINKING!■■■■■■■■";:FORYY=1TO50:NEXT
740 NEXTX
750 PRINT:PRINT:PRINT"■YOU WENT";MILES/10000;"KM":PRINT"AT ";100-XX%;"KM/HR"
760 PRINT
770 PRINT:PRINT"ANOTHER GAME ?  Y/N";
780 RETURN
790 LAST=(22+K)*5:XS=22+K:PO=KR+(PK-VR)
800 FORX=0TOLASTSTEPXS
810 POKE(PO+X),0:POKE(PK+X),81
820 NEXTX
830 POKE(PO+X-1),0:POKE(PO+X+1),0
840 POKE(PK+X-1),42:POKE(PK+X+1),42
850 POKE(PO+X-21),0:POKE(PO+X-22),0
860 POKE(PK+X-21),42:POKE(PK+X-22),42
870 POKE(PO+X-23),0:POKE(PO+X+21),0
880 POKE(PK+X-23),42:POKE(PK+X+21),42
890 POKE(PO+X+22),0:POKE(PO+X+23),0
900 POKE(PK+X+22),42:POKE(PK+X+23),42
910 PRINT:PRINT"YOU'RE ABOUT TO DROWN!■
920 GOTO590
930 PRINT"■■";:POKE36879,27:END
READY.
```

ARROW : WORKS ON ANYTHING (EXCEOT VICS)!

```
100 PRINT"■■■ ARROW ■    JIM BUTTERFIELD"
110 INPUT"■INSTRUCTIONS";Z$:IFASC(Z$)=78GOTO190
120 PRINT"■GUIDE THE MOVING 'SNAKE' WITH KEYS:"
130 PRINT" 2(DOWN), 4(LEFT), 6(RIGHT), 8(UP)"
140 PRINT"■DON'T HIT THE BOUNDARY (OR YOURSELF);"
150 PRINT"..TRY TO HIT THE BOXES FOR POINTS."
160 PRINT"■YOU HAVE 60 SECONDS OF PLAY. GOOD LUCK!"
170 PRINT"■     ■HIT ANY KEY TO START"
180 GETZ$:IFZ$=""GOTO180
190 DIMP(255),D(3),V(8),H(8),T(8),R(8):K=.1
200 D(0)=22:D(1)=60:D(2)=62:D(3)=30
210 T9=32768:T6=3599:POKE59468,12
220 M1=59467:M2=59466:M3=59464
230 PRINT"■■   SCORE: 0":PRINT"A"
240 FORJ=0TO81:IFPEEK(T9+J)<>1THENNEXTJ
250 L=J:FORJ=T9+LTOT9+2*L-1:POKEJ,81:POKEJ+23*L,81:NEXTJ
260 FORJ=T9+2*LTOT9+24*LSTEPL:POKEJ,81:POKEJ+L-1,81:NEXT
270 V=5:H=5:V1=0:H1=1:P2=10:D1=2
280 TI$="000000"
290 PRINT"■";RIGHT$(TI$,2):IFTI>T6GOTO620
300 GETZ$:IFZ$=""GOTO330
310 Z=(ASC(Z$)-50)/2:IFZ<>INT(Z)ORZ<0ORZ>3GOTO330
320 D1=Z:D=Z-1.5:V1=INT(ABS(D))*SGN(D):H1=SGN(D)-V1
330 V=V-V1:H=H+H1:P=T9+V*L+H
350 P9=PEEK(P):POKEM1,16:POKEM3,29*D1+80:POKEM2,15
360 R6=R7:R7=R7+1:IFR7>P2THENR7=0
370 P1=P(R7):P(R7)=P:POKEM1,0:IFP1<>0THENPOKEP1,32
380 POKEP,D(D1):P1=P(R6):IFP1<>0THENPOKEP1,81
390 IFP9<>32GOTO540
400 IFRND(1)>KGOTO290
410 V%=RND(1)*L/10:P9=86+V%:V9=V(V%):IFV9>0GOTO591
470 V2=INT(RND(1)*20)+3:H2=INT(RND(1)*(L-4))+2
480 FORV3=V2-1TOV2+1:P3=V3*L+T9:FORH3=H2-1TOH2+1:IFPEEK(P3+H3)<>32GOTO470
490 NEXTH3,V3:V(V%)=V2:H(V%)=H2
500 FORV3=V2-1TOV2+1:P3=V3*L+T9:FORH3=H2-1TOH2+1
510 POKEM1,16:POKEM2,15:POKEM3,30
520 POKEP3+H3,P9:POKEM1,0
530 NEXTH3,V3:T=9*RND(1):P8=V2*L+H2+T9:POKEP8,49+T:T(V%)=T:R(V%)=P8:GOTO290
540 V%=P9-86:IFV%<0GOTO600
550 P8=R(V%):T=T(V%):P2=P2+T:T$=TI$
560 T=T-1:S=S+1:POKEP8,T+49:POKEM1,16:POKEM2,15
570 PRINT"■■■■■■■■■■";S
580 FORJ=100TO30STEP-1:POKEM3,J:NEXT:POKEM1,0:IFT>=0GOTO560
```

```
 590 P2=P2+1:TI$=T$:V9=V(V%)
 591 FORV3=V9-1TOV9+1:P3=V3*L+T9:H9=H(V%)+P3:FORH3=H9-1TOH9+1
 594 POKEH3,32:NEXTH3,V3:V(V%)=0:POKER(V%),32:GOTO290
 600 POKEM1,16:POKEM2,15:POKEM3,200:FORJ=1TO1000:NEXT:POKEM1,0
 620 PRINT"■■■ANOTHER GAME?■   ■■■";
 630 GETZ$:IFZ$=""GOTO630
 640 IFZ$="Y"THENCLR:GOTO190
 650 IFZ$<>"N"GOTO630
 660 PRINT"■";
READY.


ANDROID NIM : WORKS ON ANYTHING (EXCEPT VICS!)


 1 PRINT"■"TAB(10)"■■■■■ANDROID NIM■■■■"
 2 PRINTTAB(18)"■BY":PRINTTAB(14)"■DON DENIS■■■"
 3 PRINTTAB(11)"TORONTO, CANADA":PRINTTAB(13)"JULY, 1979":FORJ=1TO2E3:NEXT
 4 REM   153 UNDERHILL DR
 5 REM   DON MILLS, CANADA
 6 REM   M3A 2K6
 7 REM   (416)445-3927
 30 SF=64
 31 CL$="■                                                    ■"
 32 POKE59467,16
 33 LN=245:CN=226:KB=525
 34 IFPEEK(50003)THENLN=216:CN=198:KB=158
 35 DEF FNE(X)=(A(P)ORE)AND(NOT(A(P)ANDE)):IQ=.7
 36 DIM B$(18)
 38 : FORI=0TO17
 39 : READB$(I):NEXTI
 40 B$(18)="■■■ ■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ "
 41 B$(18)=B$(18)+"■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■"
 42 B$(18)=B$(18)+"■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■"
 43 B$(18)=B$(18)+"■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■"
 44 B$(18)=B$(18)+"■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■"
 50 DIM PX(17),PY(17),R(17),CM$(5),A(2),B(2)
 60 FORI=0TO17
 70 : READ PX(I),PY(I)
 75 : R(I)=I
 80 : NEXTI
 105 DIM M$(15)
 110 FORI=0TO15
 115 : READ M$(I)
 120 : NEXTI
 121 FORI=0TO5
 122 : READCM$(I)
 123 : NEXTI
 130 GOSUB2000
 146 IQ=.9
 150 RR=3:B(0)=10:B(1)=15:B(2)=18
 155 Q$="DO YOU NEED INSTRUCTIONS?":GOSUB800
 160 IFA$="N"GOTO200
 165 Q$="WE ARE THE EXECUTIONERS.\ PICK ONE OF US (A B OR C)\ TO DESTROY AS MAN
 166 Q$=Q$+"Y ANDROIDS\ FROM EACH ROW AS YOU WISH.\ THEN IT IS OUR TURN TO PLAY.
 167 Q$=Q$+"\ THE ONE WHO GETS THE LAST DROID WINS.":GOSUB1500
 200 PRINT"■":GOSUB2000:FOR N=3TO17
 205 : GOSUB1000
 210 : R(N)=N
 215 : NEXTN
 220 RR=18:A(0)=7:A(1)=5:A(2)=3
 225 TR=0:Q$="DO YOU WANT TO PLAY FIRST?":GOSUB800
 228 M=0
 230 IFA$="N"GOTO245
 235 IFA$<>"Y"GOTO225
 240 M=1-M
 245 IFRR=3GOTO500
 250 IFM=0GOTO400
 255 TR=0:Q$="IT IS YOUR TURN.\ WHICH ROW?":GOSUB800
 256 Z=1
 260 P=ASC(A$)-65
 265 IFP<0ORP>2THENGOSUB600:GOTO255
 270 IFA(P)=0THENGOSUB650:GOTO255
 275 TR=P:Q$="HOW MANY ANDROIDS?":GOSUB800
 280 Z=ASC(A$)-48
 285 IFZ<1ORZ>9THENGOSUB600:GOTO255
```

```
288 POKELN,PY(P):POKECN,PX(P):PRINT"T]▮"Z
290 IFZ>A(P)THENGOSUB650:POKELN,PY(P):POKECN,PX(P):PRINT"T]▮ ":GOTO275
300 SL=25:GOSUB700
305 POKELN,PY(P):POKECN,PX(P):PRINT"T]▮ "
310 GOTO240
400 E=0:F=0
405 FORP=0TO2
410 : E=FNE(0):IFA(P)>FTHENF=A(P):I1=P
415 : NEXTP
420 FORP=0TO2
425 : R=FNE(0):IFR<=A(P)GOTO470
430 : NEXTP:STOP
470 IFR=A(P)ORIQ>RND(1)THENP=I1:R=A(P)-INT(RND(1)*(A(P)-1)+1)
475 TR=P:Z=A(P)-R:Q$="WE CHOOSE"+STR$(Z)+" ANDROID FROM ROW "+CHR$(P+65)+".\"
476 GOSUB1500
478 SL=5:GOSUB700
495 GOTO240
500 Q$=" WIN.\":IFM<>0THENQ$=" LOSE.\"
505 Q$="YOU"+Q$
510 IFM=0THENQ$=Q$+" WE WILL PLAY BETTER NEXT TIME.\":IQ=IQ*IQ*IQ
515 TR=0:GOSUB1500
520 Q$="WOULD YOU LIKE ANOTHER GAME?":GOSUB800
525 IFA$<>"N"GOTO200
530 Q$="THANK YOU FOR PLAYING.\\":GOSUB1500:RUN
600 TR=0:R1=0:R2=0:R3=0:SL=17
605 M1$=M$(9):M2$=M$(10):M3$=M$(11)
610 GOSUB900
615 Q$="YOUR ANSWER DOES NOT MAKE SENSE.\"
616 IFZ=0THENQ$="CAN'T YOU MAKE UP YOUR MIND?\"
617 GOSUB1500
620 RETURN
650 R1=P:R2=P:R3=P:SL=25
655 M1$=M$(7):M2$=M$(8):M3$=M$(8)
660 GOSUB900
665 TR=P:Q$="SORRY, ONLY"+STR$(A(P))+" ANDROIDS LEFT.\"
670 IFA(P)=0THENQ$="I CAN'T DO IT. I HAVE NONE LEFT.\"
675 GOSUB1500
680 RETURN
700 R1=P:R2=P:R3=P
705 M1$=M$(6):M2$=M$(8):M3$=M$(8)
710 GOSUB900
712 II=B(P)-A(P)
715 FORI=IITOII+Z-1
720 : POKELN,PY(I):POKECN,PX(I):PRINT"]▮"B$(6)
725 : NEXTI
726 POKE59466,15
727 FORJJ=255TO30STEP-1:POKE59464,JJ:NEXTJJ:POKE59464,0
730 FORI=1TOZ
735 : GOSUB950
740 : NEXTI
788 RETURN
800 POKEKB,0:QU$=Q$:GOSUB1500
805 T=TI+800
810 M1$=M$(RND(1)*16)
815 M2$=M$(RND(1)*16)
820 M3$=M$(RND(1)*16)
825 R1=R(RND(1)*RR)
830 R2=R(RND(1)*RR):IFR2=R1GOTO830
835 R3=R(RND(1)*RR):IFR3=R2ORR3=R1GOTO835
840 SL=INT(25*RND(1)+1)
845 GOSUB900
850 GETA$:IFA$<>""THENPRINTCL$:RETURN
855 IFTI>TTHEN Q$=CM$(RND(1)*6)+"\ "+QU$:GOSUB1500:GOTO805
860 GOTO810
900 FORC=SL TO1STEP-1
910 : POKELN,PY(R1):POKECN,PX(R1):PRINT"]▮"B$(ASC(RIGHT$(M1$,C))-SF)
920 : POKELN,PY(R2):POKECN,PX(R2):PRINT"]▮"B$(ASC(RIGHT$(M2$,C))-SF)
930 : POKELN,PY(R3):POKECN,PX(R3):PRINT"]▮"B$(ASC(RIGHT$(M3$,C))-SF)
940 : NEXTC
945 RETURN
950 POKELN,PY(R1):POKECN,PX(R1):PRINT"]Q▮▮▮▮";
954 FORJJ=20TO140STEP7:POKE59464,JJ:NEXTJJ:POKE59464,0
955 SP=PX(R1):EP=PX(B(P)-A(P))-5
959 SP=PX(R1):EP=PX(B(P)-A(P))-5
960 FORJ=SPTOEPSTEP2:PRINT"  -=*▮▮▮▮";:NEXTJ
965 IFINT((EP-SP)/2)*2=EP-SPTHENPRINT"▮";
970 PRINT"]▮"B$(18)
974 RR=RR-1:A(P)=A(P)-1
```

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```
976 A=3
977 ONP+1GOTO990,985,980
980 A=A+A(1)
985 A=A+A(0)
990 FORJ=ATO16
991 : R(J)=R(J+1)
992 : NEXTJ
998 RETURN
1000 POKELN,PY(N):POKECN,PX(N):PRINT"█"B$(1+7*RND(1));
1010 POKELN,PY(N):POKECN,PX(N):PRINT"█"B$(0);
1020 POKELN,PY(N):POKECN,PX(N):PRINT"█"B$(9+5*RND(1));
1030 POKELN,PY(N):POKECN,PX(N):PRINT"█"B$(14+4*RND(1));
1040 RETURN
1500 PRINTCL$
1505 II=0:GOSUB1600
1510 FORI=1TOLEN(Q$)
1515 : CH$=MID$(Q$,I,1)
1517 N=N+1
1520 : IFCH$=" "THENGOSUB1600
1525 : IFCH$="\"THENII=I:FORJ=1TO600:NEXTJ:PRINTCL$:GOTO1550
1530 : POKELN,1:POKECN,I-II:PRINT"█"CH$
1550 : NEXTI
1560 RETURN
1600 POKELN,PY(TR):POKECN,PX(TR):PRINT"█"B$(1);
1605 POKE59466,45-TR
1610 PRINT"█████";:GOSUB1700
1615 PRINT"██";:GOSUB1700
1620 PRINT" █";:GOSUB1700
1625 PRINT" ";GOSUB1700
1630 N=0
1650 RETURN
1700 FORJJ=1TO3*RND(1):POKE59464,50*(3-TR+2*RND(1)):NEXTJJ
1710 POKE59464,0:RETURN
2000 FOR N=0TO2
2010 : GOSUB1000
2020 : PRINT"████"CHR$(N+65)
2030 : NEXTN:RETURN
5030 DATA"███████████████████████████IIIIII"
5035 DATA" ████████████"
5040 DATA" ████████████ "
5045 DATA" ████████████"
5050 DATA"████████████ "
5055 DATA" ████████████ "
5060 DATA"████████████ "
5065 DATA" ████████████ "
5070 DATA"████ ██"
5075 DATA"█████████ "
5080 DATA"█████████ "
5085 DATA"█████████ "
5090 DATA"█████████ "
5100 DATA"█████████ "
5105 DATA"█████████ "
5110 DATA"█████████ "
5115 DATA"█████████ "
5120 DATA"█████████ "
5230 DATA0,2,3,10,0,18,5,2,10,2,15,2,20,2,25,2,30,2,35,2,13,10,18,10,23,10,28
5240 DATA10,33,10,21,18,26,18,31,18
5330 DATA AHDEEIDABACABACABACAADHDAB
5335 DATA AHIDAFADAFADEIDHDAHAFFHFFAA
5340 DATA AHANCAAABKPLQAKPINHACCAFG
5345 DATA JOKPLQKPJOKPLQKPJOINFJHFM
5350 DATA FGNKLJLJLJLJLFHFFADEQNJNID
5355 DATA AHAFADAFAHADFDFDFDHDAFGKN
5360 DATA AHBBBAHADEEEDABACABACADEI
5365 DATA ABBIAHADEEEDAFADAFADAFAHA
5370 DATA OJJJPPPPQPQPKKKKKKKKKKKKK
5137 DATA AAAAAAAAAHABBBAAACCAHAAAHA
5380 DATA AAAAAAAAIIIIIJKLLLIIIIIII
5385 DATA AAAAAAAANIIIIOPQQQNNNNNNN
5390 DATA AHABADACAFABADACFBDCFBDHD
5395 DATA ADEIDADEIDADEIDHAFGFAFGFAFGF
5400 DATA BIBIDBIBIBACFMNCACACACAHCA
5405 DATA AFGGNQPQPQFAHDEPQNDAFGLIG
5510 DATACOME ON.,WE HAVEN'T GOT ALL DAY!
5520 DATAWE HAVE BETTER THINGS TO DO.
5530 DATAJUST ANSWER THE QUESTION.,IT ISN'T THAT DIFFICULT!
5540 DATATHERE IS A LIMIT TO OUR PATIENCE!
READY.
```

ELLIPTRICKS : BASIC 4, 40 COLUMN

```
100 REM ****************************
110 REM *  E L L I P T R I C K S   *
120 REM ****************************
130 :
140 PRINT"■■DO YOU NEED INSTRUCTIONS? (Y/N)"
150 GETA$:IFA$<>"Y"ANDA$<>"N"THEN150
160 IFA$="N"THEN2000
170 :
175 POKE59468,14
180 PRINT"■          ________________"
190 PRINT"          ■■ ELLIPTRICKS ■■"
200 PRINT"THIS GAME IS A SIMULATION, TAKING US TO
210 PRINT"THE ANCIENT CONTINENT OF ATLANTIS WHERE"
220 PRINT"ALL THE PEOPLE WERE HONEST AND THERE
230 PRINT"WERE NO JAILS. THEIR SCIENTISTS WERE
240 PRINT"FAMOUS IN MOST PARTS OF THE GALAXY AND
250 PRINT"ALL THE PEOPLE LED A HAPPY AND FULL
260 PRINT"LIFE.■
270 PRINT"ONE DAY, AN ALIEN SPACESHIP LANDED IN
280 PRINT"THE CITY OF RHU, CARRYING A SPY FROM
290 PRINT"ANOTHER PLANET. THE SPY WAS NATURALLY
300 PRINT"IMMEDIATELY CAUGHT, HIS EYES GAVE HIM
310 PRINT"AWAY (THEY WERE PURPLE, ALL THREE OF
320 PRINT"THEM) BUT THIS POSED A VERY BIG PROBLEM.";
330 PRINT"LOCKS WERE UNKNOWN IN ATLANTIS. SO HOW
340 PRINT"COULD ONE KEEP A SPY FROM RUNNING AWAY?"
350 PRINT"■ONE OF THE MOST POPULAR KINGS OF THE
360 PRINT"CONTINENT, WHO WAS ALSO A BRILLIANT
370 PRINT"SCIENTIST, CAME UP WITH THE SOLUTION.
380 GOSUB1900
390 PRINT"■■DURING ONE OF HIS EXPERIMENTS, IVAN THE
400 PRINT"FIRST DISCOVERED A METHOD OF JOINING
410 PRINT"LINKS IN A CHAIN USING THREE KIND OF
420 PRINT"GEOMETRICAL FORMS, FORGING THEM IN A
430 PRINT"FOUR-DIMENSIONAL WARP.
440 PRINT"■TWO SUCH CHAINS, HAVING 18 LINKS EACH
450 PRINT"AND PLACED ON EACH OTHER, WOULD MERGE
460 PRINT"AT ONCE, PRODUCING A DOUBLE CHAIN WITH
470 PRINT"ONLY 32 LINKS VISIBLE!!! THE OTHER FOUR
480 PRINT"WOULD ACT AS INVINCIBLE LOCKS IF THE
490 PRINT"ORIGINAL SEQUENCE OF THE LINKS WERE
500 PRINT"DISTURBED, MAKING IT IMPOSSIBLE FOR ANY
510 PRINT"MAN OR OBJECT, TRAPPED WITHIN THE INNER
520 PRINT"SQUARE TO ESCAPE.
530 PRINT"■EACH CHAIN COULD BE ROTATED IN ANY
540 PRINT"DIRECTION.■"
545 PRINT"ONLY RE-ESTABLISHING THE ORIGINAL"
550 PRINT"PATTERN COULD OPEN THIS TRAP."
560 GOSUB1900
570 POKE59468,12
580 PRINT"■THIS WAS ONE OF THE CHAINS:";
590 FORT=1TO1000:NEXT
600 SYS4940
610 FORT=1TO1500:NEXT
620 PRINT"■■.  - THE OTHER■"
630 PRINT"COMES ON            TOP OF IT:
640 FORT=1TO1000:NEXT
650 SYS4970
660 GOSUB1900
670 :
680 POKE59468,14
690 PRINT"■THE FOLLOWING KEYS CONTROL THE GAME: -"
700 PRINT"_____________________________________"
710 PRINT"■KEY         A  C  T  I  O  N          "
720 PRINT"■   "
730 PRINT"■ 6 ■  ROTATE HORIZONTAL CHAIN CLOCKWISE"
735 PRINT"■   "
740 PRINT"■ 4 ■  ROTATE HOR.CHAIN COUNTERCLOCKWISE
745 PRINT"■   "
750 PRINT"■ 8 ■  ROTATE VERTICAL CHAIN CLOCKWISE"
755 PRINT"■   "
760 PRINT"■ 2 ■  ROTATE VER.CHAIN COUNTERCLOCKWISE"
765 PRINT"■   "
770 PRINT"■ _ ■  RE-ESTABLISH ORIGINAL PATTERN"
```

```
775 PRINT"▯   "
780 PRINT"▯ ♥ ▬  START NEW GAME.▯"
790 PRINT"WHEN THE GAME STARTS, THE CHAINS WILL BE";
800 PRINT"ROTATED AT RANDOM. THE NUMBER OF MOVES"
810 PRINT"ARE COUNTED AND DISPLAYED ON THE SCREEN."
820 PRINT"WATCH THE RANDOM MOVES. MAYBE YOU CAN
830 PRINT"REPEAT THEM...."
840 PRINT"                    GOOD LUCK!!!"
850 GOSUB1900
860 GOTO2000
1890 :
1900 PRINT"▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯"
1910 PRINT"          ▯PRESS 'C' TO CONTINUE▯"
1920 GETA$:IFA$<>"C"THEN1920
1930 RETURN
1940 :
2000 PRINT"▯":POKE59468,12
2010 GOSUB2210:SYS4967:                    REM    DRAW CHAIN ON SCREEN
2020 FORT=1TO500:NEXT
2030 A=RND(-TI)
2040 FORA=5TO50*RND(1)+6
2050 B=2*INT(4*RND(1)+1)
2060 C$=MID$(STR$(B),2):GOSUB2130
2070 FORN=1TO50:NEXTN,A
2080 K=0
2090 GETC$:IFC$=""THEN2090
2100 GOSUB2130
2105 IFC$="S"THEN2010
2110 GOTO2090
2120 :
2130 IFC$="4"THENSYS4838:K=K+1
2140 IFC$="6"THENSYS4780:K=K+1
2150 IFC$="8"THENSYS4816:K=K+1
2160 IFC$="2"THENSYS4873:K=K+1
2170 IFC$="E"THENEND
2180 IFC$="R"THENSYS4967:PRINT"▯":GOSUB2210
2190 IFC$="S"THENPRINT"▯":RETURN
2200 PRINT"▯▯▯"LEFT$(STR$(K)+"     ",5):RETURN
2210 K=0
2220 PRINT"▯▯       ▯▮▮▮▮▮▮    ▯▮▮▮▮▮▮     "
2230 RETURN
READY.
```

```
?
.
.: 1200 46 81 20 81 22 81 24 81
.: 1208 26 81 28 81 2A 81 54 81
.: 1210 A5 81 F4 81 1A 82 18 82
.: 1218 16 82 14 82 12 82 10 82
.: 1220 E6 81 95 81 83 80 5D 80
.: 1228 87 80 D8 80 28 81 78 81
.: 1230 C8 81 18 82 68 82 B7 82
.: 1238 DD 82 B3 82 62 82 12 82
.: 1240 C2 81 72 81 22 81 D2 80
.: 1248 D8 18 A5 54 69 27 85 54
.: 1250 90 02 E6 55 60 A9 7B 81
.: 1258 54 20 48 12 A9 7C 81 54
.: 1260 E6 54 A9 7E 81 54 60 A9
.: 1268 49 81 54 20 48 12 A9 4A
.: 1270 81 54 E6 54 A9 4B 81 54
.: 1278 60 B1 21 85 54 C8 B1 21
.: 1280 85 55 A2 00 A1 54 85 57
.: 1288 A5 56 81 54 48 A5 57 85
.: 1290 56 E6 54 68 C9 6C F0 BD
.: 1298 90 CD A9 6E 81 54 20 48
.: 12A0 12 A9 6D 81 54 E6 54 A9
.: 12A8 7D 81 54 60 A9 00 85 21
.: 12B0 A9 12 85 22 20 1C 13 AD
.: 12B8 22 12 85 54 AD 23 12 85
.: 12C0 55 A2 00 A1 54 85 56 A0
.: 12C8 DC 20 79 12 C8 D0 FA 60
.: 12D0 A9 24 85 21 A9 12 85 22
.: 12D8 20 1C 13 AD 46 12 85 54
.: 12E0 AD 47 12 4C BF 12 A9 00
.: 12E8 85 21 A9 12 85 22 AD 00
.: 12F0 12 85 54 AD 01 12 85 55
.: 12F8 A2 00 A1 54 85 56 A0 22
.: 1300 20 79 12 88 88 88 10 F8
.: 1308 60 A9 24 85 21 A9 12 85
.: 1310 22 AD 24 12 85 54 AD 25
.: 1318 12 4C F6 12 38 A5 21 E9
.: 1320 DC 85 21 B0 02 C6 22 60
.: 1328 55 70 6C 70 6C 70 6C 55
.: 1330 6C 6C 55 6C 70 6C 70 6C
.: 1338 70 55 55 70 6C 70 6C 70
.: 1340 6C 55 6C 6C 55 6C 70 6C
.: 1348 70 6C 70 55 A0 23 A2 00
.: 1350 B9 00 12 85 55 88 B9 00
.: 1358 12 85 54 B9 28 13 81 54
.: 1360 88 10 ED 20 AC 12 60 20
.: 1368 4C 13 A0 23 A2 00 B9 24
.: 1370 12 85 55 B9 28 13 48 88
.: 1378 B9 24 12 85 54 68 81 54
.: 1380 88 10 EB 20 D0 12 20 09
.: 1388 13 60 4B 00 00 00 00 00
.: 1390 00 AA AA AA AA AA AA AA
.
READY.
```

Dear Mike,

Do you remember that I told you I suspected a lot of features on my "Miracle" program had been cribbed by 'Devious Designs', while they had it for appraisal?

Now the fantastic blonde that we had operating our accounts programs has just been appointed Sales Manager by "old smarty pants" in the old town. Guess what? You've got it . . . all our customers are getting quotes which, "by pure coincidence" are just a shade better than ours. Now we know what game she was playing in her lunch hour!

You mentioned a company that had produced a cheap Incription package, that only took a couple of seconds to protect a program. Can you give me their address and some idea of the price? I reliase that it's a bit like slamming the door when the horse has bolted, but at least it should prevent us going through any more episodes like this.

Yours

Pete

Dear Pete,

The trouble with you is that you think the world is full of nice people.

The company you want is Computer Allied Technology and the product is their Secure System, which you'll be pleasantly surprised to find is only £39.95.

Since I have bought mine, I have worked on the assumption that everything I have written may be *"of interest"* to someone else, and I protected the lot.

If anybody tries to mess with my software, all they will get for their troubles is a series of resets or a pile of useless garbage.

Regards

Mike

P.S. If you can't get a Secure from your local dealer then I suggest you drop Computer Applied Technology a line. Their address is:—
86 Cardigan Road, Bridlington, East Yorkshire.

TABLES : ANY PET!

```
100 REM          TABLES
110 REM
120 REM  BY MISS EMMA BOWDREY
130 REM
140 REM         AGE 10
150 REM
160 REM 'POLISHED' BY HER DAD.
170 REM
180 REM***********************************
185 REM SETTING UP
190 POKE59468,14:PRINT"■":DIMAN(12):DIMM(12)
200 CD$="■■■■■■■■■■■■■■■■■■■■■■■■■■■■"
205 REM OBTAIN TABLE NUMBER (N)
210 PRINT"■■■■■■","■■■HELLO!"
220 PRINT"■■■■■■■■PLEASE ENTER YOUR CHOICE OF TABLE    ■■■";
230 OPEN1,0:INPUT#1,N$:CLOSE1
235 N=VAL(N$)
240 IFN>1ANDN<13THEN GOTO260
250 PRINT:PRINT:PRINT"ONLY A TABLE FROM 2 TO 12 PLEASE!":GOTO 220
255 REM MASKING RANDOM SELECTION OF ANSWERS
260 MC=0:FORA=1TO12:AN(A)=(A+1)*N:M=INT(RND(TI)*13)
270 IFM>6 THENM(A)=1:MC=MC+1:GOTO290
280 M(A)=0
290 NEXT:IFMC<5THENGOTO260
295 REM TITLE DISPLAY
300 PRINT"■THE"N
310 PRINT"‾‾‾‾‾";:IFN>9THENPRINT"‾":GOTO330
320 PRINT
330 PRINT"TIMES"
340 PRINT"‾‾‾‾‾"
350 PRINT"TABLE"
360 PRINT"‾‾‾‾‾"
365 REM TABLE DISPLAY
370 IFN>9THEN430
380 PRINT"■","  1 X"N" ="N
390 FORA=1TO8:PRINT:PRINT,"";(A+1);"X";N" =";
400 IFM(A)=0THENPRINTAN(A):GOTO420
405 REM OTHERWISE DON'T SHOW ANSWER
410 PRINT
420 NEXT:GOTO480
430 PRINT"■","  1 X"N"="N
440 FORA=1TO8:PRINT:PRINT," ";(A+1);"X";N"=";
450 IFM(A)<>1THENPRINTAN(A):GOTO470
455 REM OTHERWISE DON'T SHOW ANSWER
460 PRINT
470 NEXT
480 IFN>9THEN530
490 FORA=9TO11:PRINT:PRINT,(A+1);"X";N" =";
500 IFM(A)<>1THENPRINTAN(A):GOTO520
505 REM OTHERWISE DON'T SHOW ANSWER
510 PRINT
520 NEXT:GOTO570
530 FORA=9TO11:PRINT:PRINT,(A+1);"X";N"=";
540 IFM(A)<>1THENPRINTAN(A):GOTO560
545 REM OTHERWISE DON'T SHOW ANSWER
550 PRINT
560 NEXT
565 REM ANSWER COLLECTING
570 RA=0:NP=0:WA=0
580 FORA=1TO11:MP=0
585 REM IS ANSWER MASK SET: 0 = YES
590 IFM(A)<>1THEN720
595 REM OTHERWISE OBTAIN AN ANSWER
600 NP=NP+1:CW=0
605 REM POSITION CURSOR IN POSITION OF  MISSING ANSWER
610 PRINTLEFT$(CD$,(A*2)+1);TAB(21);
615 REM CLEAR KEYBOARD BUFFER
620 FORCB=1TO10:GETL$:NEXT
630 OPEN2,0:INPUT#2,AN$:CLOSE2
640 PRINTLEFT$(CD$,(A*2)+1);TAB(26+MP);
650 AN=VAL(AN$)
655 REM MARK THE ANSWER
660 IFAN=AN(A)THENPRINTCHR$(250):RA=RA+1:GOTO720
670 CW=CW+1:WA=WA+1:PRINT"X":FORD=1TO960:NEXT
```

```
 680 IFCW<3THEN710
 690 PRINTLEFT$(CD$,(A*2)+1);TAB(20);" ■";RIGHT$(STR$(AN(A)),LEN(STR$(AN(A)))-1)

 700 PRINT"■ IS THE ANSWER.":GOTO720
 710 PRINTLEFT$(CD$,(A*2)+1);TAB(20);"      ■■■■■";:MP=MP+2:GOTO630
 720 NEXT
 725 REM CONTROLLED PAUSE TO REVEIW THE  EFFORTS
 730 PRINTCD$;"     PRESS 'SPACE' BAR TO CARRY ON!";
 740 GETK$:IFK$<>CHR$(32)THEN740
 745 REM REPORT
 750 PRINT"■"
 760 PR=(RA/(RA+WA))*100:IFPR<75THEN780
 770 PRINT"S";:FORA=1TO34:PRINT"O";:FORD=1TO10:NEXT:NEXT:PRINT"PER!"
 780 PRINT:PRINT"YOU GOT";RA;"RIGHT OUT OF";RA+WA;"TRIES"
 790 PRINT:PRINT"WORKING THROUGH THE";N;"TIMES TABLE."
 800 IFPR>74ANDRA>4THEN870
 810 IFRA<5ANDWA<2THENPRINT:PRINT"AS"RA"ANSWERS DIDN'T REALLY TEST YOU,":GOTO830
 820 PRINT:PRINT"NOT A HIGH MARK. YOU NEED MORE PRACTICE;■"
 830 PRINT:PRINT"WE WILL DO THE"N"TIMES TABLE AGAIN."
 840 PRINT:PRINT:PRINT"PRESS 'SPACE' BAR TO CARRY ON."
 850 GETK$:IFK$<>CHR$(32)THEN850
 860 GOTO260
 870 PRINT:PRINT:PRINT"DO YOU WANT TO:"
 880 PRINT:PRINT:PRINT"1. TRY THE"N+1"TIMES TABLE?"TAB(30)"(ENTER 1)"
 890 PRINT:PRINT"2. REPEAT THE"N"TIMES TABLE?"TAB(30)"(ENTER 2)"
 900 PRINT:PRINT"3. TRY ANOTHER TABLE?"TAB(30)"(ENTER 3)"
 910 PRINT:PRINT"4. STOP NOW?"TAB(30)"(ENTER 4)"
 920 PRINT:PRINT
 930 GETAN$:IFAN$=""THEN930
 940 IFAN$="1"THENPRINT"■":N=N+1:GOTO260
 950 IFAN$="2"THENPRINT"■":GOTO260
 960 IFAN$="3"THENPRINT"■":GOTO220
 970 IFAN$="4"THENPRINT:PRINT"SEE YOU AGAIN PERHAPS?   TOODLE-LOO!":END
 980 PRINT:PRINT"ONLY 1, 2, 3 OR 4 PLEASE!":GOTO930
READY.
```

MACHINE CODE TO DATA STATEMENTS : 8032

```
 60000 PRINT"■■CREATE DECIMAL DATA STMNTS FROM MCHCODE"
 60005 PRINT"■    *** CBM MODEL ■ 8032 ■ ONLY ***      "
 60010 INPUT"■■■■START LINE #   ■■■";S$:IFS$=" "THEN60010
 60020 INPUT"■■■■■■STEP   ■■■";T$:IFT$=" "THEN60020
 60030 INPUT"■■■■■■■■■START ADDRESS DECIMAL   ■■■";B$:IFB$=" "THEN60030
 60040 INPUT"■■■■■■■■■■■END ADDRESS DECIMAL   ■■■";E$:IFE$=" "THEN60040
 60050 S=VAL(S$):T=VAL(T$):B=VAL(B$):E=VAL(E$):F=B:L=F+18:PRINT"■■■■"
 60060 POKE831,INT(E/256)
 60070 POKE832,E-INT(E/256)*256
 60080 POKE828,T:GOTO60500
 60090 S=PEEK(826)*256+PEEK(827)
 60100 T=PEEK(828)
 60110 L=PEEK(829)*256+PEEK(830)
 60120 E=PEEK(831)*256+PEEK(832)
 60130 IFL>=EGOTO62000
 60140 F=L+1:L=L+18
 60150 PRINT"■                    "
 60500 PRINTS;
 60600 PRINT"DATA";
 60700 FORP=FTOL:PRINTMID$(STR$(PEEK(P)),2);",";:NEXTP
 60800 PRINT"■■ "
 60900 PRINT"GOTO60090■■■";
 61000 POKE158,2:POKE623,13:POKE624,13
 61100 S=S+T
 61200 POKE826,INT(S/256)
 61300 POKE827,S-INT(S/256)*256
 61400 POKE829,INT(L/256)
 61500 POKE830,L-INT(L/256)*256:END
 62000 STOP
READY.
```

LENGTHCHECK : BASIC 4, ANY DISK DRIVE

```
 140 REM ******************************
 150 REM *DISK UTILITY PROGRAM TO CHECK
 160 REM *RECORD LENGTH OF REL. FILE
 170 REM ******************************
```

```
 180 :
 190 PRINT"■":OPEN15,8,15:Z1$=CHR$(0)
 200 INPUT"ENTER NAME OF FILE";NM$:NM$=LEFT$(NM$+"                ",16)
 210 INPUT"■          DRIVE  ";D
 215 PRINT#15,"I";CHR$(D+48)
 220 OPEN4,8,4,"#":CH=4:T=39:S=1
 230 PRINT#15,"U1"CH;D;T;S:IFDS>19THENPRINTDS$:GOTO2000
 240 PRINT#15,"B-P"CH;0
 250 FORI=1TO2:GET#4,C1$:A(I)=ASC(C1$+Z1$):NEXT
 260 K=8:FORI=0TO7
 270 PRINT#15,"B-P"CH;5+I*32
 280 NN$="":FORJ=1TO16:GET#4,A$:NN$=NN$+A$:NEXT
 290 IFNN$=NM$THENK=I:I=7
 300 NEXT
 310 IFK=8ANDA(2)<255THENS=A(2):GOTO230
 320 IFK=8THENPRINT"FILE NOT FOUND":GOTO2000
 340 PRINT#15,"B-P"CH;2+K*32
 350 FORI=0TO2:GET#4,C1$:A(I)=ASC(C1$+Z1$):NEXT
 370 FT=A(0)-128
 380 IF FT<>4 THENPRINT"■THIS IS NOT A RELATIVE FILE!!": GOTO2000
 580 A1=A(1):A2=A(2)
 590 PRINT#15,"B-P"CH;21+K*32
 600 FORI=1TO3:GET#4,C1$:A(I)=ASC(C1$+Z1$):NEXT
 610 P$="RECORD SIZE IS"+STR$(A(3))+" BYTES"
 620 PRINT"■"P$:RL=A(3)
 2000 CLOSE1:CLOSE15:END
READY.
```

INPUT DEMO PROG : 8032

```
 1 REM* THE PROGRAM 'GAPINPUT' MUST BE LOADED & RUN BEFORE RUNNING THIS PRGM *
 2 REM
 10 POKE59468,12:POKE144,88:GOTO500
 20 X=X(I):Y=Y(I):L=L(I):U=U(I):V=V(I):J=J(I):Z$=B$(I)
 30 SYS31444,X,Y,L,U,V,J,Z$,A$:B$(I)=A$:RETURN
 100 DATA"■  SURNAME ■",12,5,24,32,90,9, "■ INITIALS ■",60,5,3,32,90,9
 102 DATA"■  ADDR-1  ■",12,7,20,32,90,9, "■  ADDR-2  ■",12,9,20,32,90,9
 104 DATA"■  ADDR-3  ■",12,11,20,32,90,9, "■  P/CODE  ■",12,13,4,48,57,9
 106 DATA"■ CRED/LIM  ■",1,16,9,48,57,2, "■  BALANCE  ■",20,16,9,48,57,2
 500 PRINT"■"TAB(34)"■ DATA ENTRY ■"
 510 RESTORE:FORI=1TO8:B$(I)="":READPR$(I),X(I),Y(I),L(I),U(I),V(I),J(I):NEXT
 520 PRINT"■■■■■"PR$(1)TAB(48)PR$(2)
 530 FORI=3TO7:PRINT:PRINTPR$(I):NEXT:PRINT"■"TAB(19)PR$(8)
 600 FORI=1TO8
 610 GOSUB20
 620 ONPEEK(0)GOTO700,650,700,650,640
 630 I=8:NEXT:GOTO800
 640 I=1:GOTO610
 650 IFI>1THENI=I-1:GOTO610
 660 GOTO610
 700 NEXT
 710 PRINT"■■■ ANY CHANGES? (Y/N)■"
 720 GETA$:IFA$="Y"THENPRINTCHR$(22):GOTO520
 730 IFA$<>"N"GOTO720
 800 PRINT"■■ DATA ENTERED■■":FORI=1TO8:PRINT:PRINTB$(I):NEXT
 900 POKE144,85
READY.
```

DATA ENTRY EDITOR (GAPINPUT) : 8032

```
 10 REM* GAP DATA ENTRY EDITOR - GA PEARCE - 111111 - JOHANNESBURG, S.AFRICA *
 90 POKE53,122:POKE52,212:CLR
```

```
95 FORI=31444TO32767:READJ:POKEI,J:NEXT
100 DATA32,105,125,162,49,141,122,2,201,1,144,40,201,78,176,36,32,105,125
105 DATA162,50,141,123,2,201,1,144,24,201,25,176,20,32,105,125,162,51
110 DATA141,124,2,201,1,144,8,24,109,122,2,201,80,144,3,76,146,127
115 DATA32,105,125,141,125,2,32,105,125,141,126,2,32,105,125,162,52,141
120 DATA127,2,201,9,240,22,176,227,24,105,2,205,124,2,240,2,176,217
125 DATA169,48,141,125,2,169,57,141,126,2,32,105,125,162,53,165,7,201
130 DATA255,208,196,32,124,125,32,160,125,32,182,125,32,124,125,32,228,126
135 DATA208,9,169,184,162,127,160,10,32,115,127,162,0,134,167,32,228,255
140 DATA240,251,162,1,134,167,133,0,32,135,127,165,0,201,27,240,206,201
145 DATA13,208,4,162,1,208,22,201,141,208,4,162,2,208,14,201,17,208
150 DATA4,162,3,208,6,201,145,208,5,162,4,76,157,124,201,19,208,4
155 DATA162,5,208,245,201,147,208,6,32,206,126,76,77,123,201,3,208,4
160 DATA162,6,208,227,201,20,240,12,201,148,240,8,201,29,240,4,201,157
165 DATA208,3,108,1,0,162,25,221,230,127,240,27,202,16,248,201,46,240
170 DATA239,201,45,240,235,201,43,240,231,205,126,2,240,226,176,5,205,125
175 DATA2,176,219,76,85,123,133,0,164,198,201,20,208,3,76,8,127,201
180 DATA148,208,3,76,69,127,201,157,208,7,204,122,2,240,27,208,7,200
185 DATA177,196,201,58,240,7,165,0,32,83,125,208,14,165,0,32,83,125
190 DATA198,198,169,58,145,196,32,42,224,76,94,123,201,29,240,4,201,58
195 DATA144,3,76,85,123,201,20,208,3,76,41,127,133,0,164,198,201,46
200 DATA208,6,197,35,240,87,208,4,201,46,144,42,169,0,133,35,172,122
205 DATA2,200,177,196,201,58,240,14,136,41,127,145,196,201,46,208,2,133
210 DATA35,200,208,235,136,165,0,201,46,208,2,133,35,145,196,76,154,124
215 DATA172,122,2,177,196,41,127,201,45,240,18,176,26,200,177,196,41,127
220 DATA201,58,240,6,201,45,240,3,144,241,136,165,0,201,45,240,2,169
225 DATA32,145,196,76,94,123,142,130,2,164,198,177,196,41,127,145,196,32
230 DATA124,125,173,127,2,201,9,208,19,172,128,2,136,177,196,201,32,240
235 DATA249,200,152,56,237,122,2,76,216,124,172,122,2,136,200,177,196,201
240 DATA32,240,249,132,198,173,128,2,56,229,198,133,0,165,196,24,101,198
245 DATA133,196,164,0,136,177,196,72,10,10,104,8,41,63,201,32,176,2
250 DATA9,64,40,144,2,9,128,153,131,2,136,16,230,32,124,125,32,206
255 DATA126,166,0,32,10,126,165,36,240,3,76,68,123,166,0,208,8,169
260 DATA32,141,131,2,232,134,0,32,245,190,32,43,193,72,138,72,160,0
265 DATA165,0,145,68,32,29,198,152,160,2,145,68,136,138,145,68,164,0
270 DATA200,104,145,50,136,104,145,50,136,185,131,2,145,50,136,16,248,173
275 DATA130,2,133,0,32,223,186,96,164,198,177,196,41,127,145,196,165,0
280 DATA32,210,255,164,198,177,196,9,128,145,196,96,32,245,190,32,152,189
285 DATA32,45,201,165,18,240,3,76,0,191,165,17,96,169,128,133,197,169
290 DATA0,133,196,172,123,2,136,132,216,240,14,165,196,24,105,80,133,196
295 DATA144,2,230,197,136,208,242,173,122,2,133,198,96,164,198,136,169,58
300 DATA145,196,165,198,24,109,124,2,141,128,2,168,169,58,145,196,96,32
305 DATA206,126,162,0,142,129,2,160,0,177,68,133,0,240,66,200,177,68
310 DATA133,1,200,177,68,133,2,160,0,177,1,201,32,240,33,201,45,240
315 DATA29,201,46,240,25,162,25,221,230,127,240,25,202,16,248,174,129,2
320 DATA205,126,2,240,7,176,12,205,125,2,144,7,157,131,2,232,142,129
325 DATA2,174,129,2,200,196,0,208,202,134,0,173,127,2,208,23,224,0
330 DATA240,14,162,0,189,131,2,201,46,240,5,232,228,0,208,244,134,0
335 DATA76,124,126,201,9,240,94,224,0,240,92,162,0,189,131,2,201,46
340 DATA240,10,232,228,0,208,244,169,46,157,131,2,133,35,172,127,2,232
345 DATA228,0,176,15,189,131,2,205,125,2,144,7,205,126,2,240,9,144
350 DATA7,169,48,157,131,2,230,0,136,208,226,232,134,0,162,0,189,131
355 DATA2,201,48,208,12,169,32,157,131,2,228,0,240,3,232,208,237,173
360 DATA122,2,24,109,124,2,56,229,0,133,198,166,0,169,0,157,131,2
365 DATA133,36,173,127,2,201,9,208,15,236,124,2,240,41,144,39,169,195
370 DATA162,127,160,18,208,21,173,131,2,201,45,240,1,232,236,124,2,240
375 DATA18,144,16,169,214,162,127,160,15,32,115,127,32,206,126,133,36,208
380 DATA7,169,131,160,2,32,29,187,96,173,122,2,24,109,124,2,168,136
385 DATA169,32,145,196,136,204,122,2,16,248,133,35,96,173,127,2,201,9
390 DATA208,10,169,233,133,1,169,123,133,2,208,18,169,37,133,1,169,124
395 DATA133,2,198,198,165,198,24,109,124,2,133,198,96,164,198,204,122,2
400 DATA240,23,177,196,136,41,127,145,196,200,200,177,196,201,58,240,3,136
405 DATA208,241,198,198,136,208,55,76,94,123,169,0,133,35,164,198,136,177
410 DATA196,201,58,240,12,200,145,196,201,46,208,2,133,35,136,208,237,200
415 DATA208,24,164,198,200,177,196,201,58,208,249,136,196,198,240,10,136,177
420 DATA196,200,41,127,145,196,208,241,169,32,145,196,32,103,127,76,94,123
425 DATA169,0,133,205,133,220,169,146,32,210,255,96,133,33,134,34,177,33
430 DATA9,128,41,191,153,128,135,136,16,244,32,42,224,96,162,79,169,32
435 DATA157,128,135,202,16,250,96,134,0,169,168,160,127,32,29,187,169,0
440 DATA141,183,127,165,0,32,210,255,76,255,179,13,13,7,7,18,69,82
445 DATA82,79,82,32,35,146,32,0,255,73,78,86,65,76,73,68,32,75
450 DATA69,89,84,79,79,32,77,65,78,89,32,67,72,65,82,65,67,84
455 DATA69,82,83,65,77,79,85,78,84,32,84,79,79,32,76,65,82,71
460 DATA69,18,146,27,25,153,14,142,131,7,21,149,141,17,22,150,15,143
465 DATA155,9,137,3,34,44,58,19,145
READY.
```

Load Your Programs Automatically

D. Milnes

All nice and straightforward this month! Machine Code Bubble Sort and Screen Dump requires a 4032 or an 8032, and will do precisely what it says. You'll find all relevant instructions contained in the REM statements in lines 10 to 102.

Trace is another old friend, and will work on Basic 1 or 2 machines. This displays a window in the top left hand corner of the screen which shows the last few lines executed in the main program running. Speed can be controlled by a POKE given in line 1120.

Machine Code entry points is a comparison chart between Basics 1, 2, and 4. Although not a detailed memory map it does show precisely what is happening where in the machine, and should assist in program translation from one machine to another. As ever, we're indebted to Jim Butterfield for this: where would Commodore and the rest of us users be without him?!

M/C BUBBLE SORT AND SCREEN DUMP : 4032/8032

```
10 REM*********************************
11 REM*       ## 4032++8032 ##        *
12 REM*   MACHINE CODE BUBBLE SORT    *
13 REM*         & SCREEN DUMP         *
14 REM*  GLEN PEARCE       25/10/80   *
15 REM*                               *
16 REM*  CALL SORT WITH 'SYS 32200'   *
17 REM*  CALL DUMP WITH 'SYS 32631'   *
18 REM*********************************
19 REM*                               *
20 REM* THIS PROGRAM WILL ONLY SORT   *
21 REM* A SINGLE DIMENSION CHARACTER  *
22 REM* ARRAY.  THE ARRAY MAY BE OF   *
23 REM* ANY SIZE.  ALL THAT NEEDS TO  *
24 REM* BE DONE IN THE CALLING PRGRM  *
25 REM* IS TO SPECIFY THE NAME OF THE*
26 REM*  ARRAY IN THE STRING NAMED    *
27 REM* 'ZX$'.  PROGRAM INSTRUCTIONS  *
28 REM* WOULD APPEAR AS FOLLOWS:-     *
29 REM*                               *
30 REM* EG1: 'ZX$="AA":SYS32200' WILL*
31 REM*      SORT THE ARRAY 'AA$'     *
32 REM*                               *
33 REM* EG2: 'ZX$="H":SYS32200' WILL  *
34 REM*      SORT THE ARRAY 'H$'      *
35 REM*                               *
36 REM* EG3: 'ZX$="B4":SYS32200' WILL*
37 REM*      SORT THE ARRAY 'B4$'     *
38 REM*                               *
39 REM* ALL ARRAY ELEMENTS HAVING A   *
40 REM* 'NULL' VALUE (IE. ""), WILL   *
41 REM*  BE REGARDED AS HAVING THE    *
42 REM*  LEAST VALUE & THUS WILL BE   *
43 REM*  MOVED TO THE BEGINNING OF    *
44 REM*  THE ARRAY.                   *
45 REM*                               *
46 REM*********************************
47 REM*                               *
48 REM* *** IMPORTANT ***             *
49 REM*                               *
50 REM* 1) DO NOT LOAD 'DOS SUPPORT'  *
51 REM*    OR ANY OTHER MACHINE CODE  *
52 REM*    PROGRAM WHILE USING THIS   *
53 REM*    SORT.                      *
54 REM*                               *
60 REM* 2) TO PROTECT THE SORT PRGRM, *
61 REM*    POKE DOWN THE TOP OF RAM   *
62 REM*    BEFORE POKING IN THE DATA  *
63 REM*    STATEMENTS AS FOLLOWS:-    *
64 REM*  'POKE53,125:POKE52,200:CLR'  *
65 REM*  N.B. THESE MUST BE THE FIRST*
66 REM*       THREE STATEMENTS IN     *
67 REM*       YOUR 'BASIC' PROGRAM!!  *
68 REM*                               *
69 REM* 3) IF THE ARRAY TO BE SORTED  *
70 REM*    WAS CHANGED TO A CHARACTER*
71 REM*    ARRAY FROM A NUMERIC ONE,  *
72 REM*    REMEMBER TO RIGHT-JUSTIFY  *
```

```
 74 REM*    THE ARRAY ELEMENTS BEFORE *
 75 REM*    SORTING AS THE PRGRM SORTS*
 76 REM*    FROM THE LEFT.            *
 77 REM*  EG: IF AA$(54)=" 12" AND THE*
 78 REM*    LONGEST ELEMENT IS " 8523"*
 79 REM*    THEN 'SPACE-FILL' IT TO   *
 80 REM*    READ:  AA$(54)="   12".   *
 81 REM*                              *
 82 REM*    (IE: 'SPACE-FILL' THE     *
 83 REM*    ELEMENTS SO THAT THEY ARE *
 84 REM*    ALL RIGHT-JUSTIFIED ACC-  *
 85 REM*    ORDING TO THE LENGTH OF   *
 86 REM*    THE LONGEST ARRAY ELEMENT.*
 87 REM*    OTHERWISE, " 4395" WILL BE*
 88 REM*    REGARDED AS LESS THAN " 6"*
 89 REM*    BY THE SORT LOGIC).       *
 90 REM*                              *
 91 REM* 4) THIS PRGRM WILL NOT SORT  *
 92 REM*    A NUMERIC OR INTEGER ARRAY*
 94 REM*                              *
 95 REM* 5) THIS PRGRM IS COMPATIBLE  *
 96 REM*    WITH 8032/4032 COMPUTERS  *
 97 REM*    (BASIC-VERSION/4 & 32K)   *
 98 REM*                              *
 99 REM**********************************
100 REM
101 REM ***  SCREEN DUMP IS 'SYS32631'  ***
102 REM
200 POKE53,125:POKE52,200:CLR:REM POKE DOWN TOP OF MEMORY TO PROTECT PROGRAM
205 FORI=32200TO32763:READJ:POKEI,J:NEXT
210 DATA165,42,133,88,165,43,133,89,197,45,208,9,165,88,197,44,208,3,76
215 DATA70,126,160,0,177,88,201,90,208,8,200,177,88,201,216,240,14,136
220 DATA165,88,24,105,7,133,88,144,218,230,89,208,214,160,3,177,88,133
225 DATA86,200,177,88,133,87,160,0,177,86,133,32,160,2,177,88,201,2
230 DATA240,8,176,6,169,128,133,33,208,8,136,177,86,24,105,128,133,33
235 DATA165,44,133,90,165,45,133,91,160,0,177,90,197,32,208,7,200,177
240 DATA90,197,33,240,41,165,47,197,91,208,7,165,46,197,90,208,1,96
245 DATA160,3,177,90,24,101,91,133,35,136,177,90,24,101,90,133,90,144
250 DATA2,230,35,165,35,133,91,76,43,126,160,3,177,90,24,101,91,133
255 DATA38,136,177,90,24,101,90,133,37,144,2,230,38,165,90,24,105,7
260 DATA133,90,144,2,230,91,169,252,133,36,165,37,133,75,165,38,133,76
265 DATA165,75,56,233,3,133,75,176,2,198,76,165,76,197,91,208,15,165
270 DATA75,197,90,208,9,165,36,201,191,240,215,76,12,127,165,75,56,233
275 DATA3,133,75,176,2,198,76,160,0,177,75,133,32,200,177,75,133,86
280 DATA200,177,75,133,87,200,177,75,133,33,200,177,75,133,88,200,177,75
285 DATA133,89,160,0,177,75,170,160,3,177,75,133,35,228,35,144,3,165
290 DATA35,170,160,0,152,133,35,228,35,240,18,177,88,209,86,240,8,176
295 DATA13,32,82,127,76,154,126,200,76,237,126,32,74,127,76,154,126,160
300 DATA0,177,90,133,31,200,177,90,133,75,200,177,90,133,76,165,75,24
305 DATA101,31,133,75,144,2,230,76,160,0,165,90,145,75,200,165,91,145
310 DATA75,165,90,24,105,3,133,90,144,2,230,91,165,91,197,38,208,201
315 DATA165,90,197,37,208,195,96,165,32,197,33,144,38,240,36,169,191,133
320 DATA36,160,3,165,32,145,75,200,165,86,145,75,200,165,87,145,75,160
325 DATA0,165,33,145,75,200,165,88,145,75,200,165,89,145,75,96,169,128
330 DATA133,36,169,0,133,35,169,4,133,176,133,212,32,213,240,32,72,241
335 DATA169,23,133,34,169,13,133,33,32,210,255,32,228,255,201,27,240,83
340 DATA169,17,174,76,232,224,12,208,2,169,145,32,210,255,160,0,177,35
345 DATA41,127,170,177,35,69,33,16,11,177,35,133,33,41,128,73,146,32
350 DATA210,255,138,201,32,176,4,9,64,208,14,201,64,144,10,201,96,176
355 DATA4,9,128,208,2,73,192,32,210,255,200,192,80,144,203,165,35,105
360 DATA79,133,35,144,2,230,36,198,34,208,159,169,13,32,210,255,32,204
365 DATA255,96,71,65,80
READY.

TRACE : BASIC 1/2


 50 PRINT"■■■■THIS PROGRAM LOCATES ■TRACE■ IN"
 60 PRINT"ANY SIZE MEMORY THAT IS FITTED...■"
 65 IFPEEK(65E3)=254THEND=2:E=52:GOTO70
 66 IFPEEK(65E3)<>192THENPRINT"?? I DON'T KNOW YOUR ROM ??":END
 67 D=1:E=134:FORJ=1TO1E3:READX:IFX<1E4THENNEXTJ
 70 PRINT"I SEE YOU HAVE AN ";
 71 IFD=1THENPRINT"ORIGINAL";
 72 IFD=2THENPRINT"UPGRADE";
 73 PRINT"  R O M."
 98 DATA -342,162,5,189,249,224,149,112,202,16,248,169,239,133,128,96
 99 DATA 173,-342,133,52,173,-341,133,53,169,255,133,42,160,0,162,3
100 DATA 134,43,162,3,32,-271,208,249,202,208,248,32,-271,32,-271,76
101 DATA 121,197,162,5,189,-6,149,112,202,16,248,169,242,133,128,96
102 DATA 230,42,208,2,230,43,177,42,96,230,119,208,2,230,120,96
103 DATA 32,115,0,8,72,133,195,138,72,152,72,166,55,165,54,197
104 DATA 253,208,4,228,254,240,106,133,253,133,35,134,254,134,36,165
120 DATA 152,208,14,169,3,133,107,202,208,253,136,208,250,198,107,208
136 DATA 246,32,-54,169,160,160,80,153,255,127,136,208,250,132,182,132
153 DATA 37,132,38,132,39,120,248,160,15,6,35,38,36,162,253,181
169 DATA 40,117,40,149,40,232,48,247,136,16,238,216,88,162,2,169
185 DATA 48,133,103,134,102,181,37,72,74,74,74,74,32,-44,104,41
202 DATA 15,32,-44,166,102,202,16,233,32,-38,32,-38,165,184,197,119
221 DATA 240,55,165,195,208,4,133,253,240,47,16,42,201,255,208,8
237 DATA 169,105,32,-30,24,144,33,41,127,170,160,0,185,145,192,48
254 DATA 3,200,208,248,200,202,16,244,185,145,192,48,6,32,-32,200
```

```
271 DATA 208,245,41,127,32,-32,165,119,133,184,104,168,104,170,104,40
288 DATA 96,168,173,64,232,41,32,208,249,152,96,9,48,197,103,208
304 DATA 4,169,32,208,2,198,103,41,63,9,128,132,106,32,-54,164,182
322 DATA 153,0,128,192,195,208,2,160,7,200,132,182,164,106,96,76
333 DATA -255,32,-262
700 DATA 1E10
800 DATA-343,162,5,189,181,224,149,194,202,16,248,169,239,133,210,96
810 DATA173,-343,133,134,173,-342,133,135,169,255,133,124,160,0,162
820 DATA3,134,125,162,3,32,-272,208,249,202,208,248,32,-272,32,-272
830 DATA76,106,197,162,5,189,-6,149,194,202,16,248,169,242,133,210,96
840 DATA230,124,208,2,230,125,177,124,96,230,201,208,2,230,202,96,32
850 DATA197,0,8,72,133,79,138,72,152,72,166,137,165,136,197,77,208,4
860 DATA228,78,240,107,133,77,133,82,134,78,134,83,173,4,2,208,14,169
870 DATA3,133,74,202,208,253,136,208,250,198,74,16,246,32,-54,169,160
880 DATA160,80,153,255,127,136,208,250,132,76,132,84,132,85,132,86,120
890 DATA248,160,15,6,82,38,83,162,253,181,87,117,87,149,87,232,48,247
900 DATA136,16,238,216,88,162,2,169,48,133,89,134,88,181,84,72,74,74
910 DATA74,74,32,-44,104,41,15,32,-44,166,88,202,16,233,32,-38,32,-38
920 DATA165,75,197,201,240,55,165,79,208,4,133,77,240,47,16,42,201,255
930 DATA208,8,169,94,32,-30,24,144,33,41,127,170,160,0,185,145,192,48
940 DATA3,200,208,248,200,202,16,244,185,145,192,48,6,32,-32,200,208
950 DATA245,41,127,32,-32,165,201,133,75,104,168,104,170,104,40,96,168
960 DATA173,64,232,41,32,208,249,152,96,9,48,197,89,208,4,169,32,208
970 DATA2,198,89,41,63,9,128,132,81,32,-54,164,76,153,0,128,192,79,208
980 DATA2,160,7,200,132,76,164,81,96,76,-256,32,-263
1000 S2=PEEK(E)+PEEK(E+1)*256:S1=S2+D-344
1010 FORJ=S1TOS2-1
1020 READX:IFX>=0GOTO1050
1030 Y=X+S2:X=INT(Y/256):Z=Y-X*256
1040 POKEJ,Z:J=J+1
1050 POKEJ,X
1060 NEXTJ
1070 PRINT"■■ === TRACE ==="
1080 REMARK: BY BRETT BUTLER, TORONTO
1090 PRINT"■TO INITIALIZE AFTER LOAD: SYS";S1+17
1100 PRINT"TO ENABLE TRACE:      SYS";S1+56
1110 PRINT"TO DISABLE:     SYS";S1+2
1120 PRINT"■CHANGE SPEED WITH:  POKE";S1+125-D;"■,X"
1130 PRINT"■==MAKE A NOTE OF ABOVE COMMANDS=="
1140 PRINT"■SAVE USING MACHINE LANGUAGE MONITOR:"
1150 PRINT"   .S ";
1160 S=INT(S1/256):T=S1-S*256
1170 POKEE,T:POKEE+1,S
1180 POKEE-4,T:POKEE-3,S
1190 IFD=2THENPRINTCHR$(34);"TRACE";CHR$(34);",01";
1195 IFD=1THENPRINT" 01,TRACE";
1200 S=S1:GOSUB1400
1210 S=S2:GOSUB1400
1220 PRINT:END
1400 PRINT",";:S=S/4096
1410 GOSUB1420
1420 GOSUB1430
1430 T=INT(S):IFT>9THENT=T+7
1440 PRINTCHR$(T+48);:S=(S-INT(S))*16:RETURN
READY.
```

A few entry points, original/upgrade/4.0 ROM; Jim Butterfield

Entry points seen in various programmer's machine language programs. The user is cautioned to check out the various routines carefully for proper setup before calling, registers used, etc.

```
ORIG UPGR  4.0     DESCRIPTION
C357 C355 B3CD ?OUT OF MEMORY
C359 C357 B3CF Send Basic error message
C38B C389 B3FF Warm start, Basic
C3AC C3AB B41F Crunch & insert line
C430 C439 B4AD Fix chaining & READY.
C433 C442 B4B6 Fix chaining
C48D C495 B4FB Crunch tokens
C522 C52C B5A3 Find line in Basic
C553 C55D B5D4 Do NEW
C567 C572 B5E9 Reset Basic and do CLR
C56A C575 B5EC Do CLR
C59A C5A7 B622 Reset Basic to start
C6B5 C6C4 B74A Continue Basic execution
C863 C873 B8F6 Get fixed-point number from Basic.
C9CE C9DE BADB Send Return,LF if in screen mode
C9D2 C9E2 BADF Send Return, Linefeed
CA27 CA1C BB1D Print string
CA2D CA22 BB23 Print precomputed string
CA47 CA43 BB44 Print "?"
CA49 CA45 BB46 Print character
CE11 CDF8 BEF5 Check for comma
```

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```
CE13 CDFA BEF7 Check for specific character
CE1C CE03 BF00 'SYNTAX ERROR'
CFD7 CFC9 C187 Find fl-pt variable, given name
D079 D069 C2B9 Bump Variable Address by 2
D0A7 D09A C2EA Float to Fixed conversion
D278 D26D C4BC Fixed to Float conversion
D679 D67B C8D7 Get byte to X reg
D68D D68F C8EB Evaluate String
D6C4 D6C6 C921 Get two parameters
D73C D773 C99D Add (from memory)
D8FD D934 CB5E Multiply by memory location
D9B4 D9EE CC18 Multiply by ten
DA74 DAAE CCD8 Unpack memory variable to Accum #1
DAA9 DAE3 CD0D Copy Acc #1 to (X,Y) location
DB1B DB55 CD7F Completion of Fixed to Float conversion
DC9F DCD9 CF83 Print fixed-point value
DCA9 DCE3 CF8D Print floating-point value
DCAF DCE9 CF93 Convert number to ASCII string
E3EA E3D8 E202 Print a character
 na  E775 D722 Output byte as 2 hex digits
 na  E7A7 D754 Input 2 hex digits to A
 na  E7B6 D763 Input 1 hex digit to A
E7DE F156 F185 Print system message
F0B6 F0B6 F0D2 Send 'talk' to IEEE
F0BA F0BA F0D5 Send 'listen' to IEEE
F12C F128 F143 Send Secondary Address
E7DE F156 F185 Send canned message
F167 F16F F19E Send character to IEEE
F17A F17F F1B6 Send 'untalk'
F17E F183 F1B9 Send 'unlisten'
F187 F18C F1C0 Input from IEEE
F2C8 F2A9 F2DD Close logical file
F2CD F2AE F2E2 Close logical file in A
F32A F301 F335 Check for Stop key
F33F F315 F349 Send message if Direct mode
 na  F322 F356 LOAD subroutine
F3DB F3E6 F425 ?LOAD ERROR
F3E5 F3EF F42E Print READY & reset Basic to start
F3FF F40A F449 Print SEARCHING...
F411 F41D F45C Print file name
F43F F447 F486 Get LOAD/SAVE type parameters
F462 F466 F4A5 Open IEEE channel for output.
F495 F494 F4D3 Find specific tape header block
F504 F4FD F53C Get  string
F52A F521 F560 Open logical file from input parameters
F52D F524 F563 Open logical file
F579 F56E F5AD ?FILE NOT FOUND, clear I/O
F57B F570 F5AF Send error message
F5AE F5A6 F5E5 Find any tape header block
F64D F63C F67B Get pointers for tape LOAD
F667 F656 F695 Set tape buffer start address
F67D F66C F6AB Set cassette buffer pointers
F6E6 F6F0 F72F Close IEEE channel
F78B F770 F7AF Set input device from logical file number
F7DC F7BC F7DF Set output device from LFN.
F83B F812 F857 PRESS PLAY..; wait
F85E F835 F87A Sense tape switch
F87F F855 F89A Read tape to buffer
F88A F85E F8A3 Read tape
F8B9 F886 F8CB Write tape from buffer
F8C1 F88E F8D3 Write tape, leader length in A
F913 F8E6 F92B Wait for I/O complete or Stop key
FBDC FB76 FBBB Reset tape I/O pointer
FD1B FC9B FCE0 Set interrupt vector
FFC6 FFC6 FFC6 Set input device
FFC9 FFC9 FFC9 Set output device
FFCC FFCC FFCC Restore default I/O devices
FFCF FFCF FFCF Input character
FFD2 FFD2 FFD2 Output character
FFE4 FFE4 FFE4 Get character
```

The idea for the program and techniques involved was born when I was developing a program to catalogue all the directories of my disks on one master diskette which would enable me to find a particular programme easier than looking at the directory of each diskette in turn. Unfortunately the program was written entirely in basic using GET for reading the files from the directory. I found that even on the lowly 4040 disk drive it was taking a good 3 or 4 minutes to read the directory of a nearly full diskette. When I upgraded to the 8050 disk two weeks ago the problem was aggravated threefold. I then looked at the possibility of mixing machine code (for the slower basic GET) and sticking to basic for the more conventional parts of the program thus making changes easier than they would be in machine code.

Before we look at the program it might be interesting to look at the way in which the directory is stored on the diskette.

Each file name including the information relating to blocks and type of file takes up 32 bytes thus each sector can hold eight file entries. The directory can be examined from basic by opening the directory as a read file:—

open 1,8,0,''$0''

then using GET = 1,a$ each byte is read from the directory and if required printed.

The first two bytes of a file are not required and can be discarded, the next two bytes give the number of blocks spanned by the file — lo byte & hi byte. The file name is between quotes and the first of these quotes is searched for and each byte up to this discarded and filled with blanks. Then the file name printed until the closing quotes. The next important information within the 32 bytes is the file type, and this usually takes up three bytes 'prg', 'seq', 'usr' or 'rel'. The exception to this is if the file has been incorrectly closed and in this case the file type is preceeded with an asterisk '*' which is hex 29. The other letters which make up the file type are all greater than hex 29 therefore any byte less than hex 29 can be discarded. Finally to compete the reading of one file entry a check has to be made that the number of bytes read is 32.

lo hi
0 1 0 1 0 8 0 0 — — — ''file name 16 cha''— — — prg—

The machine code section of the program is self explanatory (for basic < 4 change $f215 to$f1e1 and $7 af to $f770). Each file entry is read — quotes and null bytes being discarded (see line = 1260, 1320 and 1400) and the file information stored in memory which is part of the basic program. In fact the string variable a$ (line = 5 of basic) is the position in which file information is stored.

Gosub 5 after the sys command will put the file name and type into $. Line = 6 puts the number of blocks taken the file into b$.

It is important that the lines before and including line = 5 are typed in exactly as shown as any variation in length will move the blanks after a$ in memory. This will cause havoc when the program is run as the file name will probably overwrite parts of the basic program.

A HEX dump is provided — type this in as normal via the machine code monitor (after typing in the basic part) and then still in the machine code monitor save the complete program—

.s'':0:disk loader'',08,0400,0a3c

This will save the whole program — basic and machine code part — and will also save the pointers for the whole program so that it can be loaded with the normal load command.

```
1 :
2 goto62000::"       ++disk auto loader++       ***D.Milnes***Sept 1982
3 :
5 a$="                                                    ":a$=left$(a$,11)
6 b$=mid$(str$(peek(02)*256+peek(01)),2):return
120 sys(s):gosub5:d$(0)=a$:s=2503
130 gosub220
140 forn=1tonn:sys(s):gosub5:d$(n)=a$:ifstthenn=nn+1:goto200
150 d$(n)=b$+b2$+d$(n)
160 print" "d$(n);:printtab(33)"...■ "chr$(ct)" ■":ct=ct+1
170 ifpeek(po)<22then200
180 gosub1000:ct=65:k=k+1:
190 gosub220
200 next:printmm$:gosub1010
210 goto62110
220 printtt$c$"Disk name    ■"d$(0)cr$h$cr$:return
1000 printm$
```

```
1010 gosub2000:ifa$=" "andn<nnthenreturn
1015 ifa$=" "then62110
1020 ifasc(a$)<65orasc(a$)>(ct-1)then1010
1030 pn=asc(a$):pn=(pn-64)+16*(k-1):lp$=d$(pn):lp$=mid$(lp$,9,16)
1040 ifmid$(d$(pn),26,3)="prg"then1090
1050 printsc$"■ERROR■..Not program file..space to cont
1060 gosub2000:ifa$<>" "then1060
1070 ifn<nnthen1000
1080 printmm$:goto1010
1090 l=len(lp$):ifright$(lp$,1)=" "thenlp$=left$(lp$,l-1):goto1090
1100 print"■load"chr$(34)lp$chr$(34)",08":print"■■■■run":close1:close15
1110 poke623,19:poke624,13:poke625,13:poke158,3:end
2000 geta$:ifa$=""then2000
2010 return
62000 print"■":poke59468,14:s=2500:k=1:ct=65:po=216:nn=245:ll=24:open
      15,8,15
62010 dimd$(nn):open1,8,0,"$0":gosub62090
62020 cr$=chr$(13):sc$="■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■":c$=cr$+cr$
62030 tt$="■■DISK autoload■                (c) D.Milnes
62040 b1$="    ":b2$="    "
62050 mm$=sc$+"load <type letter>...terminate <space>"
62060 m$=sc$+"continue <space>...load <type letter> "
62070 h$=cr$+"■BLOCKS■  ■PROGRAM TITLE■    ■TYPE■      ■LOAD■
62080 goto120
62090 input#15,en$,em$:ifen$="00"thenreturn
62100 print"■■Disk ERROR■"cr$em$
62110 close1:close15:end
63999 scratch"disk autoload":dsave"disk autoload"
ready.
```

HEX DUMP FOR DISK AUTOLOAD

```
.: 09C4 4C 1E 0A 4C CA 09 20 24
.: 09CC 0A A5 01 C9 64 B0 12 A9
.: 09D4 20 E8 9D 5B 04 A5 01 C9
.: 09DC 0A B0 06 A9 20 E8 9D 5B
.: 09E4 04 A0 04 C8 A5 96 D0 2D
.: 09EC 20 15 F2 C9 22 F0 02 D0
.: 09F4 F2 C8 E8 20 15 F2 C9 22
.: 09FC F0 06 9D 5B 04 38 B0 F1
.: 0A04 18 20 15 F2 C9 29 B0 02
.: 0A0C A9 20 9D 5B 04 E8 C8 C0
.: 0A14 20 F0 02 D0 EB A9 00 85
.: 0A1C AF 60 20 24 0A 4C E5 09
.: 0A24 A2 01 20 AF F7 A2 00 20
.: 0A2C 15 F2 20 15 F2 20 15 F2
.: 0A34 85 01 20 15 F2 85 02 60
.
```

```
100 ;************************
110 ;*
120 ;* D.MILNES 01/10/82
130 ;*
140 ;* DISK AUTOLOADER
150 ;*
160 ;* M/C CODE LOAD
```

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```
170 ;*
180 ;*******************
190 ;
200 ;
210 ;
220 *=$09C4
900 JMP DISKTI ;2500
910 JMP DIRECT ;2503
1000 ;
1010 ;LOAD DIRECTORY FROM DISK
1020 ;
1030 ;INTO A$ STRING IN BASIC PROG
1040 ;
1050 ;
1060 DIRECT JSR FILEOPN
1070 LDA $01 ;CHECK BLOCKS OF FILE
1080 CMP #100 ;PAD OUT WITH ONE
1090 BCS NOBLANK
1095 LDA #$20 ;OR TWO BLANKS TO
1096 INX
1097 STA $045B,X ;FORMAT OUTPUT
1098 LDA $01
1100 CMP #10
1102 BCS NOBLANK
1104 LDA #$20
1105 INX
1110 STA $045B,X
1120 NOBLANK LDY #$04
1235 GET INY
1236 LDA $96 ;CHECK STATUS
1237 BNE FINI ;FINISH IF NOT ZERO
1240 JSR $F215 ;GET A BYTE
1260 CMP #34 ;COMPARE WITH QUOTES
1270 BEQ QUOTE1 ;DISCARD IF QUOTES
1280 BNE GET ;OTHERWISE DO AGAIN
1300 QUOTE1 INY
1305 INX
1310 JSR $F215
1320 CMP #34 ;CHECK FOR OTHER QUOTE
1330 BEQ QUOTE2
1350 STA $045B,X ;IF NOT STORE NAME IN
1360 SEC ;BASIC AND DO AGAIN
1365 BCS QUOTE1
1385 QUOTE2 CLC
1390 JSR $F215 ;CHECK IF LESS THEN *
1400 CMP #$29 ;INDICATES UNCLOSED
1410 BCS LESS ;FILE
1420 LDA #$20 ;PAD OUT IF NOT
1430 LESS STA $045B,X ;AND STORE
1440 INX
1450 INY
1455 CPY #32 ;CHECK IF END OF FILE
1460 BEQ FINI ;INFORMATION
1465 BNE QUOTE2 ;IF NOT DO AGAIN
1490 FINI LDA #$00 ;RESTORE TO
1500 STA $AF ;KEYBOARD
1510 RTS
```

```
 1520 ;
 1530 ;
 2000 ;DISK TITLE INPUT
 2010 ;
 2020 DISKTI JSR FILEOPN
 2030 JMP NOBLANK
 3995 ;
 3996 ;
 3997 ;CMD FILE
 3998 ;FILE OPEN FROM BASIC 1,8,0
 3999 ;
 4000 FILEOPN LDX #$01 ;LOG FILE NO
 4001 JSR $F7AF ;CMD FILE $F770 BASIC2
 4002 LDX #$00
 4010 JSR $F215 ;DISCARD TWO BYTES
 4020 JSR $F215 ;GET A BYTE $F1E1 BASIC2
 4030 JSR $F215 ;NO OF BLOCKS LO
 4040 STA $01
 4050 JSR $F215 ;NO OF BLOCKS HI
 4060 STA $02
 4070 RTS
 63998 END
 63999 SCRATCH"DISKLOAD.*":DSAVE"DISKLOAD.SS"
READY.
```


Thanks to Glen Pearce, Brett Butler and Jim Butterfield for their contributions this month. Never was so much owed by so many to so few!

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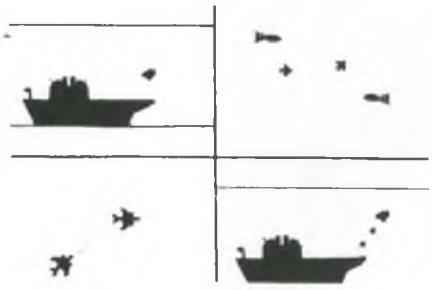
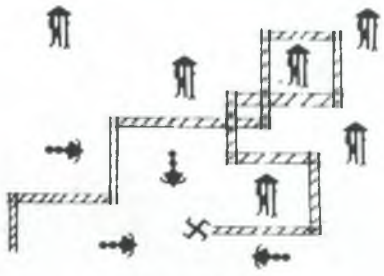


SHARK ATTACK

For unexpanded Vic20

You are in shark-infested waters after being thrown overboard from a pirate ship. Your only protection being an atomic net which you trail behind you, trying to cover all the visible ocean and ensnare the sharks at the same time. Beware of stopping or covering your tracks for too long, if you do, then the sharks will escape and come after you. Watch out for the ever increasing deadly octopi (somtimes the sharks will eat part or all of one!)



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Blackjack, Decipher, Four Thought and Teaser are our computerised versions of very popular home games and will test your mental agility and skill for many a long hour.

BLACKJACK

You start with £1,000, the objective being to break the bank, to do this you have to win (including your starting money) £20,000.

Instructions. You have to score nearer (but not over) 21, than the computer does. The computer deals your first card, you then place your bet and hit the return key, the computer then deals your second card. If you want another card hit the "C" key, if not hit the "S" key.

Points. Ace 1 or 11. Jack, Queen, King 10.

Scoring 21 points with 2 cards — you automatically win.

Scoring 21 points or less with 5 cards — you automatically win.

Draw — the computer wins.

Your kitty is automatically adjusted win or lose. If you lose all your kitty — game over.

DECIPHER

You have to guess what combination of colours the computer has selected — to enter a colour just hit the colour button on the computer, when you have entered your five choices of colour, the computer will display (a) Nothing at all — none right; (b) Black or white squares or both — for every black square you will have a correct colour in the correction position, for every white square you will have a correct colour in the wrong position. If you cannot find the complete combination, it will be displayed when you have had twelve attempts.

FOUR THOUGHT

You have to make a line of four squares — horizontally, vertically or diagonally BEFORE the computer does, taking turns to take a square (squares can only be placed at the bottom of the grid or on top of another square). **Keys.** Hit the number key of the column you want your square dropped in, then hit the return key.

TEASER

The aim of the game is to score "15" BEFORE the computer does, using any combination of three boxes. If you cannot score "15" then you must try and stop the computer from doing so and force a draw. **Keys.** Hit the number key of the box that you want (you can only select an empty box).

MULTISOUND SYNTHESIZER

For the unexpanded Vic20

The Vic Multisound Synthesiser is very flexible and can be played in more ways than can ever be explained here, to create music and special effects. For example, create any tune, up to 255 notes (after following appropriate instructions), then press "F1" or "F3", then key "9" and enjoy the added effect. Now hit "+", listen to the difference. For a surprise — hit "−". Now add a melody over the top — hit key "8" then "7" — now play a melody, or experiment. *Have fun!*

For the unexpanded Vic20

SEA INVASION

Fight off the attacking sea creatures for as long as you can. Shoot the whale for a surprise score, watch our for the crabs, starfish and octopi.

You are a commander of a fleet of destroyers. Looking on from the safety of Mother Ship, you send in one destroyer at a time to blast a passage through the

MOONS OF JUPITER.

Your destroyers have to dodge and blast the UFOs . . . Watch out for the Gologs, they can smash your destroyers, but you cannot harm them.

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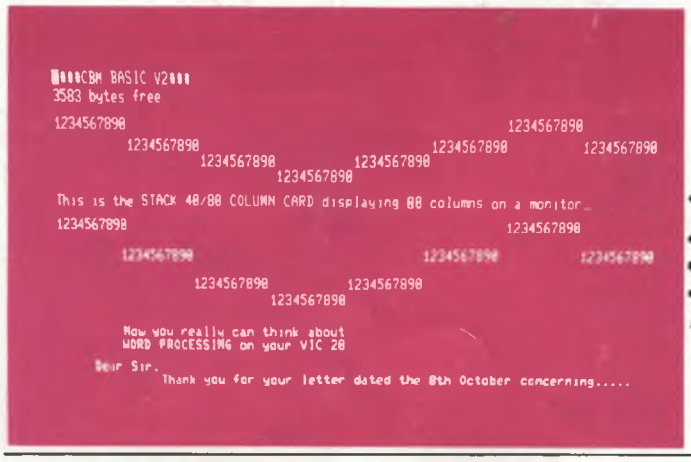

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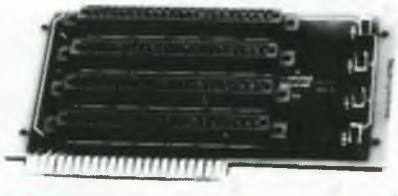

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