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TPUG Magazine

Publisher: Louise Redgers
Editor: Nick Sullivan
Assistant Editor: Marya Miller
Production Assistant: Astrid Kumas
Cover Photo: Roberto Portolese Studio
Typesetting: Noesis, Toronto, Ontario
Printing: Delta Web Graphics, Scarborough, Ontario

TPUG Magazine is published 10 times a year by Toronto Pet Users' Group (TPUG) Inc., the world's largest Commodore users' group. TPUG is a non-profit corporation dedicated to the service and support of owners and users of Commodore computers.

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Correspondence: Send change of address and subscription enquiries to: TPUG Inc., Address Changes, 101 Duncan Mill Road, Suite G7, Toronto ON, Canada M3B 1Z3. TPUG magazine welcomes freelance contributions on all aspects of Commodore computing. Contributions should be sent on disk, though accompanying hardcopy is welcome. Be sure to include return postage if you wish materials returned. Please indicate on the disk label which Commodore disk format and word processing program you have used. Remuneration for articles published is $30.00 per page if the author retains the copyright, and $40.00 per page if the copyright is assigned to TPUG Magazine. All contributions are subject to editing for length and readability. Address editorial contributions to: The Editor, TPUG Magazine, 101 Duncan Mill Road, Suite G7, Toronto ON, Canada M3B 1Z3.

Circulation:
Subscription 16,000 Newsstand 10,000
ISSN #0825-0367

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Inside Information

Karl Hildon of *The Transactor* magazine has a habit of signing off his editorials with the phrase: "There's nothing as constant as change." He knows what he's talking about.

During the past two months we've moved our offices (correspondents take note) from our creaky old place on Avenue Road to a more comfortable suite in Don Mills, a few kilometres east of Toronto's Yonge Street spine. That, more than anything else, is why this issue of *TPUG Magazine* is reaching you a couple of weeks later than we had originally planned. We're sorry about that — look for future issues to gradually move back towards our normal scheduling.

Meanwhile, Commodore has finally managed to bring the fabled Amiga into presentable form, and they are still claiming that they'll have machines in US stores some time in September, with Canadian shipments beginning a month later. We hope they can bring it off, though the continued absence of the C-128 from the marketplace makes a certain amount of skepticism pardonable. At any rate, as Louise Redgers points out in our feature article this month, Amiga purchasers should not have to put up with the software drought that has plagued the introductions of other Commodore machines — big name manufacturers like Electronic Arts have been working on Amiga titles for some time, and their stuff should be ready to coincide with the machine's release. Already the Amiga has its own magazine, *Amiga World*, from the publishers of *RUN*. Judging from the premiere issue, it looks like the finest magazine currently being produced for any unavailable computer.

While we're on the subject of new magazines, we should mention *The TORPET*, which (as many of you know) was once upon a time the official magazine of the Toronto PET Users' Group, edited and published by Bruce Beach. *The TORPET* vanished around the beginning of 1984, only to re-emerge a couple of months ago — still published by Bruce Beach — with a very different face. Once concerned with Commodore computers, *The TORPET* now focuses exclusively on arcane possibilities in oceanographic research, and the word TORPET itself is now an ingenious acronym reflecting this new direction. It should be emphasized that the new *TORPET* has no relation to Commodore or any other species of computer, nor any relation to TPUG.

PaperClip Clobbers Big Guns

Those who have been making do with inexpensive 8-bit machines for their word processing until they can afford something better, should perhaps think again. At a word processing 'rally' held at McMaster University in Hamilton, Ontario, last May, the popular Batteries Included program **PaperClip** confounded the experts by taking both the top places in the price/performance category, competing against big names like IBM, Xerox, NCR and Olivetti. Even in the competition for total points, **PaperClip** — which was the only home computer entry — finished a respectable fifteenth among the fifty or so competitors. **PaperClip** won first place with an Atari 800 XL based system, and second place with the Commodore 64. The rally was sponsored by the Canadian Science Writer's Association. Not surprisingly, Batteries Included is hoping it will become an annual event.

The OS/9 BASIC Benchmark

A few issues back, we reported a benchmark test that pitted several BASIC dialects against each other, including PET 4.0 BASIC, IBM's BASIC-A, Waterloo's mBASIC and BASIC-09 running under Super-OS/9. Reader Bob Wherritt has sent us a version of the same benchmark for the COMAL 2.01 cartridge, for the Commodore 64. COMAL ran the test in 565 seconds, still slower than BASIC-09, but faster than any of the other BASICs tested. He also reports that the benchmark times on his SuperPET were slightly different than our results (BASIC 4.0 was faster and mBASIC was slower) and wonders if this could be related to the three-board configuration of his machine. Does anyone know the answer?

Paper Chase

The paper we're using in this issue of *TPUG Magazine* is not the paper we have used in the past. Not only that, but don't be surprised to see us change paper a couple more times in months to come. In July, the Canadian government in its infinite wisdom decided to jack up the postal rates, especially those on third class mail — the category in which we belong. The extra cash that now goes to the post office has to come from somewhere, and the most obvious somewhere available to us was magazine paper, a million or so pages of which are printed every month. Please bear with us while we hunt around for a less expensive paper that suits us. With any luck, we won't have to compromise quality in the long run.

Library Additions

Back in January, we changed the format for our listings of the additions to the TPUG software library. Previously we had reprinted the 'list-me' files found on each disk; we abandoned that format in favour of less comprehensive but more detailed prose descriptions of the disk contents. We have received reactions both pro and con, the most commonly voiced objection being that not all programs were always included in the descriptions. Starting this month, we're going to try for a compromise that we hope will satisfy all readers. The librarians will describe their new disks as usual; however, we will also include on the 'Library Additions' pages the actual disk directories. Let us know how you feel about the new format — we want to make the 'Library Additions' as useful as possible.

Next Month

Our feature article next month will be on computer music, with special reference to the Commodore 64. Toronto writer Tim Grantham will explain the strengths and weaknesses of the 64's famous SID chip, and will provide a comprehensive rundown on the music products, software and hardware, that you can buy.

We'll also be running a special article on the Delphi and CompuServe information services. It is our understanding at press time that TPUG will have a presence on these services starting September 1 for CompuServe and October 1 for Delphi. Look for information on special sign-up rates for TPUG members.

Nick Sullivan
Editor □

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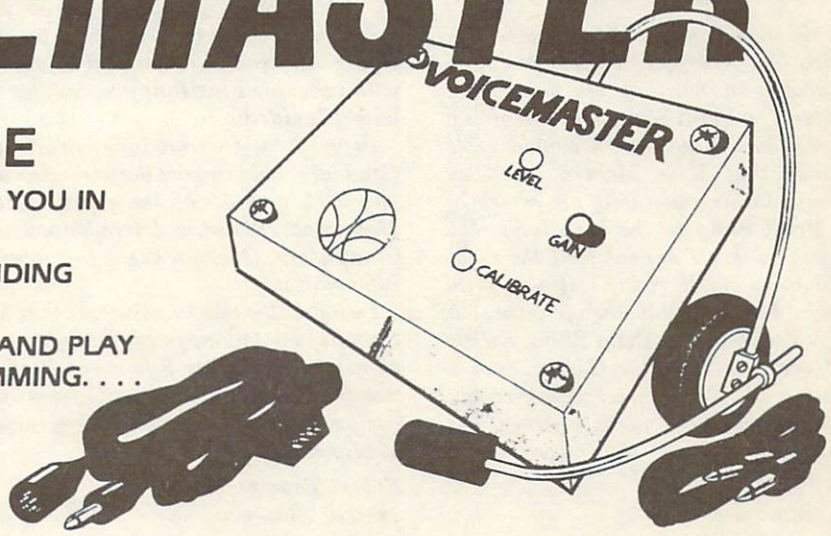

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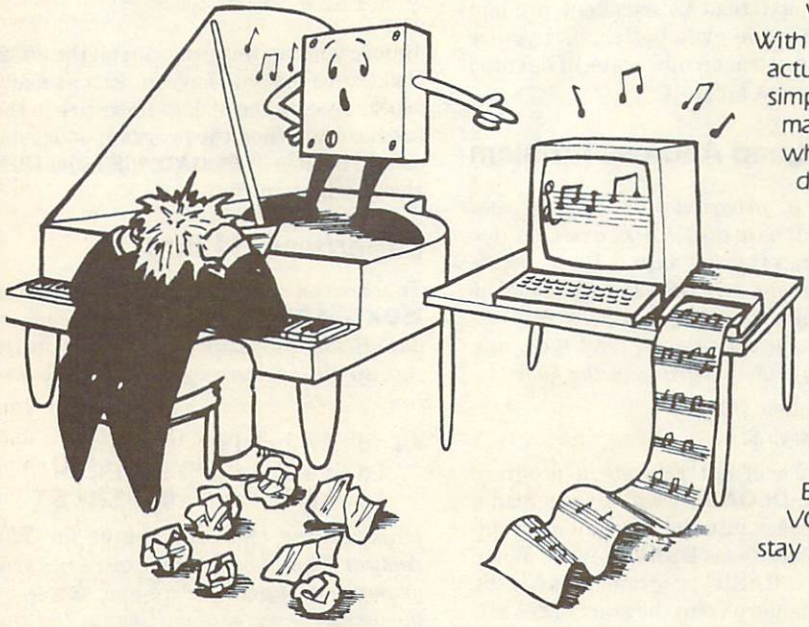

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The Answer Desk

with Malcolm O'Brien

Screaming, Jumping Gemini

I am using a Gemini 10X printer with a Cardco G+ interface. These work harmoniously on most of my programs; however **The Print Shop** *has been giving me problems. I note with considerable pleasure that Mike Martin mentions Gemini in connection with his review of* **The Print Shop** *in the May issue. My problem is that I cannot find the right combination of DIP switch settings to run the print head smoothly when printing out my creations on* **The Print Shop**. *Either I get screams from the Gemini and a cessation of printing part way through; or else the print head moves so jerkily that it actually throws the ribbon. Any suggestions?*

R. L. Morris
Cultus Lake, BC

In order to ensure excellent results, Broderbund has seen fit to support a variety of popular printers (alas, the 1526/802 is not one of them). Do *not* use the 1525 version with your interface set for 'emulation' mode. Referring back to Mike's article, he was very pleased with his results and noted that all nine print wires were active while printing. To get these results, you should be using the Gemini version of **The Print Shop** and have your interface set to 'transparent' mode so that the Gemini codes are passed directly from **The Print Shop** to your printer without any intermediate translation. Strange noises and jerky printhead movement seem to be part and parcel of graphics printing in general, so you shouldn't be too concerned.

As for throwing the ribbon, a closer examination of your letter and envelope revealed faint 'smudge lines' that lead me to believe that you've installed your ribbon incorrectly. There's a metal sheet in front of the printhead: if you put the ribbon in front of the metal piece, you'll get some smudging, and occasionally throw the ribbon. The ribbon should actually be threaded between the printhead and the metal piece. This will yield cleaner print and an unthrowable ribbon.

Flexidraw update

I would like to respond to the letter by Patrick B. Hagood of Ann Arbor, Michigan, in your April issue.

Inkwell Systems has included a printer-driver for the 1526 in its fifth update to the ***Flexidraw*** *light pen/graphics program. Also,* ***Flexidraw*** *contains ten font styles. Additional fonts may be created with Inkwell's* ***Flexifont*** *program for use with* ***Flexidraw***.

Interested Commodore users (in Canada) should contact the advertisers on pages 15 and 51 of the April ***TPUG Magazine*** *(Phase 4 Distributors and Computer Networxx) for more information.*

I would also like to point out that Mr. Hagood is not alone in his quest for 1526 support. ***Flexidraw 5*** *is a result of the many letters we received from our customers and interested Commodore 1526 owners.*

Robert Thompson
Inkwell Systems

Thanks for your letter, Robert. And thank you for being responsive to the computing public. It's very encouraging for users to see ongoing support and periodic updates. An excellent product has been made even better, and you're certain to attract a new wave of devoted customers as a result.

B-128 Load Address Problem

I wrote a program on an 8032 and ***DSAVE****d it onto a 4040 disk drive. I later loaded the program into a B-128, made some changes and* ***DSAVE****d again. Now when I load the program back into the 8032, the system crashes. Isn't there any way to use the program in the 8032?*

P. W. Kelley
Rapid City, SD

The 8032 will not relocate a program when you **DLOAD**. It will always load a program back into the same memory addresses that it was **DSAVE**d from. When you save a BASIC program, it saves the area of memory from the start of BASIC (at memory address $0401 in the 8032) up to the end of your program (which is marked by the BASIC editor with three zero bytes). The first two bytes of a program file contain the address in memory where the file was saved from (in standard low-byte/high-byte format). One of the unusual things about the B-128 is that its start of BASIC memory address is $0002. This is the cause of the problem. Your program is being loaded into the 8032's 'zero page'. The zero page is 256 bytes that are used by the operating system to keep track of all the work it has to do. Since your program is probably longer than one block, it is also corrupting the 'stack' — another area of memory that the operating system uses for temporary storage of data. The effect is analogous to suddenly forgetting everything that you ever knew!

Fortunately, the solution is simple. All you have to do is change those first two bytes that tell the computer where the file was saved from. The following program will do the trick:

```
1 open 2,8,0,"<source
  file name>"
2 open 3,8,3,"<destinati
  on file name>,p,w"
3 get#2,a$,b$
4 print#3,chr$(1);chr$(4
  );:c0=0:c2=2:c3=3
5 get#c2,a$:ss=st
6 print#c3,a$;:if ss=c0
  goto 5
7 close 3:close 2
```

Before you run this program on the 8032, make sure that you have at least as many blocks free on the disk as there are in the source file. When the program ends, you should be able to **DLOAD**, **LIST** and **RUN** the destination file.

Superbase 64 hint

To search on a date, use the match criteria < or >. Sliding matches do not work in date fields. For example, if you want to call up all the January records, use this line:

```
find "Keylist" where
  [date] is ">31DEC84";
  [date] is "<01FEB85"
```

I am willing to be a resource for ***The Answer Desk****. I have some experience programming* ***Superbase 64*** *and accessing the printer features of the Gemini 10x and the Card/Print +G interface through* ***EasyScript****.*

Cynthia Wood
HHB G4 32d AADCOM
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Thanks for the help, Cynthia. One man does not an *Answer Desk* make. You can expect to start getting some interesting mail soon... □

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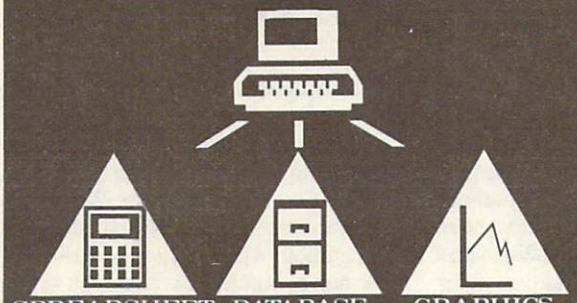

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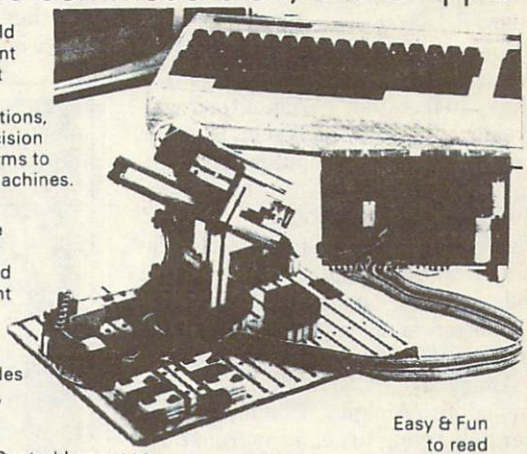

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The Amiga, Dawn of a New Era

by Louise Redgers

The launch of the Amiga on July 23 put the computer world on the threshold of a whole new era. With the colour, voice and speed that the Macintosh lacks, graphics that surpass the IBM PC, and a new ease of use that will allow the beginner to operate the machine with no training, the Amiga appears destined to be a hit for Commodore. Competitors should be nervous about the future of their machines in comparison to the Amiga, on both price *and* performance points.

For approximately three thousand dollars Canadian (two thousand US) we will be able to purchase a 512K Amiga with an RGB monitor that will allow the user to fully experience the colour and graphics in 80 column mode. The machine will also run off a colour TV or a composite monitor in 40 or 60 column mode. Complete with a built-in 3 1/4 inch 880K disk drive, the unit is ready to attach to standard RS 232 devices. It is noteworthy that Commodore refuses to commit themselves as to the market niche for the machine. In fact, they go out of their way to avoid saying that the Amiga is either a home or business computer. They do, however, promise that this is the first of a new family of computers.

The entire system (excluding the monitor) weighs only about thirteen pounds, but it is capable of the work of much larger minicomputers. This new generation of computer is to be known as the 'Amiga from Commodore', not the 'Commodore Amiga'. Commodore is desperately trying to get away from their 'computer toy' image, with this machine.

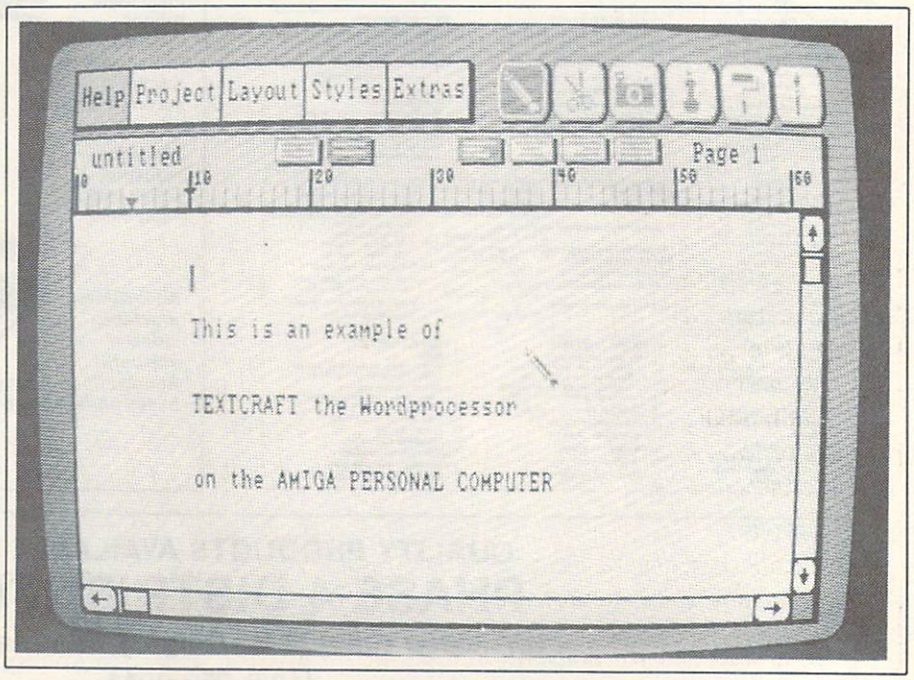
Commodore PC Compatible

The Amiga is based on the 68000 16/32 bit technology, and thus is not compatible with any previous Commodore computers except (using a special emulator) the Commodore PC, a machine manufactured in Germany for the European and Canadian markets only. Within a few months of Amiga's release (September in the US, October in Canada), the PC emulator and optional 5 1/4 inch floppy disk drives will be available, so that the vast amount of PC software can be run on the machine. This will greatly enhance the list of available software packages. The cost of the emulator is to be about 150 dollars, and the disk drives have been quoted at prices ranging from 325 dollars US each to 650 dollars Canadian. This will, of course, become clear at the time of release.

With 256K bytes of RAM, expandable up to 512K internally and up to 8 Megabytes externally, there is ample room to run even the largest business application software. The system also has 192K of ROM, which contains some of the operating system instructions, with the rest loaded into RAM from disk. The operating system, AMIGA DOS, will be on disk with the release version of the machine; after loading, approximately 130K of user memory will remain (in the 256K configuration). Each machine will also be shipped with a BASIC language disk, like the IBM PC BASIC. The system has a mouse as well, which can be used if the operator desires, but all functions can also be accessed via the keyboard.

The system uses icon driven menus, operating on the simple principles made familiar by the Macintosh. What is really sensational, and destined perhaps to bring about a great change in the way we use our computers, is that this system is truly multitasking. What exactly does that mean? It means that I can now do word processing while my data base of twenty thousand customers is being sorted into postal and zip code order, while at the same time I am waiting for my autodial modem to get me online to the TPUG BBS. Word has it that some thirty tasks can be performed simultaneously, depending on the size of the various tasks and the amount of memory available.

The keyboard is substantially different from the one with which Commodore users are familiar. It has the standard typewriter layout, a 13-key numeric keypad and ten programmable function keys, as well as the standard cursor keys and a HELP key. Those who are used to



Icon-driven applications programs like ***Textcraft****, a word processor, will bring to Amiga users the friendliness and ease of use pioneered by Apple's Macintosh computer.*

the IBM PC keyboard will find the touch about the same, but the location and usage considerably different.

Colour and communications

Communications capabilities are built in, but a modem is required. Commodore is recommending a 1200 baud modem, but 2400 baud will be available. Your choice will be governed by your own communications needs.

The colours are exceptional. From 4096 available colours, a palette of 16 or 32 can be chosen to work with at one time. The exact number available depends on the screen resolution being used. Possibilities include 640 by 400 with 16 colours, 640 by 200 with 32 colours, 320 by 400 with 16 colours, and 320 by 200 with 32 colours. The Amiga can display pictures of the quality of the mandrill on this month's front cover to the point where one can hardly tell that they are computer pictures at all. Designed for specialist uses, such as the production of high quality slide presentations, and for headlines for TV newscasts, the system now opens up a whole new market for the microcomputer.

The Amiga can talk. With about twenty lines of BASIC code, it can utilize routines that allow speech synthesis. While the voice has problems with pronunciation of certain words, this can be overcome with a quick change to the phonetic spelling. With both a male and female voice, the system has great potential for use with children and learning software. The voice is quite clear, though the accent may take a little getting used to.

Icon driven music software will make it easy to use the Amiga's powerful four-channel sound synthesis capability. You point the arrow at the instrument, set the voices and the volume, and let it go. The system comes with everything from a pipe organ to an electric guitar to snare drums. This should provide hours of enjoyment to any computer music enthusiast, but going beyond this are the possiblities for professional use with such a high quality of sound. Background music can be digitally recorded — and recorded over — for sound mixing capabilities that will rival expensive sound studios. Some expansion of these capabilities is planned, including a piano-style keyboard.

Software available

Now comes the question of software. Commodore has timed things so that software should be available upon release, and should keep coming while new developers begin working. A word processor (**Textcraft**), accounting software (**Rags to Riches**), a painting package (**Graphicraft**), an animation package (**Moviecraft**), a C Compiler, Logo, a database manager (**Enable**) and a spreadsheet, as well as games and educational software, will be available upon or within two months of the Amiga's release. An optional 20 megabyte hard disk and tape backup from Tecmar will also be available upon release. All the software shown at the Canadian presentation appeared to be working and ready for release. This should keep at bay those who traditionally complain that Commodore releases a machine with no software to run on it.

The Amiga system will be marketed through existing Commodore systems dealers in Canada, as well as the few who remain in the US. The bulk of the work lying ahead for Commodore, though, is to find new outlets for this sophisticated machine. We will never see this one sold in K-MART stores, as it requires a substantial outlay of cash, and some training is required to fully demonstrate the machine's capabilities to potential purchasers. However, with a new executive team and this superb machine, Commodore should be able to emerge as an industry leader at a time when other manufacturers are struggling to survive. □

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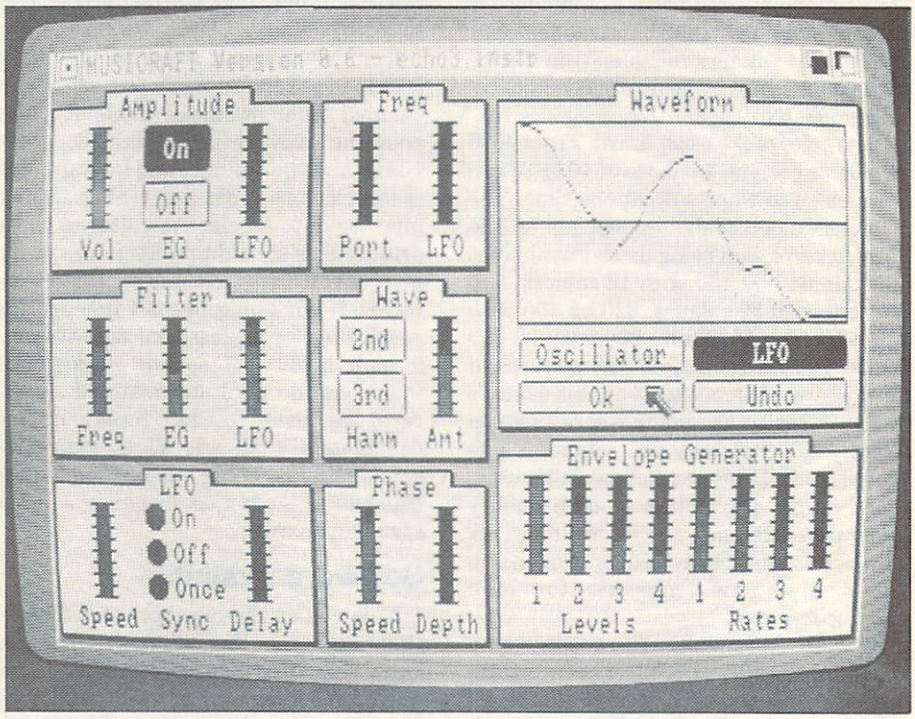
A Technical Peek at the Amiga

by Louise Redgers

When Apple released the Macintosh, it was a great user's machine, but had nothing to offer the hacker or software developer. Programming required an expensive development package, priced beyond the means of most home users. This discouraged the hacker from purchasing the machine. While the Amiga shares the Motorola 68000 chip with the Macintosh, as well as the use of pull-down menus and icons, the similarities end there.

From all appearances, the Amiga is truly a programmer's delight. It comes with a Microsoft BASIC, and a C Compiler will be available upon release. Programs written in C will be transportable from other machines, and will run fast enough that hand-assembled code will not be necessary for most applications. Much of the software now being developed for the Amiga is written in C. Other languages that will be available almost at once are Lisp, Logo, and the famous Turbo Pascal.



Animation and graphics

Sprite graphics, which were considered an advanced feature on the C-64, are much more powerful on the Amiga than on the older machine. Sprites can be fully animated with four movable characteristics. Eight sprites with sixteen colours each can be on the screen at any one time. Though they are of limited width — as on the C-64 — the height of Amiga sprites is limited only by available memory. Background maintenance is done by the system. In addition to the eight hardware sprites, an arbitrary number of software pseudo-sprites can be easily defined and manipulated.

With these capabilities (and a wide variety of built-in routines to take advantage of them), graphics and animation work beyond anything attainable on the C-64 should be within reach of most programmers. Figures can easily be moved about on the screen, passing in front of or behind other objects at several levels of priority, and they can even have shadows.

The Talking Amiga...

Speech is standard on every system. As with the other features of the Amiga, the speech is controllable using system calls from BASIC, with no need for peeks and pokes. This makes programming a lot easier, in that one no longer has to worry about safe locations for storing and retrieving data. The voice can be controlled by about fifteen lines of BASIC code. It can have a masculine or feminine pitch to it, but to me, it still sounds like a computer.

I can only guess that programming pull-down menus and icon-driven software will be relatively easy, given the built-in support for these features. If so, it will open up a whole new world of software development in the educational environment. Parents will be able to create colourful displays that will be easy for even toddlers to use, if they can point at the activities they wish to perform. When integrated with the speech capability, this will also aid in the teaching of disabled children and adults.

Amiga's future

Until we at TPUG actually get a machine for review, we can only echo what we have been told at press conferences, and what we have been able to pick up from watching others demonstrate the machine. It looks like this will be a good hacker's machine, but only time will tell. Commodore is counting on it rather heavily to put them back out in the forefront of the microcomputer market. The Amiga is capable of this technically, but only with the right software and hardware support. Advertising will be crucial, but even more important will be the 'after sales' support by the dealers. Their ability to give straightforward answers to complex technical questions will make or break this machine.

Commodore seems to be aware of the pitfalls. They are planning a dealer training program, as they claim that the average computer store clerk is going to need expertise if he is truly to show off the features of the machine. This may be true, but creating robot-like figures that can only answer canned questions will not aid those like you or me who wish to delve below the surface.

What does TPUG plan to do about the Amiga? We intend to offer full support to this new family of Commodore machines. Many of us have already ordered, or have decided to order, the machine. Some of the experts already have them. We are going to want public domain software of all kinds. And you can expect to see articles covering every aspect of the Amiga, from software availability to technical fine points, in future issues of *TPUG Magazine*.

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The Joy (and Pain) of Spaghetti

by Jim Butterfield

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I recently received a letter from Syd Bolton, who was most enthusiastic about 'free-form' programming. You know the sort of thing — the first step is to turn the computer on. The next is to write a dozen lines or so; after that, decide what you want to do. Under no circumstances is any planning to take place before switching on, and work with pencil and paper is unthinkable.

I'm overstating the case, of course. The point is — and several writers have pointed this out lyrically — it's great fun to horse around with code and see how (or if) you can get things to come out. I've even been quoted myself as saying that one of the marks of a virtuoso programmer is the ability to convince people that the program you ended up with was really what you intended to do in the first place, more or less. To put it poetically, it's a heck of a hacker who can hook the hawks on hoke code for hicks.

Fooling around can be a lot of fun, whether you do it in school, at the beach, or while programming. If your object is to have a good time, go ahead, with my blessing. If your object is to have a good program, well...

It's a lot of fun to eat a good meal: it's not so much fun to plan and prepare it beforehand, or to wash the dishes afterwards. I suspect it's the same thing with programs. It's more fun to dive in and chop at the code: it's much less fun to plan before and document afterwards. When I look at some programs, I sometimes wish that the programmer had worn a bib when writing it. I can see the litter of leftover and patched-up code in there.

If you're writing a one-shot program for your own use, go to it. If it slugs away for two minutes and then reports **?SYNTAX ERROR IN LINE 5870**, chop in a repair and run it again. And if the repair doesn't work, try another chop. If *that* doesn't work, sit down and think. Sound familiar? That's what you get when you hack at a program, and it can be lots of fun.

But be aware that free flight coding does have its problems. Such as: (i) you drag the program out six weeks later and can't read it yourself; (ii) you make a small change and the whole thing collapses for no apparent reason; (iii) you give away or sell copies, and people phone you telling you things that don't work properly; (iv) your program wins a prize in 'worst code of the year'; (v) somebody sends you a 'cleaned up' rewrite of your program that uses one third of the lines; (vi) you wrote it for ten provinces, and it turns out that it cannot be converted to fifty states without a total rewrite.

It's okay to write green slime coding. But keep in mind the following thoughts. If you want to publish or sell it, you'll want to do massive cleaning up. Also, well-shaped coding gives you a good feeling; you feel proud of not just the program, but also the coding it contains. Moreover, if you get into trouble, you can scrap the old program and start over.

...When I look at some programs, I sometimes wish that the programmer had worn a bib when writing it...

When you rewrite it you may have nothing written down, but you'll have a plan: the organization of the program as you perceived it on the previous write.

If you write 'natcheral' code and enjoy it, and if your programs work, good for you! It's hard to knock a working program. But there's another factor: pride of workmanship. Sometimes you just feel good about a program that you have written. You may not know why, but you'd like to show the coding to others because the parts fit together so neatly. When this happens, it's usually a question of style. Often, you've solved a specific problem in a general way. For example, you might have calculated the average value of five numbers, but you've done it in such a way that a minor change would perform the same calculation for a hundred values. You've gone from the specific task to a general solution, and that makes you a more powerful programmer.

You might have heard a lot of talk about 'structured', 'goto-less', or 'top-down' programming. These are essentially concerned with planning, rather than programming as such (although it's easy to be misled by the mechanics). Their general objective is to encourage you (or shove you) into creating a program that flows in an orderly way, rather than hopping around. A program should be something like a railway line, with main line, spurs, and sidings clearly identified; it shouldn't be like a city map with no clear path from one point to another. I see programs in which the programmer seems to have arrived in a maze of twisting little passages, all the same.

You might think that you write only one line at a time, but it's not so. If you write **FOR J=1 TO 10** in a program, you're engaged in planning ahead. You plan to repeat the next few statement ten times, and you've committed yourself to eventually writing a **NEXT J**. There's no such thing as truly barefoot programming — your mind is always thinking a few lines ahead, and you're always planning. The real danger is to write **IF X>10 GOTO 575** hoping that when you get to 575 you will have figured out what to do when *X* is greater than 10.

But whether or not you admit to planning, whether or not you do more of it or less of it, do continue to have fun with your programming. And if you can break the rules and still come up with a neat program that works well, more power to you. □

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Software Piracy

by Bryan J. Lunt

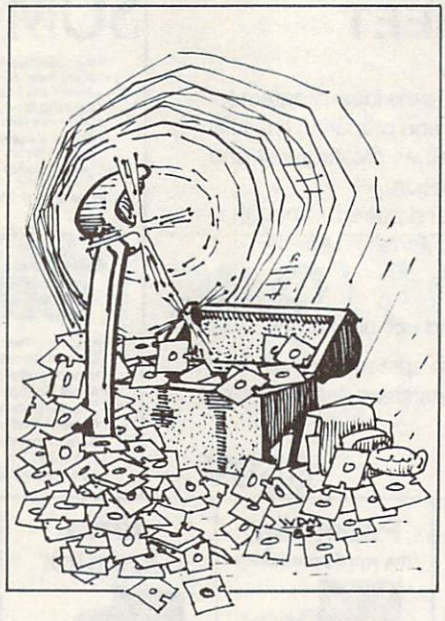
Like Pagliacci's clown the software industry alternates between ecstasy and rage. Although software sales are in the billions of dollars, the rapid increase in its losses to piracy cannot be overlooked. Estimated at 20 per cent of the industry's gross in 1982, software theft doubled in 1983 and continues to escalate. Bruce Hampton, business manager of the Canadian Computer Dealers Association, uses Lotus Corporation's **Lotus 1-2-3** package to illustrate what's happening: "It requires considerable outlay for a retail store to carry this type of program, and development costs have been estimated at close to one million dollars. However, four months after its release, pirated versions were being offered at 25 dollars. For each legitimate sale, we estimate nine illegal reproductions have been put into circulation. With competition like this, it is inevitable that stores will go out of business and manufacturers will become reluctant to risk capital on sophisticated programs." Attorneys for Lotus claim that piracy has cost the company several million dollars in sales.

John Loveless, who was vice president of marketing for Synapse Software before its demise, has said that Synapse's **Slam Ball** game suffered from widespread copying. Synapse's C-64 version of **Zaxxon**, a project that required a large upfront royalty payment, also met heavy competition from the 'alternative market'. "We stopped sending out review copies to improve the shelf life", Loveless said, "but despite having complete in-house control of our manufacturing operation, we found lookalikes being sold before we could get shipments out of our warehouse."

Totl Software has reported similar problems. Their **Flex File** data base management program, written by Michael Riley, was withdrawn from circulation after it was discovered that two companies were selling bootleg versions. Totl and Riley placed a great deal of faith in consumer honesty by offering listable software, but have now added protection to their products. "The decision took a year to make", a Totl spokesman says, "but our dealers reported that once a few (unprotected) programs were sold in an area, everyone had copies of them".

President Bernie Anderson of Magtech, Canada's largest independent trade duplication house, believes manufacturers assist piracy by placing too much emphasis on short term profit. "Nothing is 100 per cent secure, but modern duplication equipment can do numerous things to a customer's program which make copying difficult. The additional work adds between 12 and 35 cents per disk, but many companies select the low end of this range in an effort to save money."

This is not idle rhetoric. Epyx's **Jumpman**, a machine language game, sold about 50 thousand copies, but was circulated much more widely because it is



easy to get into. One sympathises with the writers' loss of royalties, but not with Epyx, who saved pennies using 'first line protection', and lost five million dollars worth of business by doing so. Although 80 per cent of software sales are made to new computer owners, who do not have the expertise to break into programs, and although less than one per cent will ultimately become fluent in machine language, these statistics cannot excuse pinch-penny attitudes. As Atari's John Boyle points out, "It takes only one person to crack software and, with modern communications, upload it to a database where hundreds can be circulated in a matter of hours".

If manufacturers are willing to spend money on protection, the size of the product and the market it's written for will influence what form the protection takes. Diskette and tape are both economical, and the protection can be written directly into the program. Joystick-driven games are mainly secured by 'killing' the keyboard, leaving no obvious way to enter commands. An interesting mechanical device called a 'dongle' or 'data lock key' provides another alternative. This device plugs into the joystick port, where its presence can be checked for by the program. The advantage of dongle protection, from the user's point of view, is that archive copies of the program itself can be freely made.

The original dongles were decipherable with a logic probe, but duplicating one wasn't easy. The trend now is towards more cheaply made dongles that look the same but are easier to copy. In any case, one source told me, "it's possible to alter the program and patch around the security. Most manufacturers make only one check for the dongle's presence, and this makes the alteration simple".

Whilst there is no justification for dishonesty, there are many reasons for backing up commercial software. Your 'licence to use' will obviously last longer than the medium it arrives on, and one day your favourite's not going to work. Most companies recognize this fact, and will provide additional copies for a nominal charge. Provided it's kept strictly as a backup, few manufacturers would object to you making your own. But copying is often done on a much wider scale.

Some time ago, I purchased a modem that refused to match up with my Microtechnic **Smart 64 + 2** disk. My complaint brought an offer of free software equal to my own, at which point the dealer commenced duplicating a name brand sample for my approval. A few weeks later I obtained a list of 400 programs being sold by a student. **Zaxxon** and **Kickman** were offered at five dollars, and dongle-free copies of **Oracle** and **Paperclip** were fifteen dollars each. These pirates are amateurish. The student offered photocopies of original manuals, and the dealer might have trouble with suppliers if his actions become known. Professionals choose methods where the ethics may be questionable, but seldom the legality. Current

copyright laws are not adequate to protect software, though documentation is less vulnerable.

International borders are exploited by the more knowledgeable pirates. Copies of **Word Star** are sold openly in Hong Kong, because copyright laws are not recognized there. Many of the advertised IBM and Apple Clone computers really are 100 per cent compatible, because the ROM chips have been duplicated in countries where copyright does not apply. It is difficult to get convictions when no laws have been broken.

Corporations law offers advantages to the dishonest. A claim for damages under the Copyright Act is a civil matter, and there would be no point in continuing one if an incorporated pirate dissolved his business. When MicroPro sought judgement against Data Force Corporation (to establish that **Word Star** was being sold under a different name), the defendant closed his business, leaving the plaintiff with costly legal expenses but no one to recover them from.

The Commercial Branch of the RCMP recognizes these weaknesses, and recently gained a conviction in Vancouver using the penal code instead. Anyone convicted in this manner could be given a ten year jail sentence, and closing one's business is not an out. However, this is still only a stopgap measure until more definitive laws can be enacted.

IBM is one of the few companies currently requiring dealers to obtain a signed usage agreement from the consumer at the point of sale. Many companies enclose restrictions inside the packaging, but a customer should know exactly what is being purchased before parting with money, and the validity of telling him later seems questionable. Even IBM's practice leaves one wondering how they could enforce contractual obligations if the purchaser were a minor. Assemblyman Gray Davis has introduced an act into the California Legislature that many Canadian manufacturers would like implemented here. Under this proposal, usage limitations would be clearly outlined on the software package; opening the pack would constitute acceptance of the terms. This 'shrink wrap law' covers a number of situations that are now vague, but it does not address the manufacturer's obligations to the consumer. This may be an area where user groups could make legitimate intercession on our behalf.

. . . Epyx saved pennies using 'first line protection', and lost five million dollars worth of business by doing so . . .

'Lookalikes' are another problem. The difference between a toad and a frog may be considerable to a naturalist, but the salesman who sold me my **Road Toad** game assured me that it was similar to the out of stock **Frogger**. If there is no actual crime in the similarity, and one accepts that both games are original work, then the question of ethics remains. As I see it, baseball is baseball, even if you print hockey on the tickets.

There are three kinds of people: a rare few who are creative; a large group who exploit what they produce; and the majority of us, who provide the financial incentive for both of them. Nobody enjoys working for nothing, and maybe pirates should pause and consider how little they would have if the creative stopped creating. □

OS/9 IS HERE

TPUG has implemented the popular 6809 operating system 'OS/9' on the SuperPET. Super-OS/9 greatly expands software availability and the hardware capabilities of this computer while at the same time preserving access to the Waterloo languages and programs.

The cost of Super-OS/9 to club members will be $195 (Cdn.), which will include the cost of a hardware modification that will not affect the normal operation of the SuperPET. Two board SuperPETs require a simple hardware modification — we provide instructions. To obtain your copy, send $195 (Cdn.) to: TPUG (101 Duncan Mill Rd., Suite G-7, Don Mills ON, M3B 1Z3, Canada).

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The *KEY* Command in *Simons' BASIC*

by Peter Moskos

Programmers using **Simons' BASIC** on the Commodore 64 will seize upon the **KEY** command immediately as a great time saver. However, several of the ways in which it can be used are not explained in the manual, and it takes some tinkering at the keyboard to discover its possibilities.

The **KEY** command is a programming aid to be used by the programmer as he *writes* the program, rather than by the program *user* as the program runs. The command allows the programmer to assign up to sixteen standard BASIC or **Simons' BASIC** commands to the four function keys at the right of the keyboard. For example, to assign **LIST** to the **F7** key, you simply enter:

```
KEY 7,"LIST"
```

and press **RETURN**. From this point on, you simply use **F7** and **RETURN** to list the program in memory. Thus the number (1 to 16) following the **KEY** command designates the function key being used, while the code between the quotation marks is the BASIC command (or commands) assigned to that key. The code between the quotation marks can be up to fifteen characters long and may include numbers, punctuation marks, signs (such a '$' or '#') or multiple commands. The sixteen different function keys are obtained by using the **SHIFT** key and the Commodore key, singly and in combination.

The need for pressing **RETURN** after the use of a function key can be eliminated by adding a carriage return (ASCII 13):

```
KEY 7,"LIST"+CHR$(13)
```

Enter this, and a carriage return following **LIST** is triggered automatically. A program can be listed instantly, with one keystroke, simply by pressing **F7**.

This much is described in the manual. Now let us see what else the **KEY** command can do.

Chaining CHR$s

The automatic carriage return described above suggests other possibilities in the use of the **KEY** command. Just as **CHR$(13)** can be added to a key assignment to eliminate the carriage return, so can other character strings be added to more fully define the assignment and eliminate further keystrokes. This is especially useful when the code that you wish to assign is greater than fifteen characters long, or when it contains a quotation mark, which would normally be taken by the computer as a closing of the assignment, rather than as a part of it. An example of the latter is the **DIR** command of **Simons' BASIC**. To list the disk directory you type **DIR"$ <RETURN>**. But an attempt to assign this to a function key in the following manner:

```
KEY 3,"DIR"$"+CHR$(13)
```

fails, because the second quote is taken as terminating the string. However, by chaining **CHR$(34)** and **CHR$(36)** the desired result can be achieved:

```
KEY 3,"DIR"+CHR$(34)+
 CHR$(36)+CHR$(13)
```

Storing Key Assignments

But how practical is all of this? Defining the function keys to any detailed extent may take several minutes. Is it worth the trouble of doing this, if the assignments have to be typed in again at the beginning of each programming session?

Fortunately, **KEY** assignments can be stored. Since the **KEY** command can be used in numbered program lines as well as in direct mode, a short key assignment program such as the following can be written. Also, like any other BASIC program, it can be saved on disk or tape.

This program gives four functions to each of the four function keys. Key one is assigned **RUN**, **NEW**, and printer access; key two gets disk operations; key three handles the **Simons' BASIC** programming aids; and key four is for listing programs. Using **NEW** (or loading another program into memory) erases the program listing but leaves the key assignments intact. The function keys as now defined can be used to write and edit the new program.

Notice that some assignments contain automatic carriage returns, while others do not. For example, the carriage return after **NEW** has been omitted, to allow for the sober second thought of pressing **RETURN** before erasing a program. (In **Simons' BASIC** this would never be a disaster in any case, since the program can be retrieved using the **OLD** command.) Similarly, the two versions of **LIST** (with and without the carriage return) provide for maximum flexibility with this frequently-used command. **F7** (**LIST <RETURN>**) allows for a one-keystroke listing of the whole program. **F8** (**LIST** *without* the carriage return) is for use when listing a single line or range of lines for editing: for example, **LIST 230-270**, where the line numbers must be entered before hitting **RETURN**.

Clearly, the assignments each programmer makes will depend on his interests, tastes and needs. Indeed, a number of different key assignment programs can be written for use while working on different types of programs or jobs: graphics, sound, sprites, disk file management and so on.

Whatever choices you make, the **KEY** command is bound to be one of the features of **Simons' BASIC** that you put to almost constant use. □

```
 1 KEY 1,"RUN"+CHR$(13)
 2 KEY 2,"NEW"
 3 KEY 9,"OPEN4,4:CMD4:"
 4 KEY 10,"CLOSE4"+CHR$(13)
 5 KEY 3,"DIR"+CHR$(34)+CHR$(36)+CHR$(13)
 6 KEY 4,"LOAD"+CHR$(34)
 7 KEY 11,"SAVE "+CHR$(34)+CHR$(48)+CHR$(58)
 8 KEY 12,",8"+CHR$(13)
 9 KEY 5,"DISPLAY"+CHR$(13)
10 KEY 6,"DUMP"+CHR$(13)
11 KEY 13,"AUTO 100,10"
12 KEY 14,"RENUMBER 100,10"
13 KEY 7,"LIST"+CHR$(13)
14 KEY 8,"LIST"
15 KEY 15,"PAGE 23"+CHR$(13)
16 KEY 16,"PAGE 0"+CHR$(13)
```

A Writer's Database

By Charles Lewis

As a freelance writer, I originally purchased my CBM 8032 to use as a word processor. Soon, however, I began to want even more. Why was I keeping my records on paper — why not use my computer to do it for me? But as I scanned the ads, I found a new problem; I simply had too much money tied up already to allow me to buy any more software.

So I learned how to program. After a while, I prepared a primitive database that allowed me to set up a series of files with twenty items in each. It wasn't perfect — in fact, paper records were really easier to use — but at least I was using my expensive computer. Still I wasn't satisfied. The reviews of the professional database programs that I couldn't afford showed me how much more I could be doing.

Suddenly I realized that I did have a database program, one that was even more powerful than some of the ones advertised; what is more, I'd had it all along. My word processor (**WordPro 4**) could also serve as a database! Unlike my own program (and many of the commercial programs), the length and number of my records would be unlimited — each could be as long or as short as I needed. Moreover, I could use my 'search' function to find any information I wanted, regardless of where it was located.

My initial project was a record of articles I had written. First I prepared a format. I decided to centre the title of each article, drop down two lines, and set up five columns. The first column would be the name of the magazine, the next two would be the date on which I mailed the query (asking if the magazine would be interested in the subject) and the response, and the last two would be the date on which I mailed the article and that response. Below this I could add any comments, such as the disk on which the article was saved, the amount I received when sold, magazines that were out of business, and so forth.

After setting up the format, I saved a format file with the headings. Now, whenever I prepare a new article, I call up the main file and move the cursor below the last line used. Then I recall the format file and insert the information in the blanks I provided. When I hear from a magazine or send an article out to a new market, I just move the cursor to the record for that article, type in the needed information, and resave the file.

Since I need permanent records for tax time, I also prepared a file called **Articles Sold**. When I receive a cheque, I call up the original file, indicate the amount received, and add it to my permanent file. Finally, I delete that record from the original. I take care of these housekeeping chores each time I begin a writing session, so it's actually easier than it would be with many database programs, and — since I only have to use one program — it's quicker.

I then set up an address file. I know there are tons of simple database programs (I've got a couple from TPUG myself), but a word processing file allows me to search for a specific magazine (even if I can remember only part of the title), a specific editor, or even a specific city (the latter comes in handy when I have an article that a local magazine might find useful). And to make matters even simpler, I can merge the address with a letter much quicker than I could type it.

I have also begun using my word processor for indexing. Like most writers (and computer enthusiasts), I have tons of magazine articles that I might want to find 'one day'. Before, I had to tear out the pages and find the correct file folder. If the article fit in more than one category, I had to make a cross-reference note. Now I simply prepare a form like the following:

```
Author:
Title:
Magazine:
Date:
Page:
Code:
```

By saving the format under one name and the magazine files themselves under different names, it's easy to merge the two and add the latest articles. With **WordPro 4** I can even set up blocks that will allow me to move directly to the blanks.

Not only do I save myself the cost of buying a commercial program, but I have more versatility than many of these would give me. I can search for the code, of course; but I can also look for a title (or even *part* of a title, if I can't remember the full name). I can see which articles I found for a specific date, or I can find an article when I know only its author. Thus I have the ability to find information and organize it for different purposes — just as I would with a database program.

I use the same techniques to create index cards. In fact, I can do everything with the material I have on *my* database than I can with the information I download from the Knowledge Index online database. I've even used a conversion program to change the sequential files I obtain from Knowledge Index and CompuServe into **WordPro** files; that saves the time I would normally spend retyping the material.

There are restrictions, of course. Most programs would prepare a list of just the items I want; my search function moves me through the document, but I can't print such a list. This only means I have to be more creative. I just find the items I want, transfer them to the beginning of the file, and erase the remainder of the file (though I don't change what I have on disk). I can then print out the new document and have exactly what I need.

Another drawback: I cannot prepare an alphabetical listing. I can, however, convert **WordPro** files to sequential files and use one of the sorting routines that are available in the public domain. I can then print out the results directly, or else convert back to **WordPro** for more precise formatting. Word processors that create sequential files wouldn't need the conversion steps, of course, and some even allow alphabetizing within the program.

Certainly the more expensive database programs are more powerful, and for many purposes they would be more efficient. For my uses, though, the ability to search for *anything* is a real advantage — one that many such programs just don't have — and I can format a printed result much more effectively. I also have the satisfaction of making a program do more than its original writer intended.

If you are considering a commercial program, therefore, you need to examine your needs carefully. Could a word processing program — and you can find several in the TPUG library — do what you need? If not, then the cost of **The Manager** and similar programs is justified. But you sure can't beat the price of my program — it's free! □

A Beginner's BBS Guide: Part Four

by Ian A. Wright

In the first three articles of this series, Ian Wright discussed some of the uses of bulletin boards, how to logon and read messages and bulletins, and how to up and download. Now he discusses the selection of hardware and software suitable for BBSing by answering some of the questions that come up at TPUG's communications group meetings.

What do I need to start — and how much will it cost?

To start telecommunicating you must a telephone. A bewildering variety of accessories vies for your money. Each has different features and prices vary accordingly. The chart given with this article provides selected information about some of the most popular Commodore-compatible modems and terminal programs.

Do I need an autodial/autoanswer modem?

This depends on the purposes to which your modem will be put. Are you going to be trying to access the local public BBSs, or will most of your telecommunicating be on Compuserve or Dow Jones? If you answered 'yes' to the first question, but 'no' to the second, you will be better served by a more expensive autodialling modem and supporting software, because it might take an hour of redialling to get through to a busy metro board — and they're getting busier all the time.

Do I need a special phone line?

No. The BBSs that we have talked about can operate well on a standard telephone line — as long as it is relatively noise-free. You can pay for a 'data-quality conditioned' telephone line (using a Datajack at $4.05/month extra), but first you must have a business telepone line! The costs are enormous. 'Voice-quality' lines need only be clear enough for speech, but you can do as I did and install a second phone line if you have trouble.

Should I buy a cheaper acoustic modem?

Only if you can't afford a direct-connect one. Playing your stereo in the same room where an acoustic modem is operating can produce really strange effects, like screen garbage and invalid commands. Few of today's telephones are designed for acoustic coupling, which means a lot of line-noise because of a poor fit. The $28 modem does work, but you must buy parts and hook it up yourself — see the December '84 issue of this magazine.

What's this 'parity' and 'stop-bits' stuff?

Until you become comfortable with BBSing, you can forget this stuff and let your terminal program do the work for you. When you try to communicate directly with a friend's computer, these considerations become more important. Parity checks for missing data, for instance, and you may in some situations have to set it correctly to ensure successful communications.

C-64 MODEMS

MODEL	MANUFACTURER	PRICE	A/A	A/D	C	COMMENTS
Pocket Modem	Bot Engineering	$150	Y	D	Y	Canadian made compact
28-dollar	Active Surplus	$ 40	N	A	N	incomplete kit
1600	Commodore	$ 80	N	D	N	comes with phone *
1650	"	$150	Y	D	Y	de-facto standard *
1660	"	$100	Y	D	N	includes speaker
MiniModem	EMP	$ 75	N	D	N	simple compact
Smartmodem	Hayes	$400	Y	D	N	needs interface
Hesmodem 1	H.E.S.	$125	N	D	N	C-64/VIC-20
Hesmodem 2	H.E.S.	$175	Y	D	N	
MightyMo	USI	$100	Y	D	N	3 year warranty
64/20	Westridge	$125	Y	D	Y	2 year warranty
Total Communications		$150	Y	D	Y	bundled software

A/A = Autodial/Autoanswer A/D = Acoustic/Direct connect Y = Yes C = Compatible with a 1650 autodial modem
* = discontinued/discounted Prices are in Canadian dollars

C-64 TERMINAL PROGRAMS

Name of program	Approx. Price	Buff	A/A	Protocols	Features supported: Meta	DF	Ed
Autodial/All	Free	N	Y	P1/T	N	N	N
Firstdial3	Free	42k	Y	P2/T	16	Y	Y
Hometerm	$50-75	11k	N	Xmod/T	Y	N	N
McTerm 64	$75-100	10k	Y	Xmod/T	Y	Y	
Pro-Term	$40-50	Y	Y	P1/Xon/.img/T	Y	Y	Y
Smart 64	$50-75	N	Y	P1/Xon/T	4	Y	N
TeleTalk	$40-45	42k	Y	P1/Xon/Xmod/T	8	Y	N
Terminal1650	Free	N	Y	P1/P2/T	N	N	N
Vidtex	$50-75	30k	N	Comp B/T	Y	Y	N
VIP Term	$50-75	7k	Y	P1/Xon/Xmod/.img/T	20	Y	Y
xCOM 64	$50-75	20k		P1/Xmod/T	Y		

A/A = Autodial/Autoanswer Buff = Capture buffer Meta = Programmable keys DF = Defaults file Ed = File editor
P1/P2 = Punter old/new T = text files Xmod = X-modem Xon = X/on X/off Comp B = Compuserve B .img = binary file

What is a 'defaults' file?

Most terminal programs are menu-driven — you make various selections from a list of options that the programmer has built into his terminal. Most good terminal programs allow you to set literally hundreds of variables, and if you had to do this each time you might go mad! A defaults file keeps a record of all your selections — your telephone numbers, user codes and so on — to be loaded in from disk. You can give your user code with one keypress, or even have a series of commands for automatic logon.

Which protocol should I get?

If you want to access a commercial database like CompuServe or Datapac, you should investigate their terminal programs or other commercial programs, because some databases need their own programs. Vidtex is one example. For up/downloading from TPUG or other Punter boards you will need either the new or old Punter protocol, depending on which board you are using. Generally, the new protocol is twice as fast, but only works on C-64 BBSs like TPUG's.

Can I talk to my friend's computer?

To most people, the idea of typing a message from computer to computer rather than speaking into the phone seems a bit weird — and it is! Direct transmission of data files or programs, however, makes a lot of sense. Two public domain programs available in the TPUG library are **64 to 64** and **Microterm 64**, both of which transmit files between machines using complicated error-checking routines to make sure that what was received matches what was sent.

What are the key features of a terminal program?

Again, this depends on your specific requirements, but here are a few major considerations:

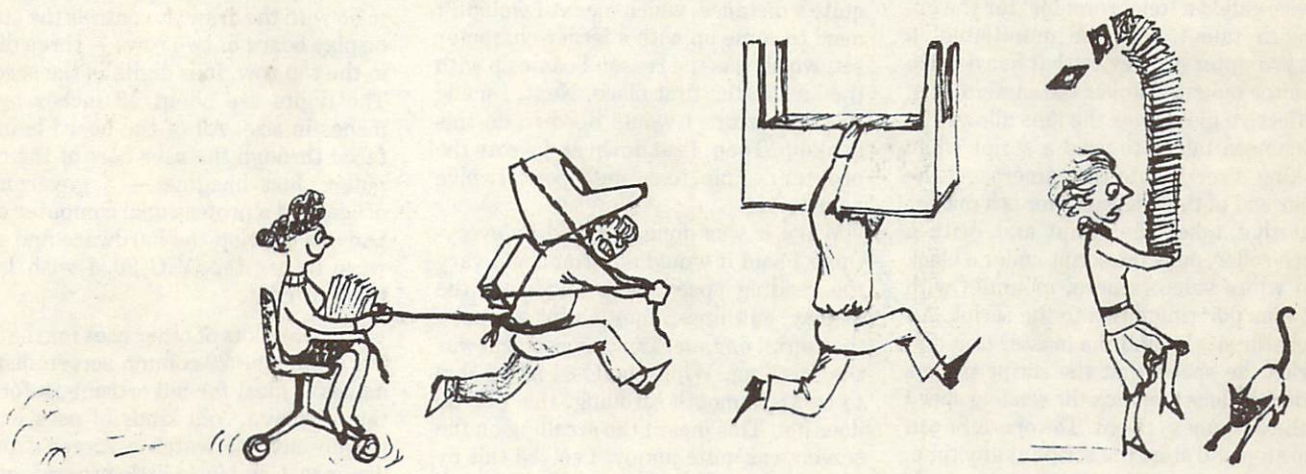
- Is it compatible with your modem? Try them out together in the store, or use various public domain programs until you know what to ask about.
- Does it have a buffer/printer function? When you need this feature, it's nice to have it immediately available.
- Does it have a defaults file? Until you have answered the same questions about parity and stop bits for the umpteenth time, this feature may seem like a frill. It's not.
- Will it up/download from the systems you will be on? There are many different protocols, so you may need more than one terminal program.
- Does it have meta-keys? Remembering codes and answering prompts with the correct responses is far easier with programmable keys.
- Does it offer a simple method of selecting screen colours, altering passwords, and so on? Many terminal programs that come with a particular modem have only a few options, and after a short time they become restrictive. This is the distinction between 'smart' and 'dumb' terminal programs.

Specific questions about the operation of a modem, terminal program or anything else about BBSs should be entered as messages to ALL on local systems. The replies will help many others who want to know, but are frightened to ask. Some local boards have instituted special bulletin sections to provide answers to frequently asked questions, and some BBSs have special message sections for this purpose. BBSers are very helpful to novices.

Over the last three years I have been amazed at the growth of telecommunications among home users, and I have been pleased to make a number of new friends through this medium. I invite other TPUG members to reach out over the telephone lines — it opens up a whole new world. □

Toronto PET Users Group Inc.

WE HAVE MOVED



Our new address...

101 Duncan Mill Road, Suite G7
Don Mills, Ontario M3B 1Z3
Telephone: (416) 445-4524

Making Money with a VIC 20

by Michael D. Curran

So you have a Commodore 64 now and your old VIC 20 is sitting on a shelf collecting dust. What should you do with it? Well — sell it (if you can), let the kids play with it, use it to make slates for your VCR, or... put it to work. That's right, put it to work! The VIC 20 has some unique features that could help you make some extra spending money. The most obvious feature is the screen display, which is the subject of this article.

To begin with, computers are an expensive hobby — rewarding, but expensive. Just ask my wife! I had a substantial investment in hardware for my VIC 20, as you can see from this list below:

VIC 20 and datasette: $300
32K Memory Expansion: $154
4-Slot Expansion Board: $79
40/80 Column Board: $100

This list does not include the price of my printer, monitor and disk drive, all of which I still use with my 64. Even so, it comes to a total of 633 dollars. But my VIC 20 has now earned all that back and paid for itself. How? Well I will tell you.

I am a technical director (switcher) for a television station in Montreal. I won't take your time by explaining exactly what my job entails. On one occasion, though, I was working on a show that used a device called a 'teleprompter' for the on-camera talent. For the uninitiated, a teleprompter is a device that has a video monitor mounted under the camera lens. Reflective glass over the lens allows the on-camera talent to read a script while looking directly into the camera. At the other end of the teleprompter is a master unit that takes the script and, with a pinch roller, pulls the script under a black and white video camera, mounted with the lens pointing down to the script. An operator sits behind the master unit and varies the speed that the script travels under the lens to match the reading speed of the on-camera talent. The operator can also stop and start the script at any time.

The script itself must be typed on letter-sized paper, using the right hand 25 columns. The sheets of paper are taped together to be fed through the master unit. As you can imagine, the script for a half-hour show can be quite a long roll of paper. Of course, with that many pieces of paper taped together, sometimes the master unit will jam as the script passes through, which can cause quite a mess.

We have two pairs of monitors and screens, but only one master unit. This causes scheduling problems, as only one show can use the teleprompter at a time. On this occasion, the show I was working on was waiting for its turn at the teleprompter, and the show that was using it was running late. This made the director I was working with 'slightly annoyed'. He couldn't run late, because the News was coming out of our control room, and the News is live and never starts late.

After asking why we didn't have a second unit, I was told rather crisply that a second unit was ordered but wouldn't arrive until after Christmas. As this was just the end of October, I could understand his frustration. Then I had an idea. I told him I could come up with a solution, just to tide him over until the new unit arrived. I thought he was going to kiss me! I quickly stepped back.

So I began. First, I knew that the video of the VIC 20 was baseband video, which is a standard that all broadcast monitors use. This meant I could hook up my VIC to the teleprompter monitor with no problems. I also knew that the 22 column display was large enough to be seen at quite a distance, which meant I wouldn't need to come up with a larger character set, which was the reason I came up with the idea in the first place. Next, I made the connectors I would need to do this hook-up. Then, I sat down and wrote the program. This took me about twelve hours.

When it was done, it could do everything I said it would do. You could vary the reading speed, stop and start the display, edit lines, input script and save that script on tape. The only problem was the scrolling. While the C-64 has a chip to control smooth scrolling, the VIC 20 does not. This meant the scrolling on the screen was quite jumpy. I solved this by leaving more room on the screen between lines. Next I gave the director a demonstration of how it worked. His first comment was, "It's so clear!".

You see, the very nature of the teleprompter (a lens shooting typed text on white paper) conspires to produce a rather murky video image. Of course, the computer's output is very sharp and clear. Needless to say, he loved it and agreed to my price right away. Next, I had to write a user manual and make sure the program itself was 'idiot proof' — not an easy task. Those of us computer enthusiasts who have been at this for a while tend to take a great deal for granted. In the user manual, *everything* has to be explained. What is a cursor? When do you press **RETURN**? Obvious things like this all have to be explained. Next, the program has to be written so that obvious mistakes can't be made or, if they are, the user ends up someplace safe where he can start over again with no damage to his data. A big job! This took time, and many tests.

Of course, the job finally was done, or I wouldn't be writing this article. The VIC 20 and my program have been performing flawlessly from the start. By the way, I am writing this article in February, and my VIC 20 is still being leased almost every week. The master unit is supposed to be in *any day now*, since December.

This is just one example of a profitable use for a VIC 20. At the television station where I work we also do the daily LOTO draws. Guess what they use to control their display board? That's right — a VIC 20! Of course the VIC has nothing to do with the draw. It controls the studio display board of two rows — three digits in the top row, four digits in the second. The digits are about 12 inches by 18 inches in size. All of the board is interfaced through the user port of the computer. Just imagine — a government office paid a professional computer company to develop the hardware and software to use this VIC 20. I wish I had thought of it.

There are lots of other uses for the VIC 20. Its unique 22-column screen display makes it ideal for advertising, information display... all kinds of uses where people have to watch a screen from a distance. Combine a little programming, some technical knowledge and some imagination, and you could probably come up with something.

Now I just have to think of a way to get my C-64 to pay for itself! □

Programmable Characters

by Steven Darnold

The Commodore 64 has a wide variety of graphics modes. You can use PET graphics, sprites, multicolour sprites, a bit map, a multi-colour bit map, programmable characters, multicolour programmable characters, or extended background colours. You can also use combinations of these modes. This rich selection of modes permits the 64 to produce extremely sophisticated graphics. However, there is a lot to learn before you can make full use of the 64's capabilities. Programmable character definition is a good place to start.

When I am writing a program, I often find that I need a character that does not appear on the keyboard. For example, I was once working on an educational program to teach angles and I needed a degree sign. However, since I was using a PET, I had no way of producing one. The Commodore 64, on the other hand, is quite capable of producing a degree sign, or any other character that can be defined in an 8 by 8 block of dots.

The key to programmable characters on the Commodore 64 lies in the fact that any of its 256 characters can be redesigned. This means that you can change the spade sign (for example) into a degree sign. Then every time you hit **SHIFT-A**, you get a degree sign on the screen. **PRINT**ing a **SHIFT-A**, or **POKE**ing the number 65 to a screen location, will also produce the degree sign. Before you can redesign characters, though, you have to put your 64 into the right frame of mind.

First, reset your 64 and remove any cartridges. Then type:

```
PRINT CHR$(142): CHR$(8)
```

This locks the computer into the upper-case/graphics character set. The lower-case/upper-case character set can also be redesigned, but it makes this discussion easier if we avoid switching character sets. Push the shift key and the Commodore key simultaneously, and you'll see that no switching occurs. Next, type:

```
POKE792,116:POKE793,164
```

This alters the warm start routine to keep it from destroying the new characters we are going to build. Press **RUN-STOP/RESTORE** a few times. You should get a READY without the screen being cleared. Now, type:

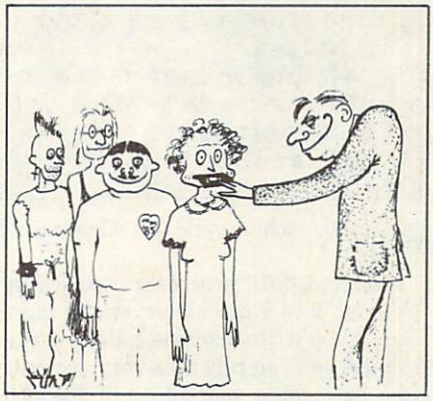
```
POKE 56,127: CLR
```

This lowers the top of memory to give us some RAM to use. Enter **PRINT FRE(0)** — the result should be 30461. If it isn't, then you probably forgot to enter **CLR**.

The next bit is the most difficult, so be careful. At present the character set is stored in ROM. In order to redesign the characters, we have to shift them to RAM. There are five steps: disable the interrupt, connect the ROM, transfer the characters, disconnect the ROM, and re-enable the interrupt. This must be done as one operation, since the keyboard will not respond between the disabling and the re-enabling of the interrupt. Enter the following line to set up a couple of key variables:

```
A=40960: B=53248
```

Now, enter all of the following before pressing **RETURN**:



```
POKE56334,0:POKE1,51:
 FORI=0TO2047:POKEA+I,
 PEEK(B+I):NEXT:POKE1,
 55:POKE56334,1
```

This will take about fifteen seconds to execute.

You now have a copy of the character set in RAM, but the computer is still using the set in ROM. The final step is to tell the computer to use the new character set:

```
POKE 56576,149: POKE
 53272,8: POKE 648,128
```

Since the screen must be in the same block of memory as the character set, it shifts at the same time. The screen now starts at 32768 (just like the PET) and the character set starts at 40960.

Clear the screen and type ABC. The characters should look normal (if not, you have a problem). Now enter **POKE 40971,0**. Look at the A in ABC, look at the A in READY. The zero you put in 40971 wiped out the fourth line of the A. Try putting zeroes in 40972 and 40973. What happens? See if you can make all of the A disappear. Now enter **POKE 40976,0**. Can you make all of the B disappear? Can you make the C disappear, too?

Each character is made up of eight lines, and each line is stored in a separate memory location. If the contents of a memory location is zero, then the corresponding line is blank. If the contents is 255, then the line is solid (try putting 255 into 40968). Different numbers between 0 and 255 give different types of lines. This is based on the binary representation of the number. A value of 255 gives a solid line because in binary it is 11111111. Similarly, a value of 0 is represented as 00000000. Each binary digit corresponds to a dot on the line. If the digit is 1, the dot is lit; if the digit is 0, the dot is off. Thus, if you want the left half of a line to be lit, the number to poke is 240 (11110000). Experiment with different numbers. See pages 77-78 in the *Commodore 64 User's Guide* for details.

The character images are arranged in order, with each character taking 8 bytes. If you want to know where a particular character starts, use this formula: screen display code times 8 plus 40960. The screen display codes are listed on pages 132-134 of the *User's Guide*. Codes for the reverse field letters run from 128 to 255. Thus, although we have mangled A, B, C (codes 1, 2, 3), we have not touched their reverse field representations (codes 129, 130, 131). Check this by pressing **CTRL/RVS ON** and typing ABC.

Now we are ready to turn the spade sign into a degree sign. First look up the code for spade (65), multiply it by 8 (520) and add 40960 (41480). This gives us the first line of the spade. Poke 120 (01111000) into 41480 and 41483. Poke 204 (11001100) into 41481 and 41482. Poke 0 into the bottom three lines (41484 to 41486). Now press **SHIFT-A** for a lovely degree sign.

That's all there is to it. Now you can design your own characters. You'll have to spend a bit of time with an 8 by 8 grid working out the numbers, but once you get used to it, it isn't too difficult. □

System Clock Frequencies

by James C. Halsey

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Have you tried using a modem software package that supposedly supports upload and download, but you cannot seem to make it work correctly, even with a receiving computer that does support these features? Or perhaps an RS-232 device connected to the RS-232 port, that strays from normal operations, on the Commodore 64? If so, you may want to run the short program in the box on this page. It is a *very* simple benchmark-type program, designed to give your computer a chance to continuously run for about two minutes. The number printed when the program finishes is the number of *jiffies* (sixtieths of a second) that elapsed during the run time. The correct jiffy counts are listed in the table with this article for each Commodore computer on which I have run the program. Before running the program, clear the screen (direct mode), then type **RUN** and tap the **RETURN** key. The word **RUN** in the top left corner should be all you see on the screen until the program finishes. Run the program at least three times to check the reproducibility of the result.

If you are a Commodore 64 owner you will also have to determine which ROM you have in your machine. To do this, start with your machine newly turned on. Clear the screen, move the cursor down two rows, then type **POKE 1024,65** (and press **RETURN**). The character in the top left corner of the screen should be a white, graphics spade character for type 1 ROMs, a blank for type 2 ROMs (if you home the cursor you'll see the spade blinking), and a spade in the cursor colour for type 3 ROMs (and SX-64s).

I began investigating the question of clock frequencies when our local sysop told me that people with Commodore 64's and VIC 20's were having problems using the upload and download features available from the BBS software. After an investigation, it became apparent the system clocks in these two computers are adjustable. This design feature allows you to compensate for differences from machine to machine, due to parts tolerances, which affect the processor clock speed.

Much modem software is written using the system clock (hardware interrupt) as a timer for setting the software UART (universal asynchronous receiver transmitter) necessary for transmitting to a modem, whether it be an IEEE-488, RS-232 or user port RS-232 connected. The earlier PET computers used a 1 MHZ (megahertz) system clock. It seems the 'standard' then for setting up the baud rate for modem transfers used a reference of the 1 MHZ system clock. This meant the processor clock speed

```
100 rem benchmark
110 t=ti
120 for i=0 to 2000
130 a=1
140 b=sin(a)
150 c=cos(b)
160 next i
170 print ti-t
```

gave each machine cycle one microsecond duration.

6502 and 6510 processor instructions are from 2 to 7 machine cycles in duration. If you write machine code to use as a timer, you can rely on a very accurate time base for a subroutine (if the processor clock frequency is accurate), from the fact that machine instructions take a set number of machine cycles to execute. Most terminal and BBS programs have used this concept, without considering that a system clock may have been adjusted incorrectly, or may have varied from original settings. Some programs making use of the built-in RS-232 port in the VIC 20 and Commodore 64 may be experiencing the same difficulty. These computers use a clock frequency of 1.022728 MHZ derived from a 14.31818 MHZ master clock.

Even with an improperly adjusted clock frequency, you may at times be able to use modem-oriented programs with no difficulty. This depends on the tolerance levels for the modem parts, the telephone lines, and the receiving computer and its modem, as well as the software. Should you be experiencing difficulty with terminal programs, you can check your system clock by running the test program *exactly* as it's printed here (additional spaces or fewer spaces will make your program execute with different times than those specified). Also, be certain to load and start the program with a newly turned on machine, as some programs and utilities will affect the timing. If the jiffy count of your computer is not close to that listed (the closer it is, the more reliable your use of terminal programs and peripherals), you may want to have a qualified service centre set your system clock frequency with an accurate frequency counter.

The results listed in the table for Commodore 64 and VIC 20 were obtained using machines whose clocks had been adjusted to the exact frequency of 14.31818 MHZ using the NTSC jumpers as listed in the respective reference guides. The PET series master clocks are not adjustable, and thus would require component changes to adjust the frequency.

Transmitting at 300 baud, we're required to send one bit every 3333 usec, if we're using 1 start bit, 7 data bits, and 2 stop bits, with no parity, for a total of ten bits per character. This translates to sending one complete character every 33,330 usec, or 33,330 milliseconds to send 1000 characters — one full, 40 column screen, or approximately 4 blocks of code. Now, if we have a processor clock frequency of 1.022728 MHZ with an error rate of .02 per cent, our clock will be off by 204 HZ. The error factor of .02 per cent accounts for a 6666 usec difference. This is 20 per cent of one character time (two single-bit times), which means that our data transmitted or received is one bit off after 500 characters, and one half bit after only 250 characters. So you can see where the data transfers are very likely to be faulty, without taking into account tolerances elsewhere in the transmission process. □

Model	Jiffy count	Clock Frequency (MHZ)
Commodore 64 (01 rom)	7166 ± 1 jiffy	1.022728
Commodore 64 (02 rom)	7005 ± 1 jiffy	1.022728
Commodore 64 (03 rom)	7005 ± 1 jiffy	1.022728
SX-64 (04 rom)	7005 ± 1 jiffy	1.022728
VIC 20	6558 ± 1 jiffy	1.022728
CBM 8032	7294 ± 1 jiffy	1.000152
2001/Execom	7299 ± 1 jiffy	1.000063

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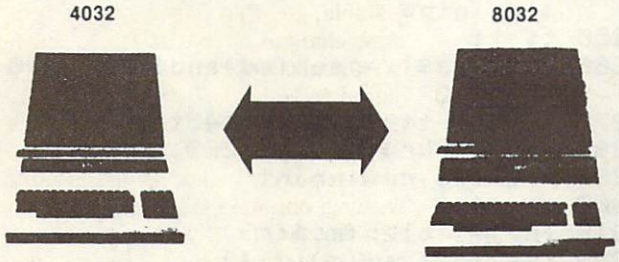

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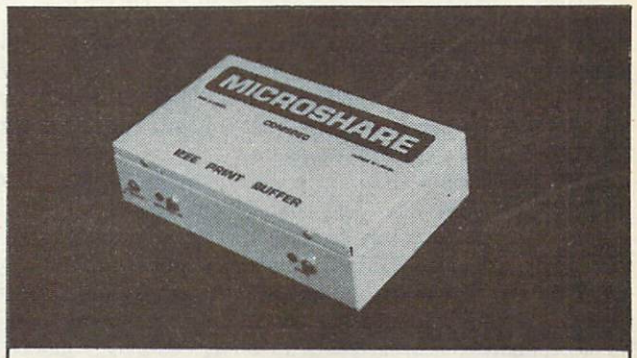

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Micro Processes

Micro-Memo

Ron Byers

The program below, used in conjunction with the 1650 Automodem, can easily turn your VIC 20 or Commodore 64 into a host computer for a very simple bulletin board.

Micro-memo will run as is on either computer, since it takes a 'peek' to see where it is before it does anything it would be sorry for, and adjusts its memory locations accordingly.

On the unexpanded VIC, the memo sent to the caller will be very short, but it may serve your purposes as it does mine. I have been operating a BBS three days a week for several months. In a small town in Nova Scotia with another similar system also on line three or four days a week, this serves the need quite adequately. However, I wanted my callers not to feel completely rejected when they call during off hours, so my VIC 20 was pressed into service to handle the chore of answering the phone and greeting callers with a little message regarding the bulletin board schedule. It works great, is cheap, easy to use, and virtually crash proof (as long as the power stays on), and can be left on for long periods of time if the regular bulletin board or the sysop needs a holiday.

It occurs to me that this program, particularly when used on an expanded VIC 20 or on a Commodore 64, could have a host of other uses. For example, it could be put on the phone line of a computer store after hours to present information on the latest sales or bargains, and for announcements of general interest, such as club notices. It could similarly be used on school phones at night by the computer club, so that students could post notices and experiment as junior sysops.

Everything you wish to say in your memo is entered as **DATA** statements. Make them less than 39 characters long for best readability (21 characters on the VIC), and be sure that the last statement is **DATA "XX"**. Dimension the *MS$* array (line 30) for more than 50 if you wish to have longer messages — provided you have enough memory in your computer. Since the program is short, many copies, each with different messages, could be saved under different filenames on one tape or disk.

If you find that you are not already contributing until it hurts to Ma Bell or Maritime Tel. (or whatever), give a call to the Microblackboard, now that you have the schedule in the **DATA** statements in the **Micro-memo** program. □

```
10 open5,2,3,chr$(38)+chr$(160):print
   chr$(14):printchr$(8)
20 ifpeek(59271)=208thenmach=64:md=56
   577:c1=0:n=0
30 ifpeek(59271)=232thenmach=20:md=37
   136:dimt%(255),ms$(50)
40 cr$=chr$(13)+chr$(10):printchr$(14
   7):print:print
50 n=n+1:readn$:ms$(n)=n$:rem
   <3 spaces>*<7 spaces>micro-memo
   <7 spaces>*
60 ifn$<>"xx"then50:rem<9 spaces>*
   <3 spaces>r.e. byers - may'85
   <2 spaces>*
70 n=n-1:rem<20 spaces>*<7 spaces>tru
   ro, n.s.<6 spaces>*
80 forj=0to255:t%(j)=0:next:rem *
   <2 spaces>bbs # is 902-893-8742 *
90 forj=32to64:t%(j)=j:next:t%(13)=13
   :t%(20)=8:t%(160)=32
100 forj=65to90:t%(j)=j+32:next:forj=
   91to95:t%(j)=j:next
110 forj=193to218:t%(j)=j-128:next
120 forj=0to255:x=t%(j):next
130 pokemd+2,32:pokemd,0:c1=c1+1:m=0
140 printc$:printchr$(147):print:
   print"Waiting for call #";c1
150 print:print"Set modem to Data and
   <space>Answer."
160 pokemd,0:x=peek(md)and8
170 ifx<>0then160
180 pokemd+2,0:pokemd,32
190 print:print"Phone Answered!":
   print:print"Waiting for carrier."
   :ct=0
200 x=peek(md)and16:ifx=0thenpokemd,0
   :goto230
210 ifct>300thenprint"Disconnected":
   goto130
220 ct=ct+1:goto200
230 fori=1to 500:nexti
240 p$="hit return":print#5,cr$;cr$;p
   $:printp$
250 tt=ti
260 get#5,a$:x=peek(md)and16:ifx<>0
   then130
270 te=(ti-tt)/60:ifte>45then130
280 ifa$<>chr$(13)then260
290 print#5,cr$:print
300 m=m+1
310 forj=1tolen(ms$(m))
320 t$=mid$(ms$(m),j,1)
330 printt$;:print#5,chr$(t%(asc(t$))
   );:nextj
340 get#5,a$:ifa$<>""thenfori=1to9000
   :nexti
350 print#5,cr$:print:ifm<nthen300
360 fori=1to16000:nexti:goto130
370 data"<10 spaces>"
380 data"=#=#=#=#=#=#=#=#=#=#=#=#=#=#
   =#=#=#=#=#="
390 data" "
400 data"( Press RETURN for 10 sec. p
   ause )"
410 data" "
420 data"You have dialed the correct
   <space>number for"
```

```
430 data"the MICROBLACKBOARD Bulletin
    <space>Board."
440 data"Unfortunately, the regular B
    BS is not"
450 data"on at the moment.This is jus
    t a short"
460 data"message to invite you to cal
    l back at"
470 data"another time. The BBS now op
    erates"
480 data"according to the following s
    chedule:"
490 data"<2 spaces>"
500 data"Tuesday, Friday, and Saturda
    y -"
510 data"12:30 noon until 12:30 at ni
    ght."
520 data"<2 spaces>"
530 data"It will also usually be avai
    lable"
540 data"on Sunday evenings."
550 data"<2 spaces>"
560 data"Thanks for your interest. Pl
    ease"
570 data"come back again!"
580 data"For further information, cal
    l"
590 data"902-895-8846 on the voice ph
    one."
600 data"<2 spaces>"
610 data"PLEASE DISCONNECT."
620 data"xx"
```

The Software Jungle

J. Allan Farquharson

Would you run an uncopyable commercial program on your Commodore 64? If you do, you play Russian roulette each time you use the system. Ultimately, the disk gets corrupted and refuses to play silly games. Now you have a problem: the system crashes! Send the disk and proof of purchase to the manufacturer and they will send you a new copy for 'a nominal fee'. In a month or two you will be back in business. I wouldn't want to get myself in that situation with any program on which I depend for one penny of my livelihood. Would you?

As a software developer, I hate pirates. These are folks that enjoy putting the developer, his staff (including the programmer) and the dealer out of business. The usual excuse is: "But we wouldn't buy the program anyway!" If you have taken merchandise off the shelf without paying for it, telling the judge you wouldn't have bought it anyway is surely an outrageous argument. As laws are changed in various countries, severe penalties will be legislated for these same offenders. In a word: they are thieves!

The fact of piracy notwithstanding, my firm policy is this: *Never buy any program that cannot be backed up, or for which the supplier won't give you back-up copies at the point of sale.* If we all do this, those programs will soon die. When a good program sells for 49 dollars and is meant for business, surely the temptation to pirate is less, the reason to buy is greater.

Another rule: *When no manufacturer's address is on the box or manual, do not buy the program.* No one should be ashamed of his product!

A final rule: *If the documentation is poor, don't buy the program.* No one should have to struggle with bad documentation in order to use a program.

I have many commercial programs that are protected by 'dongles' and ROM chips. They are a pain but at least they allow backups — until the dongle or ROM chips fail to work because they wear out the socket.

I would love to hear from folks who find good commercial software for any Commodore computer that will allow backups. Perhaps we could publish a list at a later date. For those brave souls who trust their luck and operate a system on non-backup disks, be forewarned: You will become a follower of mine, sooner or later. □

Spooling on the B128

Elizabeth Deal

Long ago in *COMPUTE!*, T.M. Patterson showed how to spool files from disk to printer on the PET. Here is a version for the B128 machine and a CBM IEEE (4023) printer. I do not know if non-IEEE printers will work. The program is not in BASIC, as I was unable to convert the PET method directly. But the logic is the same: set up the disk as a talker, the printer as a listener, and disconnect.

Spooling is a very useful thing: printers are notoriously slow. When they print, you can't do anything else. Spooling permits you to use the computer while the printer and disk are talking to each other. The only thing you cannot do is try to use the printer or the disk while spooling is in progress, as this aborts spooling. In fact, this is how we quit early — by accessing the disk.

To use the program, type everything up to line 230 and run it. The program pokes some machine code into bank 15. Any time you plan to spool files, load and run this program, with the exception of line 260. Then load any program you wish to play with. When all is ready you can begin spooling using the **OPEN . . . SYS** command in line 260.

Superscript files that have been output to disk using the 'S' command can be so spooled. In fact, this was a key reason why I wrote this spooler. **Superscript** has a 'background' printing command, but it does not seem to work very well — you can only type when the printer prints carriage returns, and the spooling is tediously slow. The program shown below spools at the printer's speed.

Is spooling limited to word processing files? No, any sequential file can be spooled, including programs listed to disk as ASCII files.

Incidentally, people often ask if there is a way to bring programs into word processing systems. Yes, just make an ASCII file like this:

```
OPEN 1,8,3,"0:listing,s,w":CMD 1:LIST
```

When the cursor comes back, enter:

```
PRINT#1:CLOSE1
```

at which point you have a sequential file. It can be entered into most word processors, and it can be spooled to a printer or sent over the telephone. If the listing was made on the PET with BASIC 1 or 2 (upgrade), there will be line-feed characters at the beginning of every line. **Superscript** does not ignore line-feed characters, so you will have to delete the entire column of j's before you can work on such files. □

```
100 rem save"0:spool b128",8:rem
    <4 spaces>elizabeth deal
110 :
120 rem line 260 spools seq files, al
    lowing full use of computer,
130 rem except ieee. use for prg-list
    ings, wordpro/superscript s-files
    .
140 rem bus use or Key 1 aborts spool
    ing and/or closes the files.
150 rem based on idea of t.m. paterso
    n for the pet.
160 :
170 Key 1,"open15,8,15:close15:rem qu
    it spool
180 data 32,174,255,173,0,222,41,247,
    141,0,222,165,159,32,180,255
190 data 165,160,32,150,255,169,4,32,
    177,255,173,0,222,9,8,141
200 data 0,222,169,0,133,161,141,96,3
    ,96
210 bank 15:ad=680:rem machine code a
    t $f02a8
220 for j=0 to 41:read v:poke ad+j,v:
    s=(s+v*j)and 255:next j
230 if s<>235 then stop:oooops!
240 :
250 rem once mc is set up, this can b
    e used in direct mode
260 open 1,8,3,"1:spool*,s,r":bank 15
    :sys 680:end
270 :
280 :
290 rem disassembly. code can be plac
    ed anywhere in bank 15
300 :
310 f0400 20 ae ff     jsr $ffae
    ;unlisten the bus
320 f0403 ad 00 de     lda $de00
    ;atn true to send orders
330 f0406 29 f7        and #$f7
340 f0408 8d 00 de     sta $de00
350 f040b a5 9f        lda $9f
    ;tell disk to talk
360 f040d 20 b4 ff     jsr $ffb4
370 f0410 a5 a0        lda $a0
380 f0412 20 96 ff     jsr $ff96
390 f0415 a9 04        lda #$04
    ;tell printer dev#4 to listen
400 f0417 20 b1 ff     jsr $ffb1
410 f041a ad 00 de     lda $de00
    ;atn false to end commands.
420 f041d 09 08        ora #$08
    ;now disk can send bytes
430 f041f 8d 00 de     sta $de00
    ;to the printer.
440 f0422 a9 00        lda #$00
    ;make the computer normal -
450 f0424 85 a1        sta $a1
    ;keyboard standard input
460 f0426 8d 60 03     sta $0360
    ;no open files
470 f0429 60           rts
480 rem------------------------------
```

Keeping Victor Vibrant

Howard M. Mesick

Some people think that, like the TRS-80 Model 1, the VIC 20 is now suitable only for use as a boat anchor. Well, I've got news for them. Unlike the original Radio Shack home computer, the VIC 20 isn't heavy enough.

Kidding aside, there's still a lot of life — and support! — for a home computer that has sold millions of copies worldwide.

Many companies dropped their hardware and software for poor Victor the moment its discontinuance was announced, yet it pays to shop around because some stores still have tons of stuff, often at close-out prices. Stereo Discounter's mail-order catalogues (6730 Santa Barbara Court, Baltimore, MD 21227) have offered VIC programs at fabulous prices. If you live in the US, you might try calling them on their toll-free order number, 1-800-638-3920. The large K-B Toy and Hobby chain is also receiving much VIC software and selling it (mostly games, but some word processors, machine language monitors, and so on) for three to ten dollars (US). I have visited about three stores in Pennsylvania and Delaware and found about a four-foot shelf of software in each.

In its dying gasp, the defunct National VIC 20 User's Group "*strongly* recommended" a program from *AHOY!* magazine that gives a 40 column screen and PET compatibility to the VIC. It also reportedly runs any C-64 BASIC programs that do not have incompatible pokes or colour commands. I have not tried it because it eats 8K, and I don't need it. According to NVUG, a disk (tape also available) costs $8.95 (US), cheque payable to Double L Software, Ion International, Inc., 45 West 34th Street, Suite 407, New York, NY 10001. Any intrepid VIC user want to try it?

Regarding hardware compatibility with future Commodore peripherals, who knows? **SYS 64490**, as I wrote in an earlier issue, slows down the serial port so that some 1526/802 printers work when they otherwise would stop at the end of a line. My latest experience, and that of others, indicates that use of tape I/O sometimes resets the port to VIC speed, bringing back the problem. I don't know of any other difficulties. **SYS 64490**, therefore, might be useful on any future Commodore disk drives or printers that don't like VIC's faster processing speed. Try *extensively* those applications most critical to you before you buy.

With over a million units out there somewhere, VIC is far from dead. You've only got to look a little harder to find what you need. □

Directory Subroutine

M. Garamszeghy

Many BASIC programs make use of disk data files to store everything from mailing lists to expense data. In many of these programs, it is very useful to display the disk directory, especially just before being prompted to enter the name of a data file to be read. Seeing a list of data files on the screen will eliminate much of the guesswork associated with deciding which data file you want to read and the exact spelling of the filename. (Nothing is more exasperating than to enter what you thought was a perfectly legitimate filename only to find the little red error light flashing on the disk drive.)

Some versions of BASIC have a command (such as **FILES** on the IBM-PC) which will read and display the disk directory from within a BASIC program. Unfortunately, this feature is not implemented on the version of Commodore BASIC used on the VIC 20 and the Commodore 64.

Directory is a handy subroutine to read and display the disk directory without overlaying the current program memory. It can be included in any Commodore BASIC program. A simple **GOSUB 50000** statement in the main program will clear the screen and display the disk directory. In order to fit as many entries as possible on the screen, the directory will be displayed as a continuous string, with the entries separated by a slash (/).

The subroutine can easily be customized to display only certain entries in the directory by including a conditional statement in line 50120. For example, if the data files used by a given program all had similar names such as **Data1**, **Data2**, **Data3**, and so on, line 50120 could read:

```
50120 IF LEFT$(X$,4)="DATA"THEN PRINT
      X$+"/";
```

The subroutine would then only display the names of datafiles that were relevant to the program, avoiding screen clutter.

Using this principle, one can 'encode' filenames so that they can only be read by certain programs. One way to do this is to include a non-printing ASCII control character in the filename, such as **CHR$(7)**. For example, your program will probably include a line similar to:

```
100 INPUT"ENTER FILENAME";F$
```

To 'encode' this name, the following statement can be added to your program:

```
101 F$=CHR$(7)+F$
```

In this example, changing line 50120 of the **Directory** subroutine to:

```
50120 IF ASC(X$)=7 THEN PRINT X$+"/";
```

will produce a selective listing of the relevant datafiles. Since **CHR$(7)** is a non-printing character, it will not be displayed by the **Directory** subroutine. In addition, since it is not easy to enter **CHR$(7)** directly from the keyboard, this file cannot be accessed by any program that does not include a line similar to line 101 used above.

By using different control codes for each of your programs, you can always be sure of which datafile goes with which program. Some caution is required when using certain control characters for this purpose. For example, **CHR$(5)** will change the letter colour to white on the screen display, which may not be what you want; **CHR$(13)** will produce an inadvertent carriage return; and **CHR$(14)** will cause the display to mysteriously switch to the uppercase/lowercase character set. Even these control codes can be used, however, if due consideration is given to the effect that they will have when the filename is printed either to the screen or to a printer. Some control codes affect different printers in different ways, adding to the confusion. It is also interesting to note that most control characters will appear on the normal disk directory listing (the one you get with **LOAD"$",8:LIST**) as inverse video characters. This immediately identifies them as datafiles belonging to a given program.

Directory is written entirely in Commodore BASIC 2, and will run without modification on any Commodore computer and disk drive using the 1541 disk format. Adding this simple routine to your programs won't save you a lot of grief when you are trying to remember which data file contains your great aunt Betty's address, but at least it will display the choices to you on the screen. □

```
50000 print"<clr>":open1,8,0,"$0":rem
      <space>directory subroutine by
      <space>m. garamszeghy
50010 k1=0:get#1,a$,a$
50020 get#1,a$,a$,a$,b$:x$="":c=0
50030 ifa$<>""thenc=asc(a$)
50040 ifb$<>""thenc=c+asc(b$)*256
50050 get#1,b$:ifst<>0then50140
50060 ifb$<>chr$(34)then50050
50070 get#1,b$:ifb$<>chr$(34)andb$<>
      chr$(160)thenx$=x$+b$:goto50070
50080 ifk1=1thenx$=x$+"*"
50090 get#1,b$:ifb$=chr$(32)orb$=chr$
      (160)then50090
50100 x$=x$+b$:get#1,b$:ifb$<>""then5
      0100
50110 ifk1=0thenprint"<rvs>";:k1=1
50120 printx$"/<off>";
50130 ifst=0then50020
50140 x$=chr$(13)+str$(c)+"<2 spaces>
      blocks free":printx$
50150 close1:return
```

RECHARGER NOTICE

Please note that the contest closing date given in our centre insert has been extended to September 30, 1985, for TPUG members only.

Please make certain the word TPUG appears on your entry.

Thanks.

Library Additions

TPUG's library of public domain software grows month by month. Hundreds of disks containing thousands of programs are available to TPUG members at the nominal cost of ten dollars per disk. Considering that each disk is packed with good programs, at today's software prices, this is a fantastic value.

In order for the library to keep growing, our librarians need a constant supply of new programs. If you have written a program or a collection of programs that you think might be an asset to the library, please send it to: TPUG Program Library, 101 Duncan Mill Road, Suite G7, Don Mills, Ontario M3B 1Z3, Canada. ***Please note: this is our new address.*** *If your contribution is accepted, you will be sent the library disk of your choice. If, for some reason, your contribution is not needed, your original disk will be returned to you.*

On these pages our librarians describe recent additions to the library.

Note: Descriptions for new Commodore 64 disks were unfortunately not available in time for this issue. Regular coverage of Commodore 64 disks will resume next month.

VIC 20 Disk (V)TJ

Presented by Richard Best

I'm excited about this disk for both the quality and variety of programs contained on it. There are some excellent games for all age groups, a few 'productivity' programs, and a number of exceptional utilities. But first, a few notes about the codes you will be seeing in VIC program titles.

Not all VIC owners have memory expansion, and not all programs have the same expansion requirements, so I hope the following system will help. A program labelled **V5K** will only run reliably on an unexpanded VIC, and may or may not run with 3K of expansion. Programs requiring an 8K expander will be labelled **V12K**, and those needing 16K extra will be labelled **V20K**. As before, programs requiring a SuperExpander will be labelled **VSX**. And now, to the September disk.

If **PC II** looks familiar, it should. It is an m/l update of **Puck Man**, a BASIC 'Pac Man' clone. Get out your joystick and stay alert. Another upgrade is **Star Trek**, written for 5K — a classic. Also in the 'fast lane' is a program called **Road Riki**, in which one tries to get Riki across a busy street and safely to the TPUG office. Like 'Frogger', but trickier. **City Crusher** requires that you level a city by bombing it before you can land your space vehicle.

For slower-paced game players, we have **Escape**. You must find your way out of a maze, using an internal view, a la 'Labyrinth'. For the very young, there is **Etch-a-VIC**, which turns your screen and joystick into a doodle pad. The popular 'Scissors/Rock/Paper' game has been turned into **S-R-P**. You play against the VIC. On a more aggressive note is **Missile Cmd**, a faithful (if limited) remake of the arcade hit.

Lest your mind wither from all this game playing, we have included **Moon Phases**, which calculates any year from 100 to 9999. **Stats** will do a lot of statistical analyses on a large variety of data. For you mathematicians, **Funct Anal** will calculate a given function; or a new one may be programmed in. **Base Convert** makes conversions in four different numbering systems.

If you are keen to add some m/l to your programs, or just see how quickly things can happen, have a look at **Screenfil** and **Colourfil**. **Address File** is a very good personal database that features crash-proof input and a handy disk routine. Also for your disk is **Disk Menu**, which will help you load and run programs, or check disk status.

Soon to be the most used program in your disk library is **Unicopy**, a fast and efficient copy utility from Jim Butterfield. And if that's not enough to keep you up late at night, try **VIC FAT-40**, a forty-column PET emulator that works with most BASIC and older PET programs. Imagine. . . 40 columns on a VIC!

PET Disk (P)TJ

Presented by Mike Donegan

Crossword.p is a crossword puzzle generator. It allows you to try various formats for a given set of words, and to print the results. **X-word file.d** is a file of sample data for this program.

Coefficient.p is a mathematical utility for finding the correlation coefficient of two variables. Instructions are included in the program.

Gradebook.8 is for teachers to use in keeping track of their students' progress. The instructions are contained in **gradebook inst.8**. There are several subprograms contained in other files — **add file.8**, **copy file.8** and **names.8**. The package is an upgrade of **gradebk-grades.z** on TPUG disk (P)TS from March 1983.

Marquee.8 allows you to create a horizontal moving sign or marquee. Instructions are included in the program.

The following games are from the Commodore Educational Group or the Ontario Educational Software Project. All these games require 16K to run, and all disable the stop key.

Castle quest.z is an adventure game. Your task is to find the treasure in the castle and avoid the perils while you explore!

Chase.z is a two-player game in which you pursue your opponent around the screen, avoid obstacles, and score points.

Dragon island.z is a variation of the game 'Hunt the Wumpus'. You hunt the dragon in the island's cave with your trusty spear, but beware — the dragon can be dangerous.

Maze.z will generate mazes of varying sizes. You then try to find your way through the maze, running against the clock.

Nuc pow plant.z is a game simulation in which you try your hand at running a nuclear power plant, without the nasty side effects if you fail. The trick is to balance the high temperatures needed for power generation against the temperature limits of the power plant equipment.

Road hazzards.z is based on the game 'Mille Bornes'. You play against the computer to see who can travel 1000 miles first.

Cbm 4032 v2 is a utility which will convert your 8032 to a 40 column machine for the purpose of playing the games programs.

```
16    "list-me (p)tj.l"   prg
82    "crossword.p"       prg
2     "x-word file.d"     seq
67    "coefficient.p"     prg
13    "gradebook inst.8"  prg
29    "gradebook.8"       prg
8     "add file.8"        prg
4     "copy file.8"       prg
16    "names.8"           prg
22    "marquee.8"         prg
57    "castle quest.z"    prg
34    "chase.z"           prg
38    "dragon island.z"   prg
28    "maze.z"            prg
87    "nuc pow plant.z"   prg
56    "road hazzards.z"   prg
4     "cbm 4032 v2"       prg
101 blocks free.
```

PET Disk (P)TK

Presented by Mike Donegan

Ontario driver.p gives you a chance to try to pass the written exam for your driver's licence. Non-Ontario regulations may differ slightly!

Diskview 3.z is a utility that lets you look at your disk, byte by byte. You can look at any block in hex or decimal, change a block, unscratch, or trace the blocks of a file.

Pres gizmo.p contains part of Keith Faulkner's presentation on the User Port at the TPUG Conference this year. The program can also be used to present other information, by using multiple screens.

Pres rs232.p contains part of Keith Faulkner's presentation on the RS 232 interface at the TPUG Conference this year. The program can also be used to present other information, by using multiple screens.

Marathon track.8 is a program to help you keep track of runners in a marathon race. It will sort runners in up to twenty-six groups by class and time. The instructions for the program may be sent to either the screen or the printer, using **marathon isnst.z**. Subprograms for this package include **doc.marathon**, **sorted** and **unsort**.

Mouse maze.z is a game in which you guide a mouse through a maze.

Planet landing.z gives you a chance to land the Canadian Jupiter lander.

Pet man.z is a 'Pac Man'-like game, written in BASIC.

```
19    "list-me (p)tK.l"   prg
107   "ontario driver.p"  prg
83    "diskview 3.z"      prg
97    "pres gizmo.p"      prg
97    "pres rs232.p"      prg
9     "doc. marathon"     seq
2     "sorted"            seq
2     "unsort"            seq
20    "marathon track.8"  prg
2     "marathon inst.z"   prg
54    "mouse maze.z"      prg
43    "planet landing.z"  prg
46    "pet man.z"         prg
83 blocks free.
```

Submissions to the PET/CBM library are currently almost nonexistent, and it's getting harder to get a disk together. If any of you have any interesting programs, we need them for the library. Functional programs are very much in demand. For example, business applications are in short supply, and the farm programs that were on the February 1985 disk are also quite popular.

If anybody has a program or package that was originally intended for sale, but is now not saleable due to poor markets, TPUG will distribute the program through our library, with a message like the following:

This program is freeware. If you want updates or further documentation such as manuals, you will have to contact the author and pay a fee for the extra support. The author gets the program distributed at no charge, and only has to deal with people who are interested in it; thus advertising, distribution costs and royalties are not involved.

We are especially interested in business packages that are no longer distributed in the retail area, but of which the author still has unsold copies in stock, and wants to sell them at a reasonable cost (in line with the relatively low cost of used PET/CBM equipment).

SuperPET Disks (S)TP and (S)TQ,R,S

Presented by Bill Dutfield

These April and May disks will be of primary interest to scientific and mathematically-inclined SuperPET users. April's contributions are of a more general mathematical nature, while May's disk is very specialized.

The April disk contains mainly new material, along with updates to a number of programs previously distributed. Let's start with the new material first. These include mathematical subroutines written in Fortran that compute solutions to commonly-encountered numerical problems. There is also a plotting package. Subroutines for the solution of the following types of problems are provided.

- Solution of systems of linear equations, using Gaussian elimination.
- A Spline interpolation routine, to determine the intermediate values between given points.
- A numerical quadrature program for calculating the integral of a function.
- A second integration routine, based on the Runge-Kutta algorithm. It will solve a system of first order differential equations to a specified accuracy.
- A subroutine to find a zero of a function.
- A function to find the minimum of a function.
- A program to perform the singular value decomposition of a matrix. It can be used with singular or rectangular matrices, and will determine the rank, the determinant and the generalized inverse of the matrix.
- A routine to find the eigenvalues of a general real matrix.

The above fortran programs were made available by Doug Staley. The other new program on the April disk is a plotting package provided by Avy Moise that will drive a Hewlett-Packard plotter. The Fortran package provides the subroutines necessary to control the position of the plotting pen, and to automatically generate selected geometric figures.

The updated material on this disk consists of:

- **Plot-8300Pv3**, for a Diablo 630 or equivalent printer. It has corrections to log-log and log-linear scaling.
- Upgrades to the **DOS:MEM** program, from Alain Proulx, to correct a printer bug.
- A complete text file for **eda.overview.txt**, which was missing some appendix material, as distributed on the original EDA disk.

The May contribution is distributed on three 4040 disks or one 8050. It, too, has been provided by Doug Staley. The programs are an integrated set of Fortran subroutines for the design of modern control systems. These subroutines implement the most important design algorithms for developing linear time-invariant control systems. Besides the subroutines, four examples are provided. These compute the eigenvalues of a linear system, simulate a linear system, design and simulate an optimal linear regulator and, lastly, design and simulate a Kalman-Bucy filter.

Each subroutine is well documented, and the collection of subroutines provides a reasonably full set of matrix handling programs. Functions are provided for

computing eigenvalues, reading in or outputting a matrix or vector, solving linear equations, finding the roots of a polynomial equation, printer plotting, multiplying two matrices, forming dot products, and so on.

Both April and May disks have supporting documentation files, along with the customary describe files.

SuperPET Disks (S)TU,V,W

Presented by Bill Dutfield

The only program on the June disk (one 8050 or three 4040s) is a freeware offering from Delton B. Richardson. This program, comprised of a set of routines, allows the owner of a Commodore 8023P printer to compose graphic images and output them to his printer. These high resolution graphics (512 by 768 pixels) produce a picture that fits on an 8.5 by 11-inch page. The program, called **SPSG**, has a BASIC 4.0 driver and about 4K of 6502 machine language code. The machine language routines reside in high memory, while banked memory is used to hold two character fonts. Banked memory is also used to store the high resolution image being built. The graphics under construction are shown in a window where a portion of the image (42 by 144 pixels) is displayed.

The program has functions for saving and recalling images to and from disk, clearing the picture, printing the image, adding text to the graphics image, block copy and save functions, along with the ability to draw boxes, circles and lines, fill enclosed areas, and so forth. There are supporting utilities that are used to define custom fonts or special character sets for use by **SPSG**.

The level of documentation provided with this disk is very complete, as one would expect of a freeware disk. There are several documentation files accessed by the 6809 mEditor, which provide an introduction, a description, and a tutorial on using the package. Also on the disk is all the assembler code, which is set up for assembly with the WATCOM's 6502 Development System.

SuperPET Disks (S)TX,Y

Presented by Bill Dutfield

This disk (one 8050 or two 4040s) contains recent contributions from ISPUG, in particular their new mEditor, written by Joe Bostic. This editor is modelled on the Waterloo mEditor we are all familar with. It does all the same things, plus a lot more. If you are familiar with the original, adjusting to this version is very easy. What are the areas of improvement? There are many, but I will only review the more noteworthy here.

There is now a true capability to move or copy lines of text from one part of the file to another — a truly worthwhile addition. There are still no split and join functions. The next significant feature is the extended help screens (two of them), which provide the format of each command. Directories are now displayed in two-column format, sorted either alphabetically or in the order they are stored on disk. Commands can be entered on these display panels while the name of the file remains visible. Next, in input mode there is now word wrap to the next line, rather than returning to the start of the same line and overwriting the text you just entered. Disk files can be set up with command sequences and input as batch files, then executed by the editor.

Dick Barnes has written a very nice program called **CALC** that sums columns of digits; converts binary, decimal or hex into any other notation; converts ASCII code to character, or vice-versa; does integer arithmetic in hex, decimal or binary; and does all floating point arithmetic. This program has been married to the editor to provide a really powerful facility. There are many other features of these two programs — too many to mention here.

Another nice utility from ISPUG is Loch Rose's **COPY/KILL**, a machine language program that loads and runs from the main menu. It provides facilities for reading any sequential file, for marking files for deletion, and for marking files for copying.

The other main program on the September disk is a text formatter for the Commodore 8023P printer, contributed by John Bos. It provides for the formatting of text based on embedded tags. In the font selected, you can underline, use bold or reverse print, set margins and plot text layout. It also provides for embedded files and run-time text insertion. Between this program for the 8023P and **finish** on the January 1985 disk, for Epson printers, there should be a program you can modify to your printer.

The other items on this disk includes patches (number three) for mBasic and for mFortran, SuperPET memory maps sorted by title of routine and by address, a program to convert 6809 files to **PaperClip** format, and a routine for use with the Waterloo mEditor, to provide an 80 character buffer for saving and recalling single lines. □

Commodore 64 Disk(C)TJ

```
9     "menu.c",8:          prg
1     "menuml"             prg
2     "menufile"           seq
47    "docfile"            seq
39    "northrup downs.c"   prg
1     "hr"                 seq
3     "list-me animal.l"   prg
11    "animal.c"           prg
4     "animal init.c"      prg
1     "questions"          seq
1     "answers"            seq
55    "tennis stat v1.c"   prg
11    "tennis inst.c"      prg
3     "list-me quiz.l"     prg
57    "quiz.c"             prg
18    "print quiz.c"       prg
1     "pool loader.c"      prg
72    "pool2"              prg
23    "type it.c"          prg
30    "typy toes.c"        prg
72    "crossword.c"        prg
5     "x-word file.d"      seq
15    "calendar.c"         prg
17    "golf doc.c"         prg
22    "course update"      prg
54    "golf handicap"      prg
39    "world conquest.c"   prg
34    "funk rock.c"        prg
17 blocks free.
```

Commodore 64 Disk (C)TK

```
9     "menu.c"             prg
1     "menuml"             prg
2     "menufile"           seq
36    "docfile"            seq
3     "doc printer.c"      prg
97    "pres.rs232.c"       prg
97    "pres.gizmo.c"       prg
1     "pole boot.c"        prg
8     "instructions"       prg
102   "phonepole"          prg
6     "memdump828 ins.c"   prg
7     "memdump828.c"       prg
5     "memdumpdemo.c"      prg
5     "memcompare ins.c"   prg
8     "memcompare.c"       prg
17    "spscr-bas ins.c"    prg
11    "spscr-bas.c"        prg
18    "mlappend ins.c"     prg
8     "mlappend.c"         prg
1     "dump3-boot.c"       prg
4     "dump3-basic.d"      prg
3     "dump3-m/l.d"        prg
15    "dump3-src.d"        seq
32    "c-64 picture.d"     prg
22    "disk house.c"       prg
113   "basic keywords.c"   prg
12    "mortgage.c"         prg
20 blocks free.
```

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3 Letter/No. Code	Description	4040 or 8050 Format	Price

Total $ _____ .00

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To order VIC 20 or Commodore 64 library tapes, send $6.00 for each tape.

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These tapes are for use with a _____ computer and a datasette.

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3 Letter/No. Code	Description	Price

Total $ _____ .00

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Expiry date _____ Signature _____

Reviews

F-15 Strike Eagle
from MicroProse
Flight combat simulation
for Commodore 64
and disk drive

Review by Garold R. Stone

You are flying only 500 feet above the terrain at just over Mach 1, trying to avoid enemy radar — so far, so good. The target is straight ahead and coming up fast. You pop up to 2500 feet, just long enough to deliver the ordnance. Bombs armed... Bombs away! One enemy SAM site destroyed! This is beginning to look like a milk run, all right. Suddenly, an alert light flashes... an air-to-air missile is homing in on you! Quick — release decoy flares! Where did that come from? There's an enemy fighter, right behind you! Turn hard right, forcing him to fly past you. Now come up behind him. Arm your Sidewinder missile. Release it... got him! But now the radar shows a sky full of MiGs. Your choice is to return to base, or press your luck against the enemy's alerted air defence system. You set course for the next target. (You don't want to live for ever, do you?)

F-15 Strike Eagle is the hottest in a series of increasingly sophisticated flight simulation programs from MicroProse. It appears to be faithful in most details to the US-built, single-seat F-15E Strike Eagle — an all-weather, air superiority, ground attack fighter aircraft. The emphasis is on the F-15E's advanced weapons and electronic cockpit displays, including all major flight systems. The DOS-protected disk is compatible with MSD drives, as well as the Commodore 1541. Apple and Atari versions are also available.

A Good Simulation

As the player, you are confronted with seven combat scenarios demanding skilful management of offensive and defensive weapons systems, navigation, fuel conservation, air-to-air combat manoeuvres, and ground attack procedures. The simulation does not include take-offs, radio navigation, or landings — you return to base by approaching it at low altitude from any angle. Flight manoeuvres are controlled with the joystick. Flight control surfaces are automatically trimmed, so you don't need a million dollars in flight training just to keep from crashing! When approaching a stall, the aircraft will try to right itself, if you don't fight the stick when the warning horn sounds. But there are still plenty of ways to crash — by exceeding maximum velocity, for example; or flying into the ground.

A Good Game

There are four skill levels: Arcade, Rookie, Pilot and Ace. At the Arcade level, the plane will not roll during turns, simplifying flight control for those just starting out. The other levels give full control of the aircraft, with increasingly aggressive enemy fighters and SAMs. Anyone can fly this plane; it will take some skill, however, to complete the assigned missions without getting shot down. Bailing out gives you only a 50-50 chance of being rescued, even over friendly territory, so it pays to stay with the plane to the bitter end. Up to four players can compete for the highest score as they take turns trying to survive all seven missions. The scores are reported at the end of each mission, so they don't interfere with the realism of the simulation.

The Flight Manual

The 36-page instruction booklet mimics a US Air Force Flight Operations Manual. It covers the aircraft's systems, flight performance and weaponry, including ten pages on basic aerodynamics, aircraft control, air combat manoeuvres and tactics, to fully prepare you for the seven combat scenarios.

The Heads-Up-Display

The centerpiece of the F-15E cockpit is the Heads-Up-Display (HUD) on the front windscreen, through which you see the sky and terrain. This is the top half of the computer screen. Critical flight and threat data are continuously displayed on the HUD.

I was surprised to find no 'artificial horizon' indicator to show the aircraft's angle of bank. When you lose visual contact with the horizon, you have no way of knowing how sharply you are turning. I sometimes use the 'line of impact' on the air-to-ground reticle because it happens to show the bank angle, but unfortunately even this is not available, after all bombs have been dropped.

Other Cockpit Displays

Just below the HUD, on the computer screen, is the instrument panel, showing air speed, heading in degrees and engine speed. In the lower left is the Horizontal Situation Display, an electronic map of the battlefield, showing the movement of the aircraft, and the location of targets and geographic features. Using the cursor keys, one can set the navigation cursor at any map location and then simply turn the plane until the NAV steering cue is centred in the HUD to take the right heading.

At the bottom centre of the screen is the Radar-Electronic Warfare Display, showing the read-out of your own radar, as well as your Radar Warning Receiver's detection of enemy radar signals, the Infra-Red Warning Receiver's detection of launched enemy missiles or the heat of enemy aircraft engines. Ground targets are also depicted on this screen for reference. There is no read-out of the relative altitude of target aircraft or approaching missiles. The only clue to this is the air-to-air reticle in the HUD, which shows the location of the closest of these threats relative to the F-15E's line of flight.

At bottom right is the Weapons Status Display, showing the availability of medium range missiles, short range missiles, bombs, decoy flares and drop fuel tanks. Remaining cannon rounds are flashed as a message in the HUD when the guns are fired.

In order to gain access to all weapons and flight systems, you must properly respond to an authentication query when you first run the program. The 'Top Secret' query/response pairs are printed on every other page throughout the manual. Be very careful here. You only get one chance at the proper response; if you goof, you have to load and run the program again, which is rather irksome. This kind of password protection scheme should allow the legitimate owner of the program at least one mistake before forcing a reload.

Up Front Control

On the F-15E the Up Front Control (UFC) is immediately below the HUD, again so the pilot can operate critical controls without losing visual contact with a target. Your keyboard serves as the UFC

and provides such functions as activating guns, missiles and bombs, engine control, switching between front and rear views, and bailing out.

Combat Scenarios

The pilot is free to choose the targets and flight route to accomplish progressively more challenging missions in the following settings:

- Libya, August 1981, Gulf of Sidra
- Egypt, October 1973, Yom Kippur War
- Vietnam, October 1973, night raid on Haiphong
- Syria, March 1984, neutralize SA-9 build-up
- Vietnam, May 1972, night raid into North Vietnam
- Iraq, June 1981, strike Iraqi nuclear plant
- Persian Gulf, June 1984, Iran attacks shipping

Realistic Enough

Since the F-15E has yet to see actual combat, these seven scenarios are, of necessity, somewhat contrived. They are also not 'historically' accurate in the choice of aggressor country aircraft. Every enemy country, even Iran, has more or less the same Soviet SU-22, MiG-21 and MiG-23 fighters, all of which look and perform the same in this simulation. They lack fancy tactics, but make up for that by having a seemingly inexhaustible supply of air-to-air missiles and cannon. They don't seem to have any anti-missile defences. Your missiles almost never miss, though more than one hit may be necessary for a kill. When an enemy aircraft is at close range, a recognizable (if sketchy) image of an airplane appears on the screen, which manoeuvres quite realistically. There are no landmarks in the graphics, just the ground, water, sky, sun and moon. The targets and home base show up as a purple triangle on the HUD, if you are below 5000 feet.

This is a very good flight simulation program with plenty of challenges to maintain interest. For me, there was a certain vicarious thrill when, after repeated attempts, I finally completed the first scenario successfully, and returned to land on a US aircraft carrier operating off the coast of Libya.

***F-15 Strike Eagle**, from MicroProse Software, 10616 Dam Road, Hunt Valley MD. $39.95 (US).* □

Cardkey
from Cardco Inc.
Numeric keypad for the Commodore 64

Review by Mike Martin

Cardkey numeric keypad, from Cardco Inc., 313 Mathewson, Wichita KS 67214. $50.00 (US).

The **Cardkey** is a full-featured keypad compatible with both the C-64 and VIC 20 computers. It can be plugged into the joystick port, but must be programmed. A program is provided that matches the information printed on the keys — the digits from 0 to 9, a period, **ENTER**, and the math symbols for four functions. Instructions are given for listing the program, and you are also told how to change the definitions for your special programming needs.

The **Cardkey** can also be 'hardwired' into the computer by ordering an adapter. It costs about ten dollars, and has a female joystick plug on one end. On the other end is a small board with chips and transistors. There are instructions on how to open the computer, unplug one connector, then plug the board between the connector and pins. The installation is easy and takes about ten minutes. When used this way, no programming is needed, and the keys will work with commercial software. Since it is plugged in, not soldered, it can easily be moved back to the joystick port when desired.

There are a couple of minor problems. First, the software is provided on cassette tape, not on disk. If you don't have a cassette unit, you will need to find a friend who has one, and have him make you a disk copy. The tape isn't protected, so a backup or transfer to disk is easy. However, if you have an SX100 version of the C-64, there are no provisions for cassette operations, and the instructions for installation of the adapter do not mention the difference in installation. Also keep in mind that opening your computer case will void the warranty.

If you have repairs done to the computer by Commodore on an exchange basis, remember to remove the adapter before taking it in. It might not come back with the new unit.

A calculator program is included on the tape. It provides a standard calculator with memory and print function. The program works well, but is in BASIC, and slow. If you enter numbers quickly, you may be five or six digits ahead of your screen display, and have to wait for the display to catch up. Since math functions in BASIC are accurate to only eight digits, you will get some interesting effects past that number.

The package is good, works well, and is useful. However, when I first worked with the keypad/calculator, it suddenly dawned on me that I had just paid fifty dollars to convert a two hundred dollar computer into a ten dollar pocket calculator... □

1660 Modem
from Commodore
for the Commodore 64, VIC 20 and Plus/4

Review by Ajay Jindal

Commodore has released a new modem; the 1660 modem/300, for use with the C-64, VIC 20 and Plus/4. It is available in the Toronto area at 'Computers For Less' in Mississauga. It is a 0-300 bps modem with autodial and autoanswer.

The 1660 is about half the size of the 1650, is the same beige colour as the Commodore 64, and has a built-in speaker. There is only one switch on the 1660 (for originate and answer mode). In addition to plugging the modem to the jack, and the phone to the modem, you also plug the audio output of the computer to the modem. The audio connection allows you to use touch-tone dialling, utilizing the sound chips in your C-64 or Plus/4. However, the VIC 20 can't accurately produce the tones, so the manual recommends using rotary with a VIC. With the exception of originate and answer mode, all other modem functions are software-controlled.

There is no carrier indicator light, but the speaker emits a tone when a carrier is detected and the modem automatically goes on-line. The speaker turns itself off when you are connected to another computer. If you keep the modem plugged in at other times, a humming sound comes out of it. It isn't very loud, but can get on your nerves. A splitter is provided so that your audio output can be hooked up to your modem and monitor simultaneously. However, anything that comes out of your monitor speaker will also come out of the modem speaker. The speaker comes in handy when you autodial, because you can hear everything that goes on until you are actually connected.

If you have a phone connected to the modem, it is always operational. This way, you can pick up the phone while you're on-line and hear the modem frequencies. The modem is treated like an extension phone. When you program it to be 'on the hook' it is de-activated. When you program it to be 'off the hook' it can transfer data. Most problems between 1650 and 1660 software incompatibility arise from this 'on/off hook' thing.

Along with the modem, you get a disk with terminal software, a manual, all the cables necessary to hook it up with (except one that you should have got with your C-64), a password for a free hour on CompuServe and an application for a free hour on Dow Jones News Service.

The terminal software for C-64 and Plus/4 is called **Higgyterm** — a great program, except that it doesn't upload or download. It has a buffer, word wrap, clock, printer/disk support, control and escape characters, as well as other things. The parameters, along with sixteen definable function keys and a ten-entry phone directory, can be saved to or loaded from disk. This program takes advantage of the touch-tone feature and can be set up for auto-answer. **Higgyterm** also has a 1650 mode, so people who have 1650s might do well to get this program. VIC 20 users must have at least an 8K expander and use the mini version of the program on the disk.

The manual is very attractive and well laid out. It explains how to hook up the modem to a C-64, Plus/4, SX-64 and VIC 20, complete with illustrations. Most of the manual is dedicated to explaining how to use **Higgyterm** and how to hook up to CompuServe. The greatest shortcoming of the manual is that it doesn't adequately explain how to use the modem from a programmer's point of view. It doesn't give information on how to open an RS 232 channel, dial (rotary), detect a carrier, send or receive data, et cetera. The only thing it tells you is how to produce the touch-tone frequencies, program the modem to be on or off the hook, and detect if the phone is ringing for auto answer mode (which is okay if you already know about modems).

Higgyterm is a good program, but if you want uploading and downloading, a public domain program called **Supercom II** is available, and this one supports the 1660, and both the old and the new C1 protocols. I have also submitted to the TPUG library a version of Steve Punter's **Terminal C1** that I have modified for the 1660.

All in all, I am not unhappy with the 1660, though I feel like a C-64 owner when the C-64 was just released (not much support). I am sure that since the 1650 is no longer produced by Commodore, commercial software will come that supports the 1660, along with all those third-party modems. □

Screen Dumper 64
from Micro-W
Screen dump program
for the Commodore 64

Review by Greg Payne

Recently I got the chance to compare **Screen Dumper 64** with **Graphex**, both of them screen dump programs from different software companies. For testing I used a Commodore 64, a 1541 disk drive and four different printers: a CBM 1525, an MPS 801, a Hush80, and an Epson MX80 clone with a Card/? + G interface.

Screen Dumper 64 is easy to use, and all documentation is on the disk. It can be used in two ways: from a menu for Koala pictures and Simons' BASIC pictures; or in a triggered way, for dumping the contents of the screen by using the **RESTORE** key.

Two sizes of pictures can be printed: 6" by 10" and 3" by 5". The larger one represents all sixteen colours in multicoloured drawings by corresponding grey-scale patterns. Smaller print-outs are limited to four grey-scale patterns, but a colour menu lets you pick a pattern to represent the colours of your choice.

I find that **Screen Dumper 64** works very well with Koala pictures, and the pictures that come out are very pleasing to the eye. The triggered print-out seems to work on some programs, but not on all commercial software. It depends whether or not the software disables the **RESTORE** key, and where in the computer the software resides.

Screen Dumper 64 is compatible with the CBM-1525, MPS 801 and the Hush80 printers, but I could not get it to work properly with the Epson MX80 and the Card/? + G interface. The documentation recommends using The Tymac Connection or Micro World MW 350 interfaces. I did not have one of these, so I could not try it with them.

The one major thing wrong with **Screen Dumper 64** is that there is no printer setup. Also, it uses only CBM 1525 printer codes. This is fine if you are using a CBM 1525 compatible, or MPS 801, but it is a problem if you are using another type of printer.

Graphex
from Vision Software
Screen dump program
for the Commodore 64

The **Graphex** screen dumper disk contains two programs. One dumps the contents of a graphics screen in either high or low resolution, and the other lets you print the contents of a screenful of upper and lower case characters. Commodore graphics characters will also be printed, if your printer allows it.

The **Graphex** screen dumper is compatible with the following printers: CBM 1526, CBM 1525, MPS 801, MPS 802, Epson FX80, MX80, RX80, Spirit 80, Admate, 4023 and Gemini 10X. It also lets you pick a secondary address for the type of interface you are using. It worked excellently with all the printers I tried.

The **Graphex** screen dumper can be used either from a menu, or by putting the appropriate command in a program. It has two menus: one for loading in a graphics picture and one for printing.

In the first menu, you must specify whether the picture is in memory or is a KoalaPad, Logo, Chartpak, Doodle or other type of picture file on disk. Once the picture is loaded in, the program then goes to the printer menu.

The **Graphex** screen dumper's printer menu is quite extensive, allowing you many options such as 'view picture', 'tab picture horizontally', 'double wide', 'double height', 'rotation of image', 'multicolour mode', 'inversion of image', and 'graphic mode' of printer. The 'graphic mode' lets you print different dot densities, depending upon the type of printer you are using.

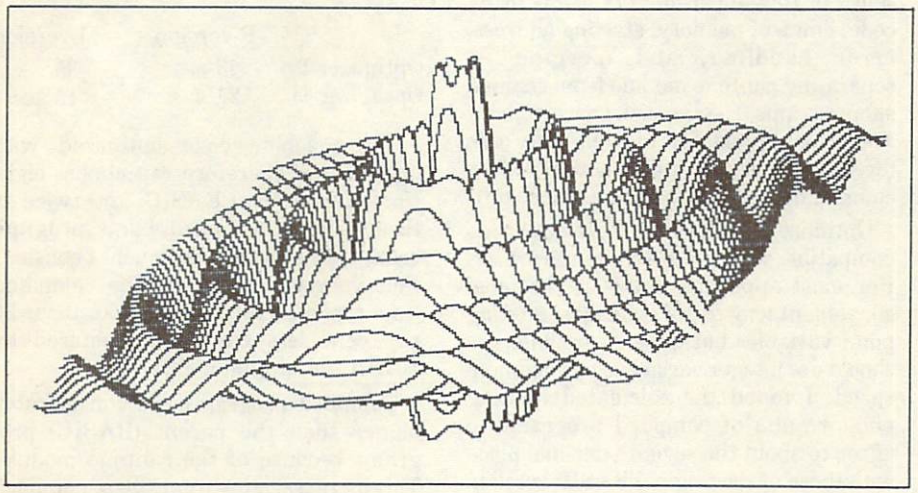
I find the **Graphex** screen dumper to be a very good program that does a nice job on most hi-res pictures. It does seem to have one flaw: some multicoloured pictures from the KoalaPad are not printable using this program.

Screen Dumper 64 and the **Graphex** screen dump each have their strong and weak points. I find it hard to recommend one over the other, and I think you should make your own choice, based on the type of printer you have and your own specific needs. □

Graphic Sr.
from Xetec
Printer interface for the Commodore 64

Review by Mike Martin

Xetec is marketing a couple of interesting printer interfaces that may make you want to dump your old interface, working or not. The first that comes to mind is the Graphics Jr., a standard feature interface for the Commodore, with text and graphics. While it is a good interface, there is not much else to say about it. The Graphics Sr., on the other hand, is a whole new ball game.



This interface includes an 8K buffer, a complete manual, and a disk full of screen dumps, pictures, demonstration programs, fonts and a Font Creator. The interface will access four fonts at a time. First is your basic dot matrix. Next comes a 'near letter quality' font, and two user selected fonts that are downloaded from disk. Xetec provides over twenty different fonts on the disk, and a creator program that allows creation of additional ones. Two sizes of fonts are provided: normal size, and super-fonts that are two lines high. Creation of fonts is easily accomplished with the screen editor. An existing font may be modified, or you can create one from scratch.

Expanded pica
Expanded elite
Exp short elite
Normal pica
Normal elite
Normal short elite

These are the standard fonts provided with the Xetec printer interface. There is also a near-letter-quality mode.

The manual is well written, clear and concise, but the interface is not easily mastered. The Graphics Sr. is capable of so much that the command structure is slightly complicated. The loaders provided (standard, fast-load and VIC) make use of the fonts fairly easy. The interface retains downloaded fonts for about fifteen minutes after the computer is turned off, so even if you use a cartridge-based word processor, you have plenty of time to load the fonts, power down the computer, and plug in a cartridge. The demonstrator program on the Xetec disk provides great screen dumps of the included pictures, and allows demonstration of the fonts on the demo disk.

If you wish to include use of the interface in your own programs, enough technical information is provided to make it possible, but you will still need to digest lots of information on command channels, seventeen secondary addresses and twenty-three commands.

The manual gives directions on hookup and setting the eight active dip switches. Each switch is constantly monitored, and changes are made when the printer finally gets the command. With an 8K buffer, changes may occur as much as a page after you move the switch. Since the buffer speeds up the printing process and removes delays between printing sessions, programs that do banners or very dense screen dumps might overheat your printer. You may need to pay attention to ventilation and build in 'rest periods' on complicated projects.

Xetec

Font Master

Virtually every dot-matrix printer on the market is supported. The manual also states that any daisy wheel printer will work. While the listing and ASCII translations would work, a daisy wheel printer would not be capable of either custom fonts or screen dumps. This interface would therefore be a waste of money, unless you have *both* kinds of printer.

The operational modes include 1525 Emulation, SuperGraphix mode, ASCII conversion and transparent. The last dip switch selects the printer as device 4 or 5.

All in all, the device performs well. It does what it is supposed to. But there are conflicts with some word processing software, so you might want to try it first, if at all possible. Xetec also markets a wordprocessor that includes fonts *without* using the interface. The Graphics Sr. is on its third ROM revision, and the company *is* responsive to its customers: by mail and by telephone. Contact: Xetec, Inc., 3010 Arnold Rd., Salina, KS 67401, (913) 827-0685. □

Bauhaus Font
Block Font
Bold Font
Byte Font
English Font
Typewriter Font
Outline Font
Mirror Font
LED Font
Pudgy Font
Script Font
Shadow Font
Stop Font
Hairpin Font
Stopbold Font
Italic Font
Manhattan Font

These are some of the exotic fonts provided with the Xetec printer interface.

BASIC-64
from Abacus Software
BASIC compiler
for Commodore 64

Review by Ranjan Bose

The **BASIC-64** BASIC compiler is the least expensive compiler I know of for the Commodore 64. It allows two different optimizations, and will produce either speed-code, machine language, or a mixture of both. It also permits overlay chaining that, unlike the usual Commodore chaining, makes the static strings (string contained within program text) available to successor programs in the chain.

Being an interpreted computer language, BASIC is inherently slow. To speed things up one can either use a faster higher level language, or for ultimate speed dive into machine language programming. Before you jump though, think about those piles of BASIC programs you have collected or written! Are you planning to convert those into machine language as well? Well, there is a convenient way of doing exactly that and more — use a compiler! After a BASIC program is in final shape, fully debugged and running exactly as it should, bring in the compiler. This will go through your BASIC program and optimize it, arranging the sequence of code, collecting variables after converting them into the optimum form (integer or floating point), and finally creating the appropriate object code and attaching to it a proprietary subprogram to execute the code during a run (hence the name 'runtime module' or 'runtime library').

There are several compilers available for the Commodore 64, costing 40 dollars (US) and more. **BASIC-64** cost me 47 dollars, including registered air-mail charges. When I started using **BASIC-64** I was pleasantly surprised. This was a powerful program indeed. While most available compilers convert a BASIC program into p-code (pseudo- or speed-code), **BASIC-64** allows three options. You can compile in p-code, which is more compact; or in machine language (m-code), which occupies more space but runs faster. You can also mix both kinds in the same program, thereby using the best features of both. M-code is really effective for speeding up deep-nested loops and sorting routines.

The first step in using the compiler is to load the main program from the copy-protected, write-protected distribution disk. A red copyright screen appears, and the first menu appears on the screen. You now replace the distribution disk with your work disk bearing the BASIC program to be compiled. The menu lets you select one of the two optimizers/ compilers, the overlay (chaining) feature, or the second menu ('advanced development features'). After you have selected the compiling options, the compiler asks you to provide the program name, which is then compiled. A prefix of **p-** or **m-** is added to the filename to indicate the type of code used. The second menu lets you select or toggle parameters like p- or m-code, limits of memory, starting address, error handling, and merging or separating runtime module from chained subprograms (to save disk space). There are also options for viewing the disk directory or sending disk-housekeeping commands (rename, scratch, and so on).

Optimizer-I, the default selection, is compatible with the BASIC interpreter. For most applications this is the most convenient way to go. It handles floating point variables but, where possible, one should use integer variables for maximum speed. I found the calculated floating point results of compiled programs to agree to about the seventh decimal place with those of the original BASIC version.

Optimizer-II is something else! The manual warns the programmer to use it only with programs whose coding logic is fully understood. This is because programs optimized/compiled by optimizer-II are not compatible with the BASIC interpreter. In fact, you can run these programs with the BASIC ROM switched out. This also means that error handling is not automatic and must be attended to. Also, since this mode uses integer variables by default, floating point variables must be specified with compiler directives. If there are too many floating point variables, one should use optimizer-I.

Compiler directives are inserted in the source code as **REM** statements: **10 REM@ directive**. They are used to declare variables as integers or as floating point. One interesting use is to specify a **FOR-NEXT** loop variable as an integer (not permitted normally), which makes it execute faster while using less stack space, which means that loops can be nested deeper than is normally possible. Directives are used also to switch between m-code and p-code within a program, or even to switch optimizers (optimizer-II to handle sections of program that use mostly integers and strings, and optimizer-I for sections that make heavy use of floating point), to free memory space and for error handling.

The compiled code is comparable to and even better than that generated by other compilers. Charles Brannon recently reviewed **BLITZ!** (Skyles) in *Compute!'s Gazette* (January 1985) and, using a program that sorts 100 3-character string arrays reported that the BASIC version ran in 119 seconds, while the **BLITZ!**-compiled version ran in 27 seconds. I used the same program with **BASIC-64** and got the following results:

	P-version	M-version
Optimizer-I	43 sec	35 sec
Optimizer-II	21 sec	15 sec

The machine code optimized with optimizer-II therefore ran almost eight times faster than BASIC, and twice as fast as that compiled by a program costing almost twice as much! I consider that very good indeed. The compiling time reported for **BLITZ!** was about 20 per cent less than that required by **BASIC-64**, a minor difference.

Compiled programs are considerably bigger than the parent (BASIC) programs because of the runtime module. This increase in the total size of compiled programs is true for all compilers, although the core program is smaller than the BASIC version. The m-version is also usually 20 to 50 per cent larger than the corresponding p-version. If the increase in speed is really significant, and if the program is usually rerun several times after loading, then it is worthwhile to use m-code and wait a few seconds longer for the program to load!

A program is compiled in two passes. During the first pass, the code is optimized. During the second pass, the program is compiled, saved to disk and the starting addresses of code, strings, and so on are displayed. When 'READY' finally appears you can go either to a system cold start or back to the first menu to compile another program. If there were 'bugs' in your program, the error message indicates the memory address, and not the line number as in BASIC. An option on the second menu lets you instruct the compiler to generate an address table on disk (Z-filename) during compiling, which holds the line numbers and the memory location of the corresponding code. This can help in

debugging a compiled program. The table can be loaded, and listed to the screen or printer. Another option generates a symbol table (S-filename) of the variables used and their memory locations. This can be read with program called **Symbol** on the distribution disk.

In the overlay mode, you compile each subprogram in sequence. In order to save disk space and loading time, the runtime module can be detached, to be shared by all subprograms. In this case, the loading instructions in the program chain should be non-relocatable (use ,8,1). When you load a machine language subprogram, the program is run from beginning unless you issue a special loading instruction in the compiled program (**LOAD"filename", 8,128**), which causes the first program to continue from where it left off when the load is complete.

Despite its low price and excellent capability, **BASIC-64** suffers from a manual that is in places sketchily or hurriedly written.

Nowhere is it mentioned, for instance, when one should use machine code and when the pseudo code. In places there are brief hints that compiler directives should be used with compiler-II, but this is not true — directives can be used in either mode (see table). Furthermore, the 'N' option that lists the directory is not even mentioned. It appears that the manual was not updated while the program was!

The overlay section is also weak. The option of detaching runtime modules is mentioned, but the exact procedure for doing so is not described. Since the runtime module is about 21 blocks long, and by default gets attached to every subprogram, it should be attached only to the first program. By experimenting I found that you should compile the first program normally, then compile the first pass of the subsequent program as usual. After selecting the second pass of the overlay option, you go to the second screen, toggle option 'G' so that the runtime module is switched off, then return to the first screen and compile. This procedure has to be repeated with each subprogram. Also, the loading instructions for all subprograms should be nonrelocatable.

In general, though, what is lacking in the manual is more than made up by the affordability, flexibility and power of the compiler. In fact, for someone who is using CBM products and is used to the characteristic sketchiness of their manuals, the **BASIC-64** manual would seem good!

Bottom line — despite the minor inconveniences, **BASIC-64** is excellent value for money and is highly recommended. □

G-Wiz
from Cardco
A serial to parallel printer interface

Review by Ian A. Wright

Putting together a modular computer system involves interfacing — attaching the separate pieces together so that they will work properly. Because Commodore does not use common protocol standards (especially noteworthy in the case of Commodore's graphics protocol), attaching a non-Commodore printer to the C-64 requires a translation device called a printer interface. Unfortunately, the printers do not have standard graphics codes either, so this is where the G-Wiz comes in...

The G-Wiz is Cardco's latest printer interface to attach centronics parallel printers (like Epson, Star, NEC, C. Itoh, TEO, et al) to the serial port of the C-64 or VIC 20. It allows your parallel printer to run in 'emulation' mode, so that Commodore graphics programs work without translation. Plug the interface into your printer's parallel port, the serial connector to your drive, and the power line to the computer's cassette port. Follow the manual to set the eight dip switches (exposed on the interface surface) to work with your parallel printer. You can select 6 or 8 bit character sets, transparent mode, character swap, auto line-feed, printer device number, and three other configuration switches. It's easier to do than to write about.

Why the G-Wiz? It's cheaper, faster and easier to work with than the earlier Cardco +G interface, and includes a built-in graphics buffer for high speed screen dumps. I especially like program listings that have cursor controls printed out in words, because they are much more easily read. The interface also provides built-in translation of PETscii to ASCII character codes, and comes with a fifty-page manual, useful for both the new user and the advanced programmer.

I printed a hard copy of this review for *TPUG Magazine* through the G-Wiz attached to my TEO daisy wheel printer, and I had no trouble producing a fine copy, once I remembered that while using word processors like **PaperClip**, you must first lock out the interface with **OPEN 4,4,25**. The G-Wiz automatically translated cursor controls in BASIC program listings into words on both my Epson and my TEO printers. The daisy wheel, however, could not reproduce the curly brackets around each command, since ASCII hex values 7B and 7D are not the same as on a Qume printwheel — typical of the incompatibilities among printers. I also appreciate being able to turn linefeeds off, via the external dip switches on the G-Wiz: (for instance, when I'm using **Printshop**, by Broderbund). It sure beats the contortions necessary to flick the switch inside my Epson.

If that's still too much trouble, I could arrange to have all the dip switches under software control, read the existing switch settings and change them easily.

Owners of earlier models in the Cardco line can upgrade to the G-Wiz for 35 dollars (US) for +G owners, and 40 dollars for B owners, by sending payment and the old interface to Cardco at: 300 S. Topeka, Wichita, Kansas 67202 (316) 267-6525. Judging from the reaction of one +G owner who was shown the G-Wiz, Cardco should prepare for lots of exchanges.

Anyone who works with computers is well aware that printer codes are a jungle of incompatible standards. The Cardco G-Wiz cuts a new path through the jungle to provide a lot of desirable features for the low price of $79.95 (Cdn.). I highly recommend it. □

Creative Writer
from Creative Software
Word processor for the Commodore 64

Review by Michael Quigley

Although it's a bit high-priced at $49.95, **Creative Writer** is an easy-to-use word processor well suited to novices.

It allows full-screen editing with true word wrap, as well as features like 'search' (with or without 'replace'), deletion and copying of any amount of text, and previewing of text before printing. Copy can be flush left, centred or justified, and there are the usual options to control the four margins of the printed page, line spacing, heads, footers and page numbering. Documents can be linked together, and the program can be integrated with two other programs from the same company, **Creative Filer** and **Creative Calc**.

On the negative side, the program is not easily made compatible with other word processors. When formatting disks,

it does not allow input for disk name or ID. The screen colours (black letters on a grey background) can't be changed. Also, you can't make use of any unusual printer features, like expanded or condensed print, as well as underlines, superscripts or subscripts, and double-striking.

In addition to the above faults, **Creative Writer** has two more problems of a somewhat more serious nature. The first is that my printer (a Gemini 10 with Cardco A interface) will not put spaces between paragraphs in the text, nor will it do double, triple, or any other multiple spacing — despite the fact that the preview screen shows the document as it should be printed correctly. After experimenting with a wide variety of inputs and printer dipswitch settings, I wrote to the manufacturer, pointing out that I had never had this problem with several other word processors, including **Speedscript**, **Write Now!**, **Quick Brown Fox** and **Heswriter**.

A second problem relates to the disk's anti-copy protection, in the form of an error on track 2. My copy of the disk also had an error on track 3, which was unfortunate, since four of the program's 'help' files happen to begin on that track!

Some time after I wrote complaining about these two problems, I received a new disk from the manufacturer, with a letter claiming: "The problems you discovered are caused by a disk duplication error. I am sending you a new ... disk with the error corrected." The new disk proved to have exactly the same faults as the old one. As well, the new one would not load in, after running the one-line program found in several users' group magazines designed to keep the head from knocking during the error.

In light of these problems, about the only recommendation I can make for **Creative Writer** is "try it before you buy it". □

Assembly Language For Beginners

by William B. Sanders

from Microcomscribe

Review by Michael Quigley

Are you bewitched, bothered and bewildered by assembly language? Possessing knowledge about this subject is much like belonging to some kind of secret society where you need passwords to enter, and where you dabble in a lot of a arcane mumbo-jumbo, once admitted.

There are numerous books designed to initiate novices into these mystical rites, but most of them have one thing in common: they are written for people who already know assembly language. Fortunately, there are a few books recently available written for the average person. One of these is *Assembly Language for Kids: Commodore 64*, by William B. Sanders.

Its title is deceptive, since the book is not really designed for kids, but rather for people who want to have "a good time learning assembly language". It's written in a chatty, easy-to-understand style, as opposed to the advanced scientific jargon adopted by many other books on 6502 and 6510 programming.

The number of examples in the book is one of its major strengths. These examples range from a short subroutine that clears the screen to the design of a "noisy space sprite". In order to enter the examples, a simple 'Kids' Assembler' is included in the book, which you can either type in or obtain on disk with other utilities from Microcomscribe, at an additional cost of ten dollars. This assembler has a minimal editor, uses non-standard op-codes, and is somewhat slow, since it's written in BASIC. The examples can also be entered with the **Merlin** 64 assembler, which author Sanders describes as "the best available for the 64", or the **Macro Assembler Development System** from Commodore.

For the most part, Sanders proceeds from Point A to Point B, telling the reader that everything will eventually fall into place, even if some matter is not fully understood at the moment. He occasionally drags in an op-code or procedure that is not afterwards explored in sufficient detail, which might be a red herring to some readers.

It should be emphasized that this book doesn't deal with all the assembly language op-codes. It tries to teach the reader "how to learn to use the fundamental operations well and understand their use clearly *rather* than try and learn everything at once and not understand what you're doing." At its conclusion, Sanders gives some suggestions for books and magazines that might help with further study.

The only negative feature of this book is an annoying number of typographical errors; surprising, because Microcomscribe's motto is "literate microcomputer documentation". Some of these occur in the programs, which may cause confusion for novices. Hopefully, these errors will be corrected in subsequent editions of this otherwise excellent book. □

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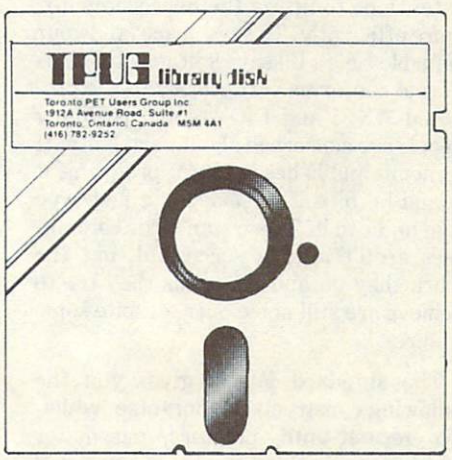

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WATCOM Pascal
from WATCOM
Editor, language disk
and tutorial
for the Commodore 64
$150.00 (Cdn.)

Review by Mike Norman

I am what you might call a 'nut' about structured programming, and I think Pascal is one of the best languages for introducing people to it. It is also a very good language in general.

I am in my third year at the University of Waterloo, studying Computer Science. I get exposed to many interesting (and often bizarre) languages at school, as well as at work. So when I left the classroom and came home to my Commodore 64, I usually just sighed and thought: "Wouldn't it be nice to have Pascal or C. *Anything* is better than BASIC!".

Well, those days are over! Pascal for the C-64 is here! It is a well-designed product for use in educational institutions, but the people at WATCOM will also sell to hobbyists. The documentation is written in a simple, stream-lined fashion that is very good for both classroom use and self-study. There is the added advantage of having the sample programs all on disk.

The editor is the famed Waterloo Micro-Editor, very well known from the SuperPET. This powerful full-screen editor is built right into the cartridge, so this is the environment that one 'powers-up' in. The function keys do things without taking up keys from the keyboard, with **f8** as 'help' key to tell you what all the other function keys do (a very useful feature for me, since I go between different editors at school and at work).

The editor is perfectly suited to creating all your Pascal programs, as well as any data files that you might like to make. There is a command-line down at the bottom of the screen. Most commands are fairly self-explanatory — like **dir**, **load**, **get** and **put**. The **dos** command will send a string to the disk drive command channel.

Device 4 is predefined as the printer, and devices 8 to 11 are reserved for disk drives. To save text that has been created with the editor, the user simply types **put <dev#> "filename"**. If the device number is omitted, it goes to the disk on channel 8. If it is directed to device 4, the file is printed and the filename is ignored. One can see that no special codes or special key-stroke sequences need be memorized.

Once the user has plugged in the cartridge and turned on the power, the editor is ready. To use Pascal, type in: **load pascal** (no **,8** or **SYS** needed). One can get a previously-created Pascal source file, or enter **i**, to get into input mode.

Okay, enough about the editor: now to the juicy stuff! The Pascal implementation is *very* complete, with a lot of special extensions to utilize the microcomputer more efficiently. To save space (and your valuable time), I'll say right now that this Pascal conforms very closely to the proposed ANSI and ISO standards. Many people are concerned about portability. If someone publishes a useful program, it would be nice if *anyone* could just type it in and run it. These standards committees aren't always successful, but the work they do and the goals they try to achieve are still noble ones, despite some failures.

The standard Pascal gives you the following constructs: **if-then-else**, **while-do**, **repeat-until**, pointers, parameter passing, recursion, local variables and procedures.

One can declare the usual data types ('char', 'integer', 'real', 'boolean', pointers, and arrays of any of these). If, however, you would like to build your own types of information, WATCOM Pascal allows this also.

The exciting thing about WATCOM Pascal — unlike some other Pascal implementations I've seen for the C-64 — is that it also allows the programmer to build 'records' of information. This ability to group information together, on a logical basis, is very powerful.

WATCOM Pascal allows the usual 'procedure' and 'function' declarations. One thing that is non-standard here is that you cannot pass procedure-variables as parameters to 'procedures' or 'functions'. As usual, a 'function' can only return 'real' or 'ordinal' types. Parameter passing is either 'call by value' or 'call by reference'.

WATCOM Pascal allows full use of pointers, so that linked-lists can be set up, or arrays of pointers. The only thing that is *not* allowed is a file of pointers, which is not unreasonable: files of pointers are really only useful on large main-frame systems.

Many non-standard string functions have been implemented. These extensions are really useful, and greatly add to the ease of using the Pascal language.

In the **case** statement, WATCOM allows for an **else**-clause, which really helps in catching error conditions!

The pre-defined procedures **reset** and **rewrite** have been modified so that a string is passed back out to the Commodore operating system, and a name is associated with the file you are reading from or writing to. The creators of WATCOM Pascal have also implemented an easy method of using relative files, and there is a graphics library that one can load in, too.

A whole series of procedures and functions allows the programmer access to the microcomputer directly: **address**, **bitread**, **bitset**, **bitreset** and **worksize** are but a few.

That's just about it. There are just two more things that I want to mention: this Pascal runs as an 'interpreter'. As we all know from our own experience with BASIC, this means *slow*! It's not all that bad, but some graphics programs I've tried to run took hours because of all the calculations necessary!

As well, the amount of memory one has to work with is a little small. The work size is about 24K, and this is for both data and program source. A big program, therefore, shouldn't use a lot of data — re-use data, whenever possible. This can be a serious restriction for some applications. (My own pet project is a compiler. These programs are large, involving hundreds of lines of code. Whether or not I get my compiler running is a function of both computer memory and the amount of time I spend on it! It remains to be seen what will come of this.)

All in all, I give the WATCOM Pascal a B+ for results and an A for effort. Of course, someone else may find this Pascal completely inadequate for what they want. The whole package costs $150.00, which is a good price considering that there is equally expensive software available that doesn't give you as much for your money as the Micro-Editor alone!□

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Also included: **ReportGen, ReportMerge** [interface W/P with Database to create form letters, statements, invoices, mailing labels, other reports.]; **Baseball Statistician** [compiles batting statistics for a baseball league]; several W/P utilities, including **Index** [indexes W/P's text files]; several Database utilities, including **DBmerge** [facilitates multi-file database applications.], and **DBStat** [analyzes D/B files]; a programming utility, **ASCII,** which converts text files [program listings] into program files; also **Checkbook**; **Inventory**; **Paper Route**; **Loan Analysis**; **Breakeven Analysis**; **Depreciation**; **Labeler**; **File Copier**; more.

Versions of the package are available for every Commodore computer having a minimum of 10k RAM. All programs will support tape, disk, and printer. Price includes documentation and shipping; Calif. residents add 6%. Add $3 for credit card, COD, 8050 disk, or cassette orders [cassette not available for Plus4™ and 16™.] No personal checks from outside USA. This ad is the catalog; a sampling of program output is available for $2.

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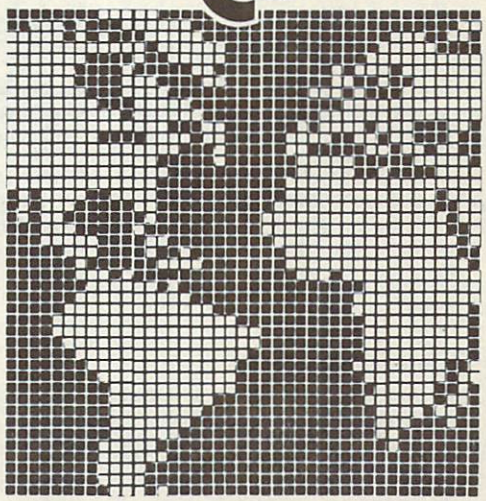

The 1984 Canadian World of Commodore show was the largest and best attended show in Commodore International's history. Larger than any other Commodore show in the World and this year's show will be even larger.

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Bulletin Board

1985 Midwest Commodore Conference

The Greater Omaha Commodore Users Group (GOCUG) will host the 1985 Midwest Commodore Conference/Expo on Saturday, October 12, 1985 at the Holiday Inn Convention Center, 72nd and Grover St., Omaha, Nebraska. Featured speakers include Jim Butterfield, disk expert Richard Immers, and Valerie Kramer, who will conduct an introductory COMAL workshop. Registration fees: GOCUG members, $15.00 (US); non-members, $20.00 ($25.00 after September 27).

Learn Computing At ESA

The Continuing Education Department is offering an expanded selection of C-64 computer courses for adults this fall. Adult day classes or evening courses will be offered at Etobicoke School of the Arts, 675 Royal York Rd., Etobicoke, Ontario. Subjects include Microcomputer Familiarization for Home and Business, Microcomputer Familiarization for Seniors BASIC, Applications, Word Processing, and Using a Database Manager. Register by mail before Sept. 11 (night school), and before Sept. 20 (adult day classes). Cost: $20-25, depending on course. Seniors (64+): free. For further information, call (416) 626-4360, Etobicoke Board of Education.

Unclassified

This space is for the ads of TPUG members. Cost is 25 cents per word. No dealer ads accepted.

For Sale: Used 4040 Dual Drive, 4023 Printer, 2 cables and Buscard I. Now $900.00. Just plug in your C-64. Call 519-745-6789.

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8032 with WordPro 4+ and InfoPro ($575.00), 4040 ($325.00), ADA 1450 and ADA 1800 ($75.00 each). All, including IEEE cable for $1,000. Call John 201-263-4538.

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Products Received

The following products have been received by TPUG Magazine *in recent weeks. Please note that these descriptions are based on the manufacturers' own announcements, and are not the result of evaluation by* TPUG Magazine.

Managing Money

Managing Money With Your Commodore 64 by Amihai Glazer, published by Prentice-Hall Personal Computing Series, Englewood Cliffs, NJ 07632. Price: $20.95 (Cdn.)

Managing Money With Your Commodore 64 has been written for readers who have no extensive financial or computer background, but would nevertheless like to use their computers to perform varied financial calculations. The book contains listings of BASIC programs aimed at helping the user evaluate and compare different kind of loans, investments, mortgages, savings plans, and such.

The author introduces readers to business arithmetic, C-64 operations and the use of the printer. He also briefly describes tasks that are common to most business programs.

Program listings are presented in the following five chapters, each chapter covering a different aspect of personal and family finances (*Calendar Programs*, *Loans*, *Savings*, *Evaluating Investments* and *Charge Accounts*). All program chapters follow a standard format: they include the description of typical uses, practical examples, lists of variables, brief explanations of each important section, variations (including both modifications and extensions), related programs, output from sample runs, and fully documented listings.

PEEKS & POKES

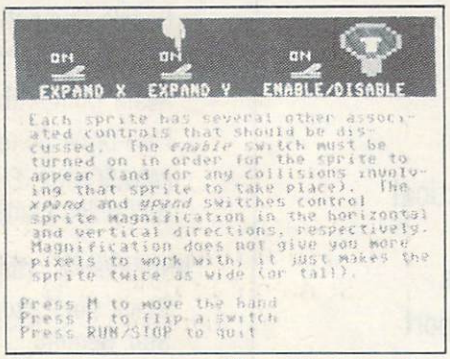
PEEKS & POKES for the Commodore by H.J. Liesert, published by Abacus Software, P.O. 7211 Grand Rapids, MI 49510. Price: $14.95 (US)

This is a book written for users who have some grasp of BASIC but do not know much about PEEKs and POKEs. The author promises to take his readers on "a trip together through the 64's memory and operating system". He has divided the book into three parts. **Part I** answers various questions about zero page, memory map, binary arithmetic, video RAM, high resolution graphics, sprites, sound generation, keyboard, user ports, and such. **Part II** provides short, useful routines in BASIC. **Part III** features an introduction to machine language, including a monitor simulation program.

The last four sections of the book contain program listings, explanations of special symbols, memory map and an index.

The Professor

The Professor from Progressive Peripherals and Software, 2186 South Holly, Suite #2, Denver, CO 80222. Price: $34.95 (US).



***Professor** screen with sprite tutorial*

The Professor, a self-tutorial program for Commodore 64 users, consists of two volumes, one on each side of the program disk.

Volume 1 of *The Professor* has no doubt been written for first-time computer users. It includes two sections:*Introduction to the C-64 Keyboard* and *Introduction to BASIC Programming*. Besides clear and thorough on-screen instructions, the tutorials present numerous illustrations. In *Introduction to the C-64 Keyboard*, for example, *The Professor* displays the keyboard, isolates the individual keys, flashes their location on the keyboard, then defines their function.

Introduction to BASIC Programming is divided into seven subsections, each explaining a different element of BASIC. The following topics are covered: disks and cassettes, BASIC commands, variables, **FOR** loops and **IF-THEN**, **PRINT**, **INPUT** and **GET**, **PEEK** and **POKE**.

Volume 2 provides instructions on the graphics and sound capabilities of the Commodore 64. It consists of eight lessons, six quizzes, a sound generator and a sprite editor. Lessons on sound begin with a brief explanation of the theory of sound waves and music synthesis. From there, the authors of **The Professor** proceed to descriptions of the Commodore 64's sound chip. Sound effects and colour graphics enhance all lessons.

Tutorials on graphics familiarize the user with the C-64's video chip features. As in the section on sound, the user is first introduced to basic concepts related to graphics (for example, the C-64's character set), and then more complex subjects such as sprite theory and sprite creation are demonstrated.

The Professor is a fully interactive program, and the user can proceed through the sections at his or her own pace.

ICCE News

The International Council for Computers in Education offers parents and teachers a chance to obtain a free packet explaining how to help their children towards computer literacy. To receive it, send your name, address and request for the Parent/Teacher Packet to: ICCE, Att: M. Bhone, University of Oregon, 1787 Agate Street, Eugene, OR 97403 USA.

The 1985 edition of the *Educational Software Preview Guide* is now available from ICCE at the price of $8.00 (US). Contact: ICCE, University of Oregon, 1787 Agate Street, Eugene, OR 97403.

MITEY MO Modem

The upgraded version of the **MITEY MO**, being marketed exclusively by Computer Devices International of San Leandro, CA, now includes the **Smart 64 plus 4** terminal software in its new and enhanced package.

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Anyone who has purchased one of the original **MITEY MO** packages, without the new software, can upgrade it by contacting CDI directly at (415) 633-1899. They are selling the **Smart 64 plus 4** terminal software for $19.95 (US), plus $3.00 (US) for shipping.

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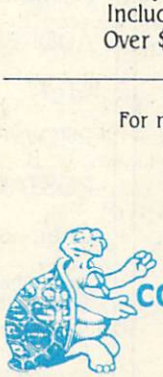

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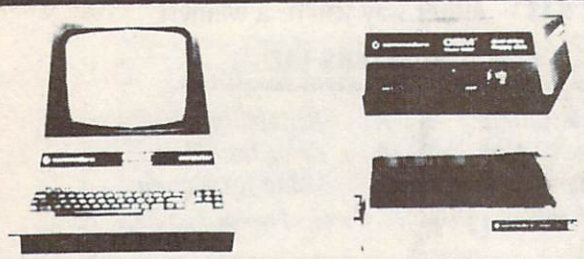

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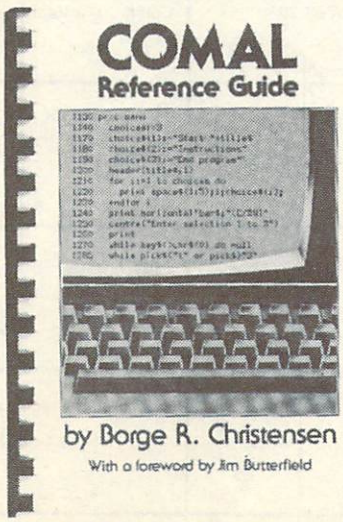

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Meeting Places

Brampton Chapter: Central Peel Secondary School, 32 Kennedy Rd. N. on the second Thursday of the month, at 7:30 pm in the Theatre.

Business Chapter: TPUG Office, 101 Duncan Mill Rd., Suite G-7, Don Mills, on the dates listed below, at 7 pm.

Central Chapter: Leaside High School, Bayview & Eglinton Aves. on the second Wednesday of the month, at 7:30 pm in the auditorium. For 'advanced' computerists.

COMAL Chapter: York Public Library, 1745 Eglinton Ave. W. (just east of Dufferin) on the last Thursday of the month, at 7:30 pm in the Story Hour Room (adjacent to the auditorium). Note: location may change in October — for latest information call 445-9040.

Commodore 64 Chapter: York Mills CI, 490 York Mills Rd. (east of Bayview) on the last Monday of the month, at 7:30 pm in the cafetorium.

Eastside Chapter: Dunbarton High School (go north on Whites Rd. from the traffic lights at Highway 2 and Whites Rd. to next traffic lights; turn left to parking lots) on the second Monday of the month, at 7:30 pm.

Communications Chapter: York Public Library, 1745 Eglinton Ave. W. (just east of Dufferin) on the first Wednesday of the month, at 7:30 pm in the Story Hour Room (adjacent to the auditorium). Note: location may change in October — for latest information call 445-9040.

Hardware Chapter: York Public Library, 1745 Eglinton Ave. W. (just east of Dufferin) on the second Tuesday of the month, at 7:30 pm in the Story Hour Room (adjacent to the auditorium).

New Users Chapter: TPUG Office, 101 Duncan Mill Rd., Suite G-7, Don Mills, on the dates listed below, at 7 pm.

SuperPET Chapter: York University, Petrie Science Building (check in room 340). Use north door of Petrie to access building. On the third Wednesday of the month, at 7:30 pm.

VIC 20 Chapter: York Public Library, 1745 Eglinton Ave. W. (just east of Dufferin) on the first Tuesday of the month, at 7:30 pm in the auditorium.

Westside Chapter: Clarkson Secondary School, Bromsgrove just east of Winston Churchill Blvd. (south of the QEW) on the third Thursday of the month, at 7:30 pm in the Little Theatre. For PET/CBM/VIC 20/Commodore 64.

The TPUG Annual Meeting on October 3rd will be held at Leaside High School, Bayview & Eglinton Aves., at 7:30 pm. All 'regular' members of TPUG are welcome to attend.

TPUG makes every effort to ensure that meetings take place when and where scheduled. However, unforeseen problems may occasionally arise that lead to a particular meeting being changed or cancelled. The TPUG meetings line (445-9040) is the best source of fully up-to-date information on meeting times, and should be consulted.

Are you interested in organizing some other interest group in the Greater Toronto area? Please let the club office know, by mail, phone, or TPUG bulletin board.

SEPTEMBER

MON	TUES	WED	THURS
2	3 VIC 20	4 Communications	5
9 Eastside	10 Hardware	11 Central	12 Brampton
16	17	18 SuperPET	19 Westside
23 New Users	24	25 Business	26 COMAL
30 Commodore 64			

OCTOBER

MON	TUES	WED	THURS
	1 VIC 20	2 Communications	3 Annual Meeting
7	8 Hardware	9 Central	10 Brampton
14 Eastside	15	16 SuperPET	17 Westside Central
21 New Users	22	23	24
28 Commodore 64	29 Business	30	31

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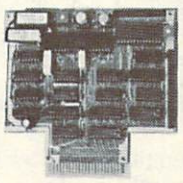

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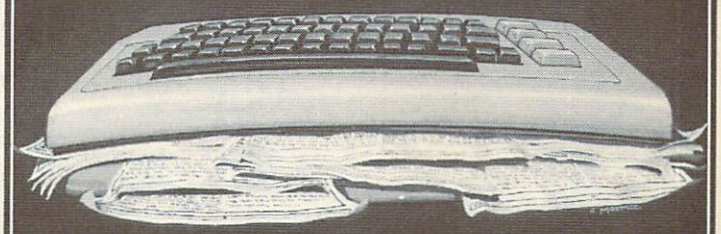

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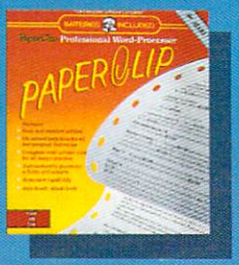

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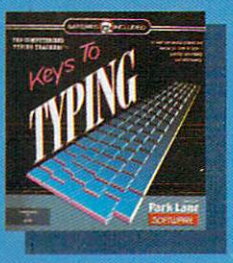

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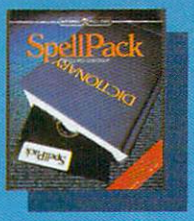

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