

TPUG

February 1984 \$2.95

magazine

The official publication for the world's largest international Commodore users group

The Magazine for C-64,
VIC 20, PET and
SuperPET Users

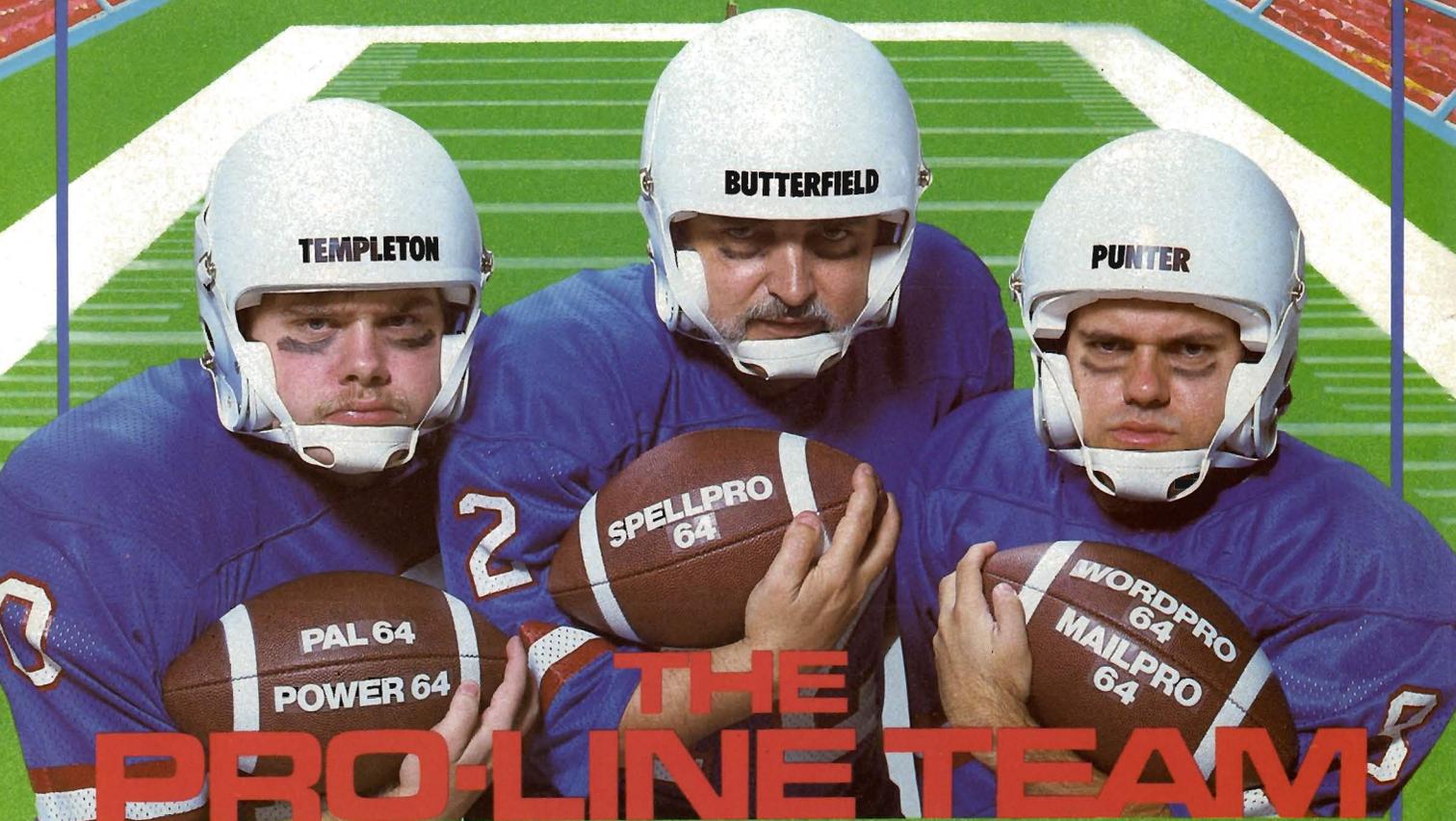
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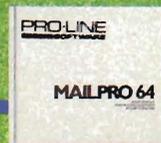
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A New Magazine For TPUG

*Michael Bonnycastle,
President*

Toronto Pet Users Group Inc.

Welcome to this first issue of *TPUG Magazine*, the first of many that you will receive from our club. We are proud of it and we hope you are as enthusiastic about receiving it as we have been in getting it ready. As many of you know, TPUG will no longer be purchasing the *TORPET* from 'The Publisher'. The editorial staff of TPUG produces *TPUG Magazine* from our head office. This is a move that we feel will permit the club to serve its members better. Some readers have asked about this change and, as president of TPUG, I wish to preface our new magazine with a few words of explanation.

I must begin with the formation of TPUG and comment on our goals and objectives as they have evolved. Originally, in 1979 and 1980, the club was a relatively small group of individuals interested in computing with the Commodore PET (2001), and later the 4032 and 8032. We met informally and exchanged ideas and information, traded programs and had a good time discussing new developments and how to make things work — there was virtually no documentation available for Commodore computers! This was our hobby and common problems and questions about Commodore machines bonded us together and set us apart from other computer clubs.

As organizers of these meetings, we met occasionally to iron out problems, arrange meetings and decide how to get information to our members. Thus the Toronto PET Users Group was created. It became a vehicle to organize regular meetings, create a systematic library of the many programs that members were donating, and to reach members with club news and other information.

As membership expanded, preparing and sending out the bulletin became a major task. Mailing and membership were handled by Chris Bennett, who is now our General Manager, and Bruce Beach took on the task of managing the bulletin. In December 1980, the directors formally approved "The *TORPET*" as the name of the official bulletin of the Toronto Pet Users Group. As of a year ago, we were already producing this bulletin for a membership that had grown to roughly 4500 enthusiasts.

The bulletin had become a magazine and it was now an important TPUG service, particularly because, by then, a large number of our members did not live in the Toronto area. To streamline the publication of the magazine, the directors agreed to purchase the *TORPET* under contract from Bruce Beach who set up an independent publishing company, 'The Publisher', to produce the *TORPET*. The price paid to "The Publisher" included production costs and reasonable compensation for the editor to produce the newsletter.

At this stage, there were some significant developments. The *TORPET* expanded in size. Colour covers were added and advertising content was increased. Editorial policy was also established and the content of the *TORPET* was stylized by the editor in the form that is now familiar to members. There was, however, a difficulty that developed in producing the *TORPET* as a club magazine.

While changes in magazine form and content were discussed at director's meetings, and often at length, it became apparent that club directors no longer had significant input into the content

of the *TORPET*. Material was published which, in the strong opinion of some directors, was not appropriate for our magazine, and when club news, calendars of events and even the address and telephone number of the club office was omitted from the publication, the directors jointly decided that it was time for a change. Modifications were discussed repeatedly with the editor but these changes were not forthcoming.

Last summer the club directors and the editor explored the possibility of bringing the publication of the *TORPET* into Toronto under the direction of the club office. However, this arrangement was unacceptable to 'The Publisher'. We then tried to negotiate a purchase agreement with Bruce Beach. But this attempt was also unsuccessful. Finally, the directors agreed to allow the contract with 'The Publisher' to expire with the January issue and provide a publication to our members, created in-house.

As soon as this course of action became apparent, the TPUG office began to prepare for the publication of the new *TPUG Magazine*. We hope that you enjoy this first issue, the official magazine of the Toronto Pet Users Group. As for the *TORPET*—Bruce tells us that he intends to keep on publishing. You will have to purchase any further issues directly from him. Please remember that the *TORPET* in no way represents the opinions, policies or views of the TPUG executive. Nevertheless, we wish Bruce Beach luck in his new endeavour.

As we go into 1984, we are enthusiastic about our new look, and we are looking for new ways to better serve our growing membership. Please do not hesitate to provide us with your feedback on the new magazine. It's yours and we will take every step that we can to see that it serves you.

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*=all, C=C-64, V=VIC 20, P=PET/CBM, S=SuperPET
 G=General, B=Beginner, I=Intermediate, A=Advanced

TPUG *magazine*

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Student — \$20.00

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Editorial

So this is it! TPUG's brand-new magazine! Starting any kind of enterprise is interesting. Starting a magazine, which from its very first issue is guaranteed a five-digit circulation, is very exciting. I hope that some of the creative energy which we feel here in the TPUG Office can also be felt among all the club's members. This is *OUR* magazine. It belongs to the whole club. Let's try to make it the very best publication of its kind.

Along with the excitement, however, there is bound to be a twinge of regret. This first issue of *TPUG Magazine* marks the final separation of TPUG from its former magazine, *The TORPET*, edited by Bruce Beach. TPUG owes a great debt of gratitude to Bruce, who devoted much time and energy to producing its magazine even when the circulation was small and advertising dollars were hard to find. We wish him and his publication well. In the vast and expanding field of computing magazines, there is certainly room for both of us. We will co-exist without rancour.

I often compare TPUG, and its magazine, to an escalator. The people on it constantly move up to higher levels of expertise, yet the escalator as whole remains fixed. In our club, there is a continuous, and very welcome, influx of beginners to microcomputing. We intend that this magazine will always contain articles and helpful columns which are intended for these newcomers. At the same time, we will carry a range of articles which are intended for more experienced users. This magazine will also provide material which is intended for users of all Commodore computers — PET/CBMs, SuperPETs and 'B Machines' as well as Commodore 64's and VIC 20's.

Club magazines often deserve a poor reputation for typographical accuracy. We do not intend *TPUG Magazine* to contain any avoidable errors. To this end, we are using highly automated production methods. We encourage our authors to provide their material in machine-readable form, preferably as word-processor files on disk. If they do so, the entire process of reproducing their articles in print is automatic, without any need for retyping, with its consequent introduction of errors.

In this context, perhaps I should mention to readers in the United States and overseas that, here in Canada, we are very flexible concerning spelling usage. We are accustomed to both U.S. and British styles, and cheerfully accept them both. In this magazine, we intend to maintain this tradition of flexibility. Sometimes this will lead to spellings which may look odd to some of our readers. At least, this way, we hope to be able to please all of the people some of the time!

It would not be appropriate for me, here, to go into details of such things as copyright policies, payment to authors, style guides and a multitude of other vital but tedious matters. Suffice it to say that everything in this magazine is copyright, and that we do pay (quite well!) for articles, but that we ask authors to write them in accordance with our stylistic guidelines. If you are interested in writing something for this magazine, or if you wish to reproduce an article from it, please contact us.

It is conventional for the editorial in the first issue of a magazine to conclude on a note of hopeful optimism. In our case, however, the optimism is surely well founded. In the few short years since microcomputers were introduced, we have seen astonishing advances in their technology and an explosive growth in the numbers of their users. In a sense, the microcomputer is a "dream machine", which allows normal people, in their own homes, to achieve things which would have been the stuff of fantasy only a decade ago. Our club, TPUG, helps each of us to make the best use of our machines. Our magazine *TPUG Magazine* will allow its many thousands of readers to share in the fulfillment of the potential of these fantastic devices. For such a magazine, the future must surely be bright.

David Williams

In accordance with TPUG practice in the past, there will be a combined March/April issue of *TPUG magazine* this year. The next two issues will therefore be published at intervals of about six weeks — the March/April issue in mid-March and the May issue at the beginning of May.

Help!

Do you have anything for this column? The three headings are:

- (1) Helpful Hints,
- (2) Who's Got the Answer? and
- (3) "PET" Pals Wanted.

Just send your contributions (including answers to any questions which have appeared) to:

Toronto PET Users Group
Dept. Help
1912A Avenue Rd., Ste. 1
Toronto, Ontario, Canada
M5M 4A1

Please let us know if you wish your full address to be published.

Perhaps someone can comment on my recent travails with the 1702 color monitor.

I have generally been satisfied with the performance of my Commodore 64 but it seems necessary to transmit my recent frustration in attempting to purchase and use a 1702 monitor. It seems as though the "new" 64s have an 8 DIN video output port as opposed to the "old" model 5 DIN ports. Unbeknownst to me I possessed an "old" type and the cable that came with the 1702 was an 8 PIN/3 RCA plug type. This problem was addressed in the accompanying manual which recommended the use of the 5 DIN/2 RCA plug cable (at the cost of decreased resolution).

Unfortunately such a cable was not included with the monitor. Naturally I went to my dealer to obtain the necessary cable only to find that it was unavailable! Commodore, it seems, has a policy against selling individual parts! Astonished as I was I checked several other dealers only to hear the same story. Reluctantly I returned the 1702 monitor and ordered a 1701 monitor which I hope will be properly equipped.

Can anyone shed light on Commodore's refusal to sell "spare" parts? Why is the 1702 touted as the monitor for the 64 if not all 64's can use it? Why didn't Commodore inform consumers of the change of the output ports?

Robert B. Baker #6712
Northfield, New Jersey

I am a Kindergarten teacher and would be interested in purchasing programmes of educational value for 4, 5, 6, 7 year olds if any members have some.

S. Gallimore #10966
R.R. #2
Minesing, ON L0L 1Y0

First, I would like to know how people feel about the "CBM 64 Rabbit Cartridge" from Eastern House. Since I have heard that the Commodore disk drive is relatively slow, perhaps the "Rabbit" would be a good cheap alternative. I'd like to hear from someone who has tried the Rabbit loader.

Secondly, my job at a hospital has required me to make out a work schedule for a 5-week block for three shifts. I've been trying to develop a scheduling program for the C-64 which is very flexible and allows for personal idiosyncracies. Programming aids that I've tried seem to be geared towards games, home use or business use like inventory management. Do you know how I could get some help with this?

George Baker #1681
Waverly, New York

I have need of a good multiple linear regression programme for my Commodore CBM. Can anyone help?

Len Green' #4607
317 Bristol Road
Timmins, ON P0N 1C0

I own an 8032 and also bought the Anchor (Signalman) modem. The modem is fine but I have had difficulties with the other parts. My phone line has a problem and I have found a solution for this, although many people have told me this is strange: leave an extension phone off the hook! The software enclosed in the modem package would not work with the modem and my 8032, and I ended up getting the McTerm package from Madison Computers. This system works fine now as long as I remember to take the phone off the hook.

Jim Borst
Ellsworth, Wisconsin

I have a number of excellent graph programs, but I have been unable to print these charts on my 1525 printer. I have tried the program in the printer manual and program printed in the Commodore Magazine, but I have been unable to get anything other than junk to print out. Is there anyone who has a reasonable bar graph program that will print out on the 1525 printer, or a way to get my programs to print out on my printer?

Theodore G. Lange
5774 Winsteria Dr.
Riverside, CA 92504

I have recently bought a second 1541 disk drive for my C-64 and, after reading the user's manual, have tried to change the drive number from 8 to 9. Even if they say it is very easy to do, I can't locate the jumper wire that I am to cut. Can anybody help?

Pierre-Yves Meagher #6864
442, 4th St.
Shawinigan, Quebec

Does anyone know of:— a RAM disk for a Commodore 8032, or— a simple "how-to" explanation for the 8096, or— a simple "how-to" explanation for Z RAM

Time simply does not permit my learning assembly programming/addressing— and this leaves me baffled by the documentation I've seen on 8096 and Z RAM.

E. Grafe #4538
P.O. Box 553
Phoenixville, PA 19460

I would like to find out if anybody has used the Smith-Corona TP1 with a VIC 20, and, if so, with what interface; also, how the software they used functioned with the printer. In addition, I would appreciate a recommendation as to what word processing programme to use.

Michael Curran #6516
87 Meloche Street
Ste. Anne de Bellevue, PQ H9X 3L2

PET-Pals

I would like to talk with or write to anybody working with CP/M on Commodore machines.

A. Krause #1083
1611 Arlington Ave.
Saskatoon, SK S7H 2Y6

I would be very interested in contacting other TPUG members, particularly VIC 20 users in Dallas and the surrounding communities of Garland, Richardson, Mesquite, Plano, Allen, McKinney, Rowlett, Farmers Branch and Addison.

Jim Whitecotton #10850;
Garland Texas

CALENDAR OF TPUG EVENTS

1983-1984 Schedule

CENTRAL CHAPTER — Leaside High School, Bayview & Eglinton Aves. at 7:30 p.m. in the auditorium for PET/CBM/SuperPET

Wed. Feb. 8	Wed. Apr. 11
Wed. Mar. 21	Wed. May 9
Wed. June 13	

VIC 20 CHAPTER — York Public library, 1745 Eglinton Ave. W., (just east of Dufferin) at 7:30 p.m. in the auditorium

Tue. Feb. 7	Tue. Apr. 3
Tue. Mar. 6	Tue. May 1
Tue. June 5	

Commodore 64 CHAPTER — Earl Haig S.S., Kenneth & Princess Aves. (6 blocks north of Sheppard, 2 blocks east of Yonge) at 7:30 p.m. in the auditorium

Mon. Feb. 27	Tue. Apr. 10
Mon. Mar. 7	Thu. May 24
Mon. June 25	

WESTSIDE CHAPTER — Clarkson Secondary School, Bromsgrove just east of Winston Churchill Blvd. (south of the QEW) at 7:30 p.m. in the Little Theatre for PET/CBM/VIC 20/Commodore 64

Tue. Feb. 21	Thu. Apr. 19
Tue. Mar. 22	Thu. May 17
Thu. June 21	

SuperPET CHAPTER — York University, Petrie Science Building, enter campus from Steeles Ave. — parking Lot D. Meet at 7:30 p.m. in front of Room 340.

Wed. Feb. 15	Wed. Apr. 18
Wed. Mar. 21	Wed. May 16
Wed. June 20	

MACHINE LANGUAGE CHAPTER (6502) — Call Jim Carswell at 416/531-9909 for additional information.

VIC 20/Commodore 64 Assembly Language and Communications Group — This group has been discontinued until such time as a co-ordinator is found.

COMMUNICATIONS GROUP — York Public Library, 1745 Eglinton Ave. W., (just east of Dufferin) at 7:30 p.m. in the Story Book Room (adjacent to the auditorium).

Wed. Feb. 1	Wed. Apr. 4
Wed. Mar. 7	Wed. May 2
Wed. June 6	

NEW GROUPS IN THE PLANNING STAGES

- COMAL Group
- Eastside Chapter
- New Owners Group

Are you interested in being involved in any of these groups, either as a participant or an organizer? 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.

Note: The February C-64 meeting is tentative. Please check with the TPUG BBS or the office for information.

TPUG ASSOCIATE CLUB CHAPTER

MEETINGS

PET Educators Group (Windsor) — meets at Windsor Separate School Board Media Centre, 1485 Janette Ave. on the 3rd Wednesday of each month (not July & August) at 7:00 p.m.;
Contact John Moore 519-253-8658

London Commodore Users Club — meets at the University of Western Ontario, in Room 40 of the School of Business Administration on the last Monday of each month at 7:00 p.m.
Contact Dennis Trankner 519-681-5059

Genesee County Area Pet Users Group (Michigan) — meets at Bentley High School on Belsay Rd. on the 3rd Thursday of each month at 7:00 p.m.
Contact Gordon Hale 313-239-1366

Sacramento Commodore Computer Club (California) — meets at SMUD Building Auditorium 6201 S St. on the 4th Monday of each month at 7:00 p.m.
Contact Geoff Worstell 916-961-8699

Michigan's Commodore 64 Users Group — meets at Warren Woods High School in Warren on the 3rd Tuesday of each month at 7:00 p.m.
Contact Chuck Ciesliga 313-773-6302

Edmonton Commodore Users Group — meets at St. Gabriel School on the 1st Friday of each month at 7:00 p.m.
Contact Bob Kadylo 403-465-3523

Guelph Computer Club — meets at Co-operators Insurance Assoc. on the 2nd Tuesday of each month at 7:30 p.m.
Contact Brian Grime 519-822-4992

Commodore Users Club of Sudbury — meets at Lasalle High School in the cafeteria on the last Thursday of each month at 7:00 p.m.
Contact Tim Miner 705-566-9632

Sarnia C-64 Users Group — meets at Lambton College on the first Sunday of each month at 7:30 p.m.
Contact J. C. Hollemans 519-542-4710

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Bulletin Boards	Steve Punter	416/625-1786
*Conference	Gord Campbell	416/492-9518
Machine Language	Jim Carswell	416/531-9909
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*Director	Gary Croft	416/727-8795
*TPUG Board of Directors		

This and That

COMAL for the 64

Yes, it has arrived! The TPUG 64 library now contains its first language disk (C)L1 which is the version of COMAL released into the public domain by Commodore Canada. It is available either 4040 format (\$10), or 8050 format (\$12) from the TPUG office. A tape version will follow as long as it will work on tape.

Collectors

As many of you know, there are a number of people in our office and on our board of directors who collect stamps. But that is not all we collect. Some of you send us such interesting note paper, like the one headed "I never met a carbohydrate I didn't like." Other note paper we like to keep because of the unusual pictures. (Actually some of you have very beautiful pictures on your cheques, but of course they can't go into our collection.) Each of our collectables spends a little time on our bulletin board and then goes in an envelope. Our most unusual item is a \$3 bill from the Bahamas which Mr. Hardy, a TPUG member, brought into the office this past October. We plan to make a collage of these items, and hopefully a picture of it will appear in a future TPUG magazine.

Other Computer Clubs

Thunder Bay Commodore Users Group meets the first Monday of the month at the Faculty of Education building, Lakehead University at 7:30 p.m. in Room 219. For information call Mike Richling 577-6236.

Hamilton Commodore User's Group meets the last Wednesday of each month at 7:00 p.m. at Mohawk College, Fennel Campus in Room C-114. Call Tony 545-1649.

Additions to the TPUG Library

Elsewhere in this issue you will find the List-Me files for one VIC 20, two PET, and five C-64 additions to the library. Also, you will find an article by David Bradley which is the documentation for (C)T5, the January monthly release for the C-64.

New Word Processor for the PET

A new word processor for the PET appears on (P)T3 and (P)T4. The original (P)T3 had a file or two for this word processor missing so the word processor was re-released on the December disk as well as being fixed on the November disk.

Disk/Tape Orders

To ensure faster processing of your order, please be sure to enclose your membership number. As a matter of fact it's not a bad idea to include your membership number on ALL your correspondence with the office. Another way to speed up your order is to refrain from including any auxiliary questions, or making any library submissions at the same time. Thanks.

Renewals

Here's how the system works. Let's take as our example someone who's membership card indicates an expiry date of February 1984. We send a "first notice" of renewal early in December, a "second notice" at the beginning of February, and a "final notice" early in March. This member will become inactive March 1, 1984 if the renewal cheque has not been received by the end of

February. If this membership lapses it means (s)he will miss the March/April TPUG magazine since the mailing list for this issue is produced the first of March.

Conference 1984

The conference committee has been meeting every 2 weeks since September (sometimes it was every week!). The fruits of their labour appear in this magazine. Please read the detailed information about what is going to be happening on May 26 and 27 at the Constellation Hotel. We've tried very hard to provide a good selection of speakers for our members, whether they be PET, SuperPET, VIC 20 or C-64 owners. Before making your choice of sessions, please be sure to read our definitions of "Beginner", "Intermediate" and "Advanced". These same definitions were read to our speakers so that we would be able to label the sessions as accurately as possible. Also, don't forget to leave yourself some time for the Answer Room.

Don't delay — do it today — first come, first served! I hope to see you there, whether you live in Toronto Ontario, Tampa Florida, or Takapuna New Zealand.

New Additions To Library

(Access to library available to TPUG members only)

'List-Me' files for the new releases in the TPUG library now appear in each issue of TPUG Magazine. 'List-Me's are on all the disks/tapes which have been added to the library since March 1983. It is hoped that we will gradually provide 'List-Me' files for previous releases and that eventually we will produce a "publication" containing them for all the listings in the library.

ORDERING INFORMATION

Disks

To order club disks by mail, send \$10 for each 4040 / 2031 / 1540 / 1541 disk, and \$12 for each 8050 / 8250 disk (payable in advance). Do not send us diskettes.

Tapes

To order VIC 20 or Commodore 64 library tapes, send \$6.00 for each tape. Do not send us tapes.

To order PET/CBM or Commodore Educational Software tapes, check first in the library. Each entry indicates the number of tapes required directly below the title of the listing. Send \$6 per tape required. Do not send us tapes.

Send all orders to:
TORONTO PET USERS GROUP
1912A Avenue Rd., Ste. 1
Toronto, Ontario, Canada
M5M 4A1

Include:

1. Membership number
2. Return address
3. Type of computer and disk drive
4. Payment by cheque or money order

NOTE: Each List-Me File includes the following notation:

"Copyright (C)1983 by Toronto PET Users Group Inc."

"OK to copy but is not to be sold or published for profit"

Program Contest

This contest is going to be a little bit different, and hopefully will provide some fun for the members as they try to beat the rules. The contest prize of a Commodore 64 (or suitable substitute, at the discretion of the judging committee) will be awarded for the BEST 10-LINE BASIC PROGRAM.

The rules are as follows:

1. Use line numbers 0 to 9 only.
2. The program is to be written in BASIC and be listable. Compaction, PEEKs and POKEs will be allowed.
3. There must be: No machine language — No use of vectors or interrupts — No SYS or USR usage — No calling in of outside programs, overlays etc. — No storing of data outside the BASIC ten lines of the program.
4. Entries must be received in the TPUG office on or before 4:30 p.m., April 1, 1984.
5. Entries must specify on which machine(s) the program will RUN.

The core judging committee consists of Gary Croft, Chris Bennett, Carol Shevlin and Bill Dutfield.

Fitting the most into your ten-line program

*David Williams
Toronto, Ont.*

Squeezing the maximum possible amount of BASIC code into a ten-line program is a tricky business. When the results of TPUG's new programming contest are in, I expect the winning programs to appear to be about three thousand characters long when LISTed — an average of 300 characters per line! This may seem to be utterly impossible to anyone who is used to simply typing programs into a computer. After all, as we all know, no more than eighty characters can be typed in as a single program line on a Commodore 64 or a PET/CBM. On the VIC 20 the limit is slightly longer — 88 characters — but is still far short of the maximum which can be obtained with some of the tricky techniques which I will describe in this article. Furthermore, as we all know, some program

commands such as GOTO and IF... THEN... can have the effect of preventing the intended execution of any statements which follow them on the same line. In most programs the next statements to be executed can be simply written onto a new line, but if the number of lines has to be minimized this is obviously undesirable.

Many of the contest's entrants will probably make extensive use of the abbreviated forms of BASIC keywords when they type their programs. We all know, for example, that a question-mark can be used in place of the word "PRINT". Many users are not aware of the abbreviations which can be used for almost all the other words in BASIC which are more than two characters long. Usually, these consist of the first letter of the desired word followed by the second letter SHIFTED. Thus, for example, "vE" can be used in place of the word "VERIFY". In cases where two or more words start with the same pair of letters, the ambiguities can be avoided by typing two or more unshifted letters followed by a shifted one. So, for example, "gO" means "GOTO". To abbreviate "GOSUB", "goS" must be entered. Some of the abbreviations produce slightly surprising results. "tA" turns out to be the abbreviation for "TAB(", INCLUDING the left-bracket! If you want to explore these abbreviations, I suggest you try experimenting by typing in some trial program lines and then LISTing them. Just as happens when you type a question-mark in place of "PRINT", you will find that the LISTed lines have the BASIC words spelled out in full.

Using these abbreviations allows far more code to be typed onto a single program line than could be done without them. On an 80-character line, it is easy to type code which will LIST to be 100 or more characters long. However, there is a much more effective method of building very long lines. This is simply to write the program in many lines, then to process it with a utility such as "Compactor" or "Constrictor" which are both on disks in the TPUG program library ((O)X1 and (C)D4 respectively). These utility programs require the "source" program

to be recorded on disk. They read the disk file and write a second one in which the BASIC commands are strung into extremely long lines. The length of these lines is not unlimited. It is constrained by some internal requirements of the computer. However, lines which LIST to be about 300 characters long can easily be achieved. The version of the program which is placed into the computer's memory when this "output" file is LOADED thus consists of fewer lines than the original. By using another utility to renumber the lines in this version, they can be given low consecutive numbers even though some of the original lines, and their numbers, have been omitted.

BASIC words such as GOTO, which usually limit the lengths of lines, can often be avoided or modified. For example, dummy FOR...NEXT loops can often be written to cause program execution to jump back to an earlier point, even though that point (and the start of the jump) may be in the middle of a line. Using a STEP size of ZERO will ensure that the jump will always occur, no matter how many times it has been executed already.

Coding like "IF X=5 GOTO 7" can be lethal to long-line programs. Quite apart from the spaces it contains, which should obviously be omitted, it MUST be the last statement on a line. Anything following it on the same line will not be executed, whatever the value of X. One way to improve it is to write something like "ON -(X=5) GOTO 7". This transfers execution to the start of line 7 if X=5. Otherwise, execution continues to the next statement, which CAN be on the same line as the ON...GOTO... It is possible to avoid the restriction that the destination of the jump must be the start of the line if it is earlier in the program than the GOTO. The destination can be marked with "FOR Z=-1 TO 0", and the GOTO replaced with "Z=(X=5):NEXT". If X=5, execution will be sent back to the beginning of the FOR...NEXT loop, which can be in the middle of a line. Otherwise, execution will continue to the statement after the NEXT, which can be on the same line.

continued overleaf

Arranging to jump FORWARD into the middle of a line is much more difficult than jumping backward. It is sometimes possible by POKEing the pointer in the CHRGET routine. However, unless you are really familiar with the internal workings of your computer, I would suggest that you try to avoid doing this.

Expressions such as (X=5), in the paragraphs above, generate a NUMBER depending on the truth of the expression within the brackets. If the statement is false, the number is zero. If it is true, the number is MINUS ONE. Using these expressions often allows IF...THEN... structures to be avoided altogether.

You have probably realized by now that squeezing the maximum possible amount of coding into ten lines presents problems which can be interesting and challenging. This is, of course, why TPUG has decided to hold its latest programming contest of writing the most "useful" ten-liner.

TPUG CENTRAL MEETING DECEMBER 1983

*Ian Wright
Toronto, Ont.*

This last meeting of the year for 1983 was a combined PET/CBM and C-64 meeting.

Mike Bonnycastle opened it by expressing thanks to John Shepherd for a job well done at the "World of Commodore" show. Then the new *TPUG magazine* cover was displayed by Chris Bennett. Mike introduced our featured guest Daniel Cooper who is a lawyer with expertise in the area of copyright law. Mr. Cooper's presentation was so informative and so useful that I will not try to shorten it for these notes, but will make it the subject of another article.

Doris Bradley made some short announcements just before break. These included:

1. Disk CL-1 is the public domain version of COMAL-64 available now in the C-64 library.

2. There are a number of new interest groups that are in the process of being formed: COMAL, East-side, New Owners, and Communications.

After break, Santa Claus visited the auditorium

One of his main jobs is his Christmas list and he explained how he keeps it all in a Commodore file. He said that he wanted us to see how this was done.

In immediate mode:

```
OPEN1,8,2,"0:LIST,S,W"  
PRINT#1,"BONNYCASTLE"  
PRINT#1,"WIG"  
PRINT#1,"BRADLEY BROTHERS"  
PRINT#1,"BRAIN TRANSPLANT"  
PRINT#1,"CHRIS BENNETT"  
PRINT#1,"DANCERCIZE LESSONS"  
PRINT#1,"MIKE DONEGAN"  
PRINT#1,"HAIR DYE"  
PRINT#1,"STEVE PUNTER"  
PRINT#1,"FOOTBALL HELMET"  
CLOSE1
```

To print this to the screen

```
100 OPEN1,8,2,"0:LIST"  
110 INPUT#1,N$,P$  
130 PRINT N$,P$  
140 IF ST = 0 GOTO 120  
150 CLOSE1
```

Santa explained that sometimes the boys and girls are bad and he must revise his gift list. The usual rules say that he should copy the list to a new name because then the old list will be available as a backup—but this time he would simply replace the file.

```
NEW  
100 OPEN1,8,2,"@0:LIST,S,W"  
110 OPEN5,8,6,"LIST,S,R"  
120 INPUT#5,N$  
130 INPUT#5,P$  
140 S = ST (must keep old status in memory)  
150 IF N$ = "MIKE DONEGAN" THEN  
P$ = "TRS-80"  
160 PRINT#1,N$  
170 PRINT#1,P$  
180 IF S = 0 GOTO120  
190 CLOSE5:CLOSE1
```

When the file was printed to the screen, poor Mike Donegan got worse than a lump of coal — at least coal burns.

Santa (Jim Butterfield) then handed out gag gifts to some of the TPUG executive — and got a computer-shaped pillow for himself. Santa's "elves" gave out candy canes as we left.

The new password for the TPUG BBS is

PEACE

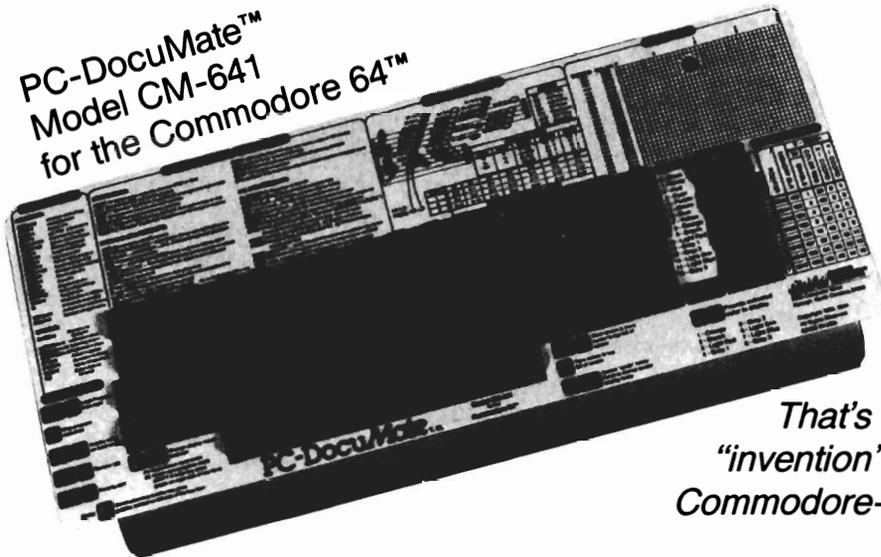
The telephone number is (416) 223-2625.

The operating hours are:

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SUNDAY
— 24 hours.

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We had a problem. So we invented PC-DocuMate™ to solve it. The problem was how to quickly master the VIC-20 and CBM-64 keyboards and easily start programming in BASIC on our new personal computers. First we went through the manuals.

INCONVENIENT MANUALS

The user's guide was a nuisance and the programmer's reference manual was just plain inconvenient to use. We found the control key combinations confusing and the introduction to BASIC to be too "basic" for our needs. We needed a simple solution to our documentation problems.

So we decided to surround the keyboard of each PC with the information we wanted. We decided to print whatever we needed on sturdy **plastic templates** which would fit the keyboard of either the VIC-20 or Commodore 64.

SIMPLE SOLUTION

This was the simple solution to our problem. Now we could have the essential information right at our fingertips.

On the left side and top of the templates we put **BASIC** functions, commands, and statements. On the lower left we used **key symbols** to remind us of how to use SHIFT, RUN/STOP, CTRL and the "Commodore" key. Over on the bottom right side we put some additional keys to help remember about CLR/HOME and RESTORE. But we were still a little confused.

STILL CONFUSED

We found we were confused about music programming, color graphics, and sprites. On both the VIC-20 and the CBM-64 templates we carefully organized and summarized the essential reference data for **music** programming and put it across the top—showing notes and the scale. All those values you must POKE and where to POKE them are listed.

Then to clarify **color graphics** we laid out screen memory maps showing character and color addresses in a screen matrix. (We got this idea from the manuals.)

For the VIC-20 we added a complete memory address map for documenting where everything is in an expanded or unexpanded VIC.

For the Commodore 64 we came up with a really clever summary table for showing almost everything you ever need to know for **sprite** graphics.

GETTING EASIER

Now we had organized the most essential information for our VIC and 64 in the most logical way. BASIC, music, color graphics, and sprites all seemed a lot easier. Our initial problem was solved by PC-DocuMate™.

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Disks, Compatibility, and Inner Secrets

*Jim Butterfield
Toronto, Ontario*

Commodore makes smart disks. The DOS logic is built into the disk unit, as opposed to needing to be loaded into the computer for most other systems. And it's smart logic. The disk knows clever things, such as how to record a different number of sectors on each track, and how to "double buffer" a file so that there won't be a pause as the data flows from one sector to the next.

In fact, I see things built into the disk that are more typical of much larger computer systems. Only the larger and more sophisticated computers are equipped with a "black end" processor dedicated to the job of getting data to and from disk in an orderly manner. The dual disks have two microprocessor chips: not one for each disk as you might imagine, but one to talk to the computer over IEEE-488 or serial bus, and one to talk to the disk mechanism. That's almost overkill . . . yet on the single unit drives, I miss the smooth operation caused by these twin processors.

I'm often asked for details of disk inner workings, and I'm afraid that I can't be of much help. Long ago, I spent time looking at the innards of the 2040, which later evolved into the 4040 dual disk. When the 8050 came along, I looked at the changes associated with 77 tracks (as opposed to the previous 35 tracks). But I haven't kept up with the following 1540/1541 series, the 8250 and the hard disks.

Part of the reason for this is that Commodore changed the inner workings of the disk logic from time to time. I might discover a cute trick that works well on my 1541 and yet fails miserably on someone else's seemingly identical unit. I would feel badly if I published details of inner workings, only to lead others into programming that doesn't work universally . . . or worse, that could cause damage to disk or data. And for that reason, I've never prepared maps and charts of the innards of the newer machines.

I understand that there have been fiascos along this line. "Speed up" programs have been developed that work

on some disks and lock up on others. Protection schemes which rely on certain assumed inner characteristics have proved to fail on some serial numbers of disk.

Those eager to study disk innards should do so cautiously with a view to the pitfall: their disk may not be the same as someone else's.

Given that warning, I might note that the most extensive information on disk inner workings has been published in a British user journal: The ICPUG (Independent Commodore Product Users Group) Newsletter. Mike Todd (no, he's not the one who married Liz Taylor) started a column in the March/April 1982 issue of the newsletter, and he's been contributing ever since. I don't know whether you can get the newsletter without club membership and whether back issues are available, but interested readers might like to contact the membership secretary: Jack Cohen, 30 Brancaster Road, Newbury Park, Ilford Essex, England IG2 7EP.

I'm often asked about disk compatibility. Here's the situation as I understand it at present. There are three types of 35-track disks:

- Type 1: 2040
- Type 2: 4040
- Type 3: 1540, 1541

Any of these disks should be able to read information written by any of the others. But do not—repeat, do not—attempt to write to a disk which was formatted on a different "type" of drive.

In other words, a 4040 can read a disk formatted and written by a 1540 unit, but should never write to it. It might work, but will probably give trouble. On the other hand, a disk formatted by a 1540, may be written upon by 1541 without problems.

The 2031 is an awkward case. I think that it always belongs in type 3, but there may be exceptions. Check 2031 write compatibility by running a few tests of your own, writing on a disk with both types of drive and checking to see if everything behaves nicely.

The 2040 is long gone. I say good riddance: even though it had a few more sectors, later disks were much more convenient. If you still happen to have

an original 2040—one that doesn't "bump" the heads when it's turned on—see if you can get it upgraded; it's just a change of ROM chips.

The 4040 is an area of difficulty. As you can see, it doesn't belong with the newer disks. Yet a dual disk is so much more useful than a single that users will still opt for it, if available. And there's the heart breaker: it seems that the 4040 is no longer available. But there's hope: I hear a rumor that a new low profile dual disk will soon appear in the Commodore line. It will be similar to the 4040, but I for one hope that it will join the type 3 format group and help solve our compatibility problems.

What about the massive capacity 77 track units? The situation isn't completely clear. The 8050 seems to be fading out of the picture in favor of the double-sided 8250. Nice: over a megabyte per platter is a lot of storage. And a single drive unit is on the way—8250 compatible.

The hard disk units—the 9000 series—may just fade away. They did their job well, but there was a major flaw. Performing a backup to another disk—8250, 8050 or whatever—was a slow and tortuous business. There were just too many bytes to be moved. And running without backup could be deadly. Although the 9000's were reliable, they did fail occasionally. And "occasionally" is too often, if the disk holds, say, your accounts receivable or inventory system . . . and you find that backup is too much trouble.

I thought that the 9000 series units were ideal for some types of development work. You could pour in your files, do a sort, summary, assembly, or whatever, and then extract the results and put them onto a floppy disk. No dangerous vital information left on the potentially fragile hard disk.

It seems to me that we all misunderstand the use of disk backup. I've run across several situations where users corrupt a disk in some way, and then immediately take their backup disks and perform exactly the same actions on that disk, corrupting it in the same way.

continued on next page

But the grand prize for useless backups goes to the many users who back up a disk the moment it fails. There's a certain pathos involved here: it seems to me that users want to turn back the

clock and produce the backup disk that they should have made just fifteen minutes earlier.

I sometimes tell users: "I'm too busy to fool around, so I plan my disk fail-

ures. I schedule them for Thursday afternoon. That way, I can do all my backups Thursday morning and won't lose any time". Unfortunately, I think some people believe me.

Computers and Copyright

*Ian Wright
Toronto, Ont.*

At the December Central Meeting of TPUG, Mike Bonnycastle introduced Daniel Cooper. Mr. Cooper, a lawyer with the firm of McCarthy and McCarthy, has experience in the legalities involved in computers. Mr. Cooper stated that considering his varied audience — including software writers, users, and even some "traders" — he would try to cover the general topic of how software is protected in Canada.

Mr. Cooper explained that software authors spend a great deal of time and expense to prepare a piece of software. This work can then easily be stolen. What are the protective processes that the author can call on?

The Patent Statutes are well defined for inventions, but not for software for the following reasons:

1. It takes three years to get a patent and by that time the software is outdated. The patent is retroactive, but the program isn't.
2. To patent software the author must make "disclosure" which opens him to a leak of the source code.
3. The Patent Office is not prepared to patent software by itself. Software resident in hardware (a program IN a machine) can be patented, however.

In the United States the patent office is willing to patent software, but they say that the algorithms are often too simple or are common knowledge. For example, conversion of metric to imperial measure is not "special" enough and they will not give a patent for this kind of program.

The Copyright Act can provide protection for dramatic, literary, musical, or other artistic work. Infringement is defined as copying or "colourable imitation" (derivative works or enhancements). Unfortunately, Canadian law does not define software as literary or whatever. The source code, for instance,

is copyright because it is readable by humans and is considered literary. The object code, however, is not "readable" thus its legal position is unknown. The United States has recently revised their copyright law to account for this discrepancy and Canada is likely to follow that example.

At present a person who has copied a program disk has not infringed on copyright. Further, if software is adapted or changed through time it may no longer be the copyright program. There are no decisions about how much change is enough — nor have there been cases to set any precedents. The Canadian Government has promised for five years to review and revise the copyright laws that, in Canada, date from about 1910. New copyright laws will have to deal with software and other information-matters.

Another area of the law is Contract Law. In business environments when purchasing software, agreements or contracts are made. IBM, and other large-business software vendors, are very concerned about their software and how it is used. Often the company will only contract to lease the software. These software vendors are concerned about how you might use their programs. For instance, you might use it to plan a terrorist attack, and they worry about their liability. In their contract the vendors have small print to cover this kind of eventuality.

When IBM sells a program through a small retail store, they have a tiny contract written on the shrink-wrapping. Although they lose control over their program once it is sold, these big corporations try to cover their liability. They are among the very few vendors who bother. This kind of contract usually says:

1. We are not liable for the use of this program. If the program is no good, a refund can be obtained.

2. You cannot copy or sell this program without the consent of the authors.

At this time we don't know the legal strength of these statements or whether they constitute a licence. You can design-in a contract as part of a software package, but so far there is no such thing in Commodore software.

The last resort is the Criminal Code because — "he's stolen my software". Unfortunately the law is not much help because copying software "... does not deprive the owner of the use or enjoyment" of the program. A recent judgement in the Ontario Court of Appeals, however, called it theft. In this particular case the theft was of information obtained by infiltrating an employee's data bank. The theft of the payroll printout was judged to be unlawful. There may be changes to the Criminal Code to cover unauthorized use of either data or computer systems in the very near future.

Mr. Cooper said that there are three areas where changes are likely:

1. A new Copyright Act — hopefully within the next six months.
2. Changes to the Criminal Code.
3. Changes to contract law to help protect the consumer.

The current system is most unsatisfactory for all the parties involved in computers and their use. The author and vendor get "ripped off", the software buyer cannot legally adapt a program without the author's consent, and the officers of the law have no legal guidelines. This is a new and exciting area of the law and it will have far-reaching effects.

Thank you Daniel Cooper for providing us with a very interesting and informative presentation. TPUG

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42 Added Commands

Like AUTO, which automatically numbers your lines when you are writing a program. DELETE, which removes program lines and sections. And LCOPY and LMOVE (you can probably figure these out!).

The VICTREE lets you take fuller advantage of the Disk Operating System in your 1541 Disk Drive. It gives you key BASIC disk and file commands that you could not otherwise get without greater expense. Here's a small sample:

The DIR command immediately reads the disk directory while leaving the computer's memory completely untouched, and without disturbing whatever program you're working on. HEADER formats an old or a blank disk for use.

CONCAT links (concatenates) disk files. And the VICTREE also has SAVE, LOAD, SCRATCH, and INITIALIZE file command capabilities.

Other Popular Features

EXECUTE, MERGE, and CHAIN are features which will run programs off disk, let you merge two programs off a disk, or add one after the other.

VICTREE has 14 commands that permit the greatest program writing and fixing ease. For writing, the toolkit of commands includes FIND and CHANGE (the programmer's search and replace), which simplifies making changes in your program. The RENUMBER command offers helpful timesaving, by removing the drudgery of line renumbering.

For debugging, TRACE lets you execute the program under your control, letting you see the

next line that will come up. DUMP lists the names of your variables and their value.

The VICTREE allows most BASIC 4.0 programs, especially those for the older PET machines, to work on your COMMODORE 64 or VIC-20, for only \$20 extra. VICTREE comes with a Centronics/parallel standard printers on the market today. And this carefully protected cartridge even has a very simple text editor that allows brief documents to be entered, printed out, or chained together and stored from tape of disk.



The VICTREE Keeps Growing

We recently grafted a "Print Using" BASIC command onto it. Bob calls it "The command that Commodore forgot." It lays out the format of your printout line. The 1983 VICTREE features a new switch, too, that turns the cartridge off and tells the computer that central memory is back in place.

Just plant your VICTREE cartridge in the cartridge port of your COMMODORE 64 or VIC-20 machine. You'll reap a lot of crop! (Cable alone costs \$29.95.) Available immediately from your local dealer. Or order directly to Skyles Electric Works.

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PET/CBM computer with BASIC 4.0 and 32K memory.

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Computers and Colour

R. E. Beasley
Toronto, Ontario

When you consider that about 80% of the information we gather through our senses comes from visual sources, it is no wonder that colour is a strong stimulus. We react to it both physiologically and psychologically. The programmer who knows something about how and why colour affects us will be able to use colour to get better results from the VIC 20 or Commodore 64.

The Physical Nature of Colour

Light is a form of energy that travels by wave motion and is part of the electro-magnetic spectrum. Other types of energy that also travel in wave form are cosmic rays, gamma rays, x-rays, ultra-violet and infra-red, heat waves, and the different radio waves. Waves can vary in length from as short as .00000000000032 cm for cosmic waves to as long as 500,000,000 cm for the longest radio waves.

The usual form of measurement for a wave of energy is in Angstrom Units (represented by the Swedish A), a measurement first proposed by Swedish scientist A. J. Angstrom in 1861. An Angstrom unit is equal to one ten-millionth of a millimetre. Another unit called a nanometre, which equals ten Angstroms, is also sometimes used, but for now I'll use Angstroms.

The visible portion of the electro-magnetic spectrum, or light, varies in length from 4100 to 7100 A. Pass a beam of white light through a prism so that the different wavelengths are separated and the beam will be broken up into colours: red, orange, yellow, green, blue and violet:— the rainbow. Colours are separated when light passes through drops of water suspended in the atmosphere, cut diamonds, the crystal drops of a chandelier or the surface of a soap bubble. Recombine these colours again and white light will be produced.

Red light has the longest visible wavelengths starting at about 7100 A. Orange occurs at about 6200 A, yellow at 5700 A, green at 5200 A and blue at 4500 A. Violet light has the shortest wavelengths

at about 4100 A. Wavelengths longer than 7100 A or shorter than 4100 A do not stimulate the human eye, although insects such as bees can see wavelengths in the ultra-violet and infra-red ranges.

Theoretically, it is possible to see an infinite number of colours, but in actuality, the human eye can distinguish a total of only 128 hues. But by adding white or black to a colour or increasing the brightness or dulling it down, we can create over 7,000,000 variations of the fundamental colours we can appreciate.

Any colour can be simulated by combining, in varying amounts, three basic colours called primaries. In painting, the primaries are red, blue, and yellow, as first suggested in 1801 by English physiologist Thomas Young. However, for other purposes a different triad of primaries was developed by Hermann von Helmholtz in the mid-nineteenth century. These are red, blue and green, the primaries of the human eye and of the cathode ray tube.

Red, blue and green light waves mixed in nearly equal amounts will produce white light; in varying proportions, all the other colours. If one primary is combined with another primary colour, the third will not be produced but rather a secondary colour as follows:

red + blue = magenta
red + green = yellow
blue + green = cyan

A primary colour combined with its complementary secondary will again produce white light, since the secondary is produced by combining the other primaries.

red + cyan = white
blue + yellow = white
green + magenta = white

Colour Perception

When a ray of light enters the human eye, it falls on the retina and stimulates light sensors called rods and cones. Rods see in black and white only and need very little light to be activated, thereby providing us with night vision. Cones, however, need larger amounts

of light to be stimulated, but they allow us to determine colour. There are about 2,000 cones covering the retina and each one is stimulated by either red, blue or green light. Pigments in the cones break down when light of the appropriate wavelength falls on the cone, creating an electrical impulse that is carried by the optic nerve to the visual cortex of the brain. The electrical impulses are then combined to be interpreted as the colour of the object we are looking at.

For example, a yellow object absorbs the blue wavelengths of the light falling on it and reflects the red and green, (yellow being a secondary colour formed by the combination of the two primaries of red and green). The reflected light, when it enters our eyes, stimulates the cones that react to red or green wavelengths to give off electrical impulses while cones that react to blue remain inert. The visual cortex then interprets the different electrical signals sent to it from the cones as yellow.

The eye does not see all colours with equal ability. In most people, the eyes are actually sensitive to yellow-greens, less to blues and reds. Computer screens use either green or amber characters because our eyes focus quite easily on these colours with a minimum of strain.

Colour in C. R. T.'s

The screen of a colour television set or colour monitor is covered with dots of three different types of phosphor that emit either red, blue or green light of various intensities when struck by a beam of electrons fired from an electron gun in the television tube. Since the dots of phosphor are arranged in such a tight configuration on the screen, the different wavelengths of light emitted by the dots appear to overlap and blend into the colour of the screen image. The brightness or dullness of the colours of the various images on the screen is determined by the strength of the incoming signal to the television set.

continued on next page

When a colour television set is connected to a VIC 20 or a Commodore 64, the proportions of red, blue and green light emitted by the dots of phosphor on the screen have been pre-set to give us a ready-made palette of black, white, red, cyan, purple (magenta), green, blue, yellow — the primaries and their secondaries — and various other colours. Because the choice of available colours is limited, smooth variations of colour cannot be achieved. As a consequence, the colours must be uniformly bright or dark, creating a flat, cartoon-like image. A good source of illustrations for use on a computer is a colour-by-numbers book!

However, effective images on your screen can be produced by following some simple rules. Because yellow, or a colour with yellow in it such as orange, appears (mainly for psychological reasons) to be closer to a viewer than a colour with blue in it, use yellow, orange

and green for foreground objects, red and cyan for middle-ground objects and blue and magenta for background whenever possible. Also, use yellow, green and orange to highlight an important piece of information, especially on a bar-graph.

If two small images are placed side by side coloured similarly i.e. cyan and blue, or yellow and orange, they will be very hard to differentiate. However, if the coloured areas are increased in size, their colours will be seen without any loss of contrast if they are complementary, such as light blue and light yellow, pink and cyan, and light green and light purple.

Background colours can subtly alter an image. It will appear larger on a dark coloured background than a light coloured background. Blue and yellow images appear larger than red although they are the same size, possi-

bly because of the way the cones are distributed in the retina. The red cones are concentrated in the centre of the retina, contracting the perceived image, whereas the blue and yellow cones are found towards the edges of the retina, thereby stretching out the image.

The illustrations in a child's colouring book can be easily adapted to use on a VIC 20 or Commodore 64 as well as needle-work patterns that use a grid such as those for bargello, cross-stitch and petit-point.

Colour is an amazingly complex subject. Many of the processes that determine how we perceive the world around us are not yet understood. And yet, we often take colour for granted since it is such a fundamental part of our lives. Enjoy discovering more about colour on your VIC 20 and Commodore 64.
TPUG

Robbers of the Lost Tomb - A Review

*George Shirinian
Toronto, Ont.*

*Robbers of the Lost Tomb. Timeworks.
\$29.95 tape or disk. For Commodore 64.*

This is a graphics adventure game in which you, as the pith-helmeted professor, explore the mysterious pyramid in search of the 4 lost tablets of gold. Your search will take you through 100 rooms across 5 floors, and will be hindered by sinister snakes, menacing mummies, frightening phantoms and perilous pits.

This melodramatic description of the game does not quite do it justice. It is well conceived and a joy to play. It is a one-player game, with 10 skill levels. The graphics and colour are good and the movement particularly smooth, as

the program is compiled. (Partly because of this the program takes some 15 minutes to load in the tape version!). A game can last from 2 to 5 hours, and there is a save feature for you to continue where you left off for another day. In addition to the graphics, I must mention the delightful music that accompanies the professor's movements. This, along with the monsters and other hazards, prevents the constant wandering through similar rooms from becoming monotonous.

The game can be played with either keyboard or joystick as your man wanders through the pyramid. "Robbers" is suggested for ages 15 to adult, possibly because some concentration is required, but I think those even younger might enjoy it. TPUG

A.E. Krause
Saskatoon, SK

SUPEREXPANDER for the VIC 20

GRAPHIC 0 Returns to text mode. Do not relocate program and clear variables.

GRAPHIC 4 Returns to text mode. Relocates program to power-up condition and clears variables.

GRAPHIC 1, 2, or 3

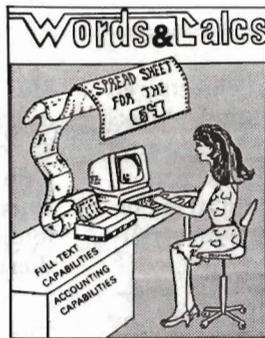
Relocate program to proper location if extra memory is available ab above \$2000 (8k and or 16k memory expansion present) all variables cleared at this time.

Use GRAPHIC n(1<= n <-3) followed by GRAPHIC 0 to relocate program then return to normal text mode as a first line in a program if you have an 8K and or 16k memory expansion plus the SUPEREXPANDER.



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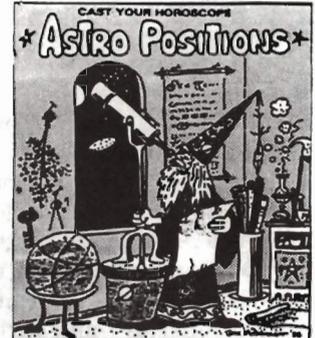
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TPUG AT THE WORLD OF COMMODORE SHOW

Ian Wright
Toronto, Ont.

A Lamborghini? The exhibit nearest the entrance to the Home Entertainment Show at the International Centre featured this luxury sports car and I wondered if I had made a wrong turn or been teleported somehow to another show. Needless to say I bypassed the rest of that section and moved quickly to the "World of Commodore".

My first impression was that, although the booths were well spaced, there were a lot of people around each exhibit area. Many of these visitors to the show were carrying bags and boxes with the names of retail stores, indicating recent purchases. One of the most noticeable advertising gimmicks was the presence of metal buttons that said TPUG in big letters.

A lot of exhibitors sported them, and these TPUG buttons were also worn by quite a few of the show visitors. I was gripped by an immediate desire for one of these "badges" and headed for the TPUG booth. After some aimless wandering I finally asked for directions to TPUG, and then found that I couldn't get within arm's reach of the booth. There were people two and three deep in front of the counter. At this point I found out that new TPUG members were given a TPUG button when they paid for their membership. According to club manager Chris Bennett, the club sold over 80 memberships on the first night. By the end of the show TPUG had 260 new members!

A number of people changed from associate to regular members at the booth and I took the opportunity to ask them why. In almost all cases I was told that they wanted to come to one or more of the monthly meetings that TPUG provides because they had heard that these meetings were very useful. Each person's "use" was slightly different, but most wanted to meet people with similar interests and to draw on the knowledge of the club's resident "experts".

The sales technique that the club used during the show was very simple — buttonhole anyone passing by! Many

'TPUG - THE WORLD'S LARGEST COMMODORE USERS' GROUP'



And still growing could have been added to our sign at the World of Commodore show in December — over 300 new members joined TPUG at the show.

of the show visitors had heard of the club, but were unclear what TPUG might do for them. Club members handed out thousands of information bulletins, each packed with material about the club. The information included disk catalogs and list-mes, names and responsibilities of the club's executive, the dates and times of various club meetings, and lots of other pertinent information about TPUG.

At this point some visitors had questions related to Commodore hardware or software use and it was these questions that caused crowds to gather around the TPUG booth. John Shepherd had arranged for a variety of club "experts" to be at the booth over the four days of the show. There was always someone near the counter with a knowledgeable response whatever the question. These impromptu lectures and discussions drew other show visitors, many of whom subsequently became new members.

The TPUG booth was arranged by John Shepherd with help from a large number of other club personnel. TPUG's was obviously a "working" booth rather than just a display since there were many items for sale — including some show specials. Posters advertised the sale of three disks of programs selected from the PET, VIC 20, and C-64 libraries that had been prepared and duplicated prior to the show. The cost of each disk was \$5.00 for members and \$15.00 for non-members — another incentive for joining the club. Sales were brisk. One member from the United States had phoned in requesting library

disks worth hundreds of dollars, and came to the show to pick them up. Back issues of The TORPET were also for sale. At the end of the first day alone total sales were over \$2500.00!



TPUG members who dropped into the show finally met David Bradley, C-64 librarian — shown here signing up a new member.

There were a number of other exhibits at the TPUG booth. The TPUG magazine displayed its gorgeous first cover and our new magazine's advertising manager had put together a very successful information package for prospective advertisers. Doris Bradley loaned the club her personal C-64 to visually and effectively present information about TPUG to people passing by.

The TPUG booth was successful because a number of services were provided for the show visitors by informed and interested people. During the show the club made new friends and re-established many older friendships. John Shepherd and his committee are to be congratulated and thanked for a job well done. TPUG

REACTION FROM EXHIBITORS AND SPECTATORS

Stan Koma
Toronto, Ont.

If the reaction from exhibitors and spectators is any indication, the World of Commodore show held at the International Centre in Toronto Dec. 8-11 was a huge success.

Rick J. Duval, sales manager for Batteries Included in Toronto, said he was impressed by the volume of sales for the the company's PaperClip word processor, and Delphi's Oracle, a data base management system. When dealers ran out of these programs at the show, he said, Batteries Included had to supply them with more. "We did not expect such a response," he said. "It was far beyond our expectations."

Peter Smith who heads Richvale Telecommunications in Richmond Hill, Ont., was generally pleased with the very large crowds that came to the show. "We never expected such crowds," he said. "If we had been better prepared, we could have done three times the business." However, even though sales were brisk, he felt such a show should not include a Sunday.

Exhibitors not only came from Canada but also other parts of the world. Tony Wilkes, technical director for Oxford (England) Computer Systems (Software) Ltd., had a booth promoting Interpod, which allows the VIC 20 and C-64 to communicate with PET peripherals, and PETspeed, a BASIC compiler. He described the show as "great." His staff was able to secure a Canadian distributor and sell all the software they brought.



Electronic 2001's Randy Robot made the rounds of the show sporting a TPUG booster button and telling people where and how they could join the group.

Among the great variety of products displayed by exhibitors was one which employed the use of the SuperPET and the 8032 for industrial control and process automation. James Holtom of Control Microsystems of Montreal said the booth was primarily used for promotion. It takes between six months and a year before a firm decides to buy one of these products. "There is no question we considered our presence a success," he said.



A young fan gazes in awe (or terror) at Virgule 3, Commodore's sophisticated robot.



Jim Butterfield gave tips on proper usage to computer novices.

One software exhibitor was so busy serving customers, he had no time to comment on the show. "Customers come first," he said with a smile.

Spectators interviewed at the show said they were impressed by the variety and new products they saw.

Pete Deacon of Dunnville, Ont., who has a Commodore 64 at home and works on a 8032 at work, said he wished he had a blank cheque at the show. He was especially impressed by the volume of software for the C-64. "I found a chess game for my C-64," he said happily.

Dan Hill of Richmond Hill said he was most impressed by the display of the history of Commodore. However, he liked the software too. "I saved \$100 here," he said.

Doreen Mouatt of Toronto who owns a Commodore 64 said she was happy to see the large stock of books for the 64. With her friends, she was looking for a game that would rival "Jumpman" and a stock market program. "A show like this keeps you up to date," she said.

J. Tiongson of Scarborough, Ont., came with his friend and children and "we're having a great time." He felt the show was very informative.

One 14-year-old who came out of the Arcade section of the show had a grin on his face. "Didn't cost me a cent," he said.

Most of the spectators interviewed said they would like to see a show like this presented annually. TPUG



TPUG Guru—Jim Butterfield explains the inner workings of the PET "mind".

One dealer pointed out that when many people crowd a booth, it was very easy for someone to get "sticky fingers" and some smaller products simply disappear.

Canadian BBS's

*Jim McLaughlin
Toronto Ontario*

ALBERTA

BBS name	Location	Phone number	Hours
EBBS-80	Calgary	403-253-4676	Non-bus.
Bob Akaye's RCPM	Edmonton	403-463-4774	Non-bus.
Commodore BBS	" "	403-466-7656	Non-bus.
Computron RBBS	" "	403-482-6854	Non-bus.
Edmonton RCPM	" "	403-454-6093	24 Hours
KCBBS	" "	403-482-1935	9am-12am
Northern Alberta	" "	403-474-0147	Unknown
South Side RCPM	" "	403-463-5774	Unknown
Stadium RCPM	" "	403-479-3450	24 Hours
Gaming System	Lethbridge	403-320-6923	Unknown

BRITISH COLUMBIA

BBS name	Location	Phone number	Hours
Kelowna ABBS	Kelowna	604-767-7047	Unknown
Mission BBS	Mission	604-462-8633	Unknown
RCPM #1	Prince George	604-562-9515	Non-bus.
RCPM #2	Prince George	604-562-9515	Non-bus.
ABBS	Vancouver	604-437-7001	Unknown
ABC CASH BBS	" "	604-876-4719	Non-bus.
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ATARI BBS #2	" "	604-688-5405	Non-bus.
Basicly Computers	" "	604-271-3354	24 Hours
CBBS	" "	604-687-2640	24 Hours
Frog Hollow BBS	" "	604-937-0906	Unknown
Heath	" "	604-430-8233	24 Hours
H&S Micro	" "	604-430-4145	Non-bus.
IGC	" "	604-986-4444	Unknown
MicroStat	" "	604-224-2337	24 Hours
On-Line-80	" "	604-594-7398	Non-bus.
Pacific Blue	" "	604-584-1049	24 Hours
Pals-80	" "	604-591-6975	24 Hours
POCO BBS	" "	604-464-7693	Unknown
Satyricon CBBS	" "	604-438-2468	24 Hours
TVG Systems	" "	604-738-1640	Unknown
Island Micro	Victoria	604-384-4711	Non-bus.
RCP/M	Whalley	604-584-2543	Unknown

MANITOBA

BBS name	Location	Phone number	Hours
J&J Electronics	Winnipeg	204-943-6916	Non-bus.

continued overleaf

ONTARIO

BBS name	Location	Phone number	Hours
Halton/Peel Club	Georgetown	416-877-0933	Unknown
HBOBB	Hamilton	416-385-4598	24 Hours
Motor City BBS	Oshawa	416-728-6574	Unknown
CBBS	Ottawa	613-236-3009	Unknown
Compumart ABBS	" "	613-725-2243	Unknown
ETW	" "	613-748-1035	Unknown
\$Atari Infosystem	Toronto	416-622-2462	24 Hours
BULL '80	" "	416-265-3227	7:30pm-8am
Colour 80	" "	416-767-0412	Non-bus.
Computer Camp	" "	416-683-2226	Non-bus.
CoCo Nut	" "	416-743-6221	24 Hours
*CFTR BBS	" "	416-366-2069	Non-bus.
CSE Atari	" "	416-236-1512	9pm-10am
ETI BULL I	" "	416-423-3265	Non-bus.
ETI BULL II	" "	416-423-3263	Non-bus.
Exceltronics	" "	416-921-4013	24 Hours
Games BBS	" "	416-439-0065	7pm-9:30pm
Heath Users Group	" "	416-232-2644	Non-bus.
\$LOGIC Inc.	" "	416-447-8458	24 Hours
\$Net-Works #1	" "	416-445-6696	24 Hours
\$Net Works #2	" "	416-683-3733	24 Hours
Night Owl	" "	416-222-3626	Non-bus.
*\$BBBBS	" "	416-487-5833	24 Hours
PCanada	" "	416-499-7023	24 Hours
*Pet Users (TPUG)	" "	416-223-2625	Non-bus.
*PSI-Wordpro	" "	416-624-5431	Non-bus.
\$RCP/M # 1	" "	416-231-9538	24 Hours
\$RCP/M # 2	" "	416-231-1262	24 Hours
*RTC	" "	416-884-6198	Non-bus.
TMUG	" "	416-451-7137	Unknown
Toronto Medical Net	" "	416-978-6893	Non-bus.
ASC Microsystems	Thunder Bay	807-345-7199	Non-bus.

QUEBEC

BBS name	Location	Phone number	Hours
B.E.L.E.	Montreal	514-622-1274	24 Hours
Computerland	" "	514-931-0458	24 Hours
Contact	" "	514-336-4921	Unknown
Distra-Soft	" "	514-327-5764	Unknown
Micro-Mart	" "	514-731-9487	Non-bus.
Trading Post	" "	514-737-4630	Unknown
Telesiaq	Quebec	418-659-3863	Non-bus.

* = PET Systems

\$ = Pay Systems

Bulletin boards are nomadic and the author accepts no responsibility for changed information. All first-calls should be by hand. Please send any updates to Jim McLaughlin C/O TPUG magazine. TPUG

BBS Ethics

*David Williams
Toronto, Ont.*

This past summer, many of us saw the movie "War Games", which depicts a computer-enthused teenager who accidentally makes telephonic contact with NORAD's main computer and comes very close to starting a nuclear war. Most of us probably dismissed the movie as being a piece of harmless fantasy which has very little relationship to reality. Anyone with some knowledge of computers could recognize that some scenes contained factual errors. These gave us some grounds to hope that the main premise of the film — that a military disaster could result from the accidental intrusion of a "hacker" into a computer system — is also unrealistic.

The people who run the Toronto Transit Commission, it is rumoured, try to limit publicity of such events as suicides on subway lines in order to prevent to many people from getting bad ideas into their heads. The TTC executives would not be surprised to hear that the public release of "War Games" has been followed by a vast increase in the incidence of attempts by children of all ages to use home computers and modems to break into computer systems in which they have no legitimate business. People who would not dream of trying to pick locks, and physically to break into the premises of businesses, government agencies and other individuals, have somehow been persuaded that breaking into computer systems is different. In fact, a commercial enterprise has marketed a computer program for \$19.95 which automatically seeks out and attempts to break the security of these systems, and is successfully making money from it. In short, a bad example has been set.

The motives of those computer burglars are irrelevant. Many of them, I am sure, have no harmful intent. Like the man who, a year or two ago, broke into Buckingham Palace and sat on Queen Elizabeth's bed, they are motivated more by curiosity than malice. But their capability of causing accidental harm is much greater. An intruder into a computer system can, all too

easily, blunder into giving a signal which the computer interprets as an instruction to alter or erase information stored within it. There have been cases in which this has actually happened.

Whether harm results or not, the act of breaking into a computer system without authorization is ethically indefensible. It is an intrusion into the private property of some organization or individual. Governments in both Canada and the United States are moving to make sure that people who commit this type of intrusion can be successfully prosecuted. Normally, I tend to look askance at governmental attempts to impose legislation which further restricts the freedom of action of any individual. However, in this case I feel that the proposed tighter legislation is amply justified. Its purpose will be to ensure that people are guaranteed privacy within their own computer systems — an aim which I fully support.

Those of us (and there are many) who use computer communications for purposes which are legally and ethically acceptable have not enjoyed the publicity surrounding the "hacking" fad. In the public eye, we have all been tarred with the same brush. Our integrity has needlessly been called into question.

There is another major area in which the activities of modem-equipped petty criminals is troublesome. This is software piracy. It has become common for computer bulletin board systems (BBS's) to be used to distribute illicit copies of copyright programs. One user breaks any security device on the program and uploads it to the BBS. Any number of other users subsequently download the program, and thus get it for free. Unfortunately these activities are sometimes tolerated, or even actually encouraged, by the System Operators of some BBS's.

Apart from the fact that this type of piracy is illegal, it is detrimental to the authors and distributors of commercial software. It prevents them from obtaining the income to which they are entitled as a reward for their work.

Indirectly, it therefore discourages people from writing good commercial programs, reduces the amount of software available, and ultimately harms the pirates, to whom an abundance of software is vital since they are rarely capable of writing any programs themselves. However they are also rarely capable of the kind of far-sighted thought which might lead them to realize that their activities are self-defeating.

Many readers in the Toronto area will know that I am actively involved in running several BBS's here, including TPUG's own system. In this role, I often have to delete copyright programs which have been uploaded to the BBS and to take other measures to prevent the system from being abused as a vehicle for piracy. The reactions of some users to these actions are pathetically amusing. Essentially, they get enraged by the fact that I am spoiling their fun. They cannot appreciate the fact that their actions are illegal. The notion that piracy reduces the amount of software available to them is quite beyond their intellects. They are also unmoved by the argument that (in the case of the TPUG BBS) the club must maintain good relations with software companies and must not be seen to be tolerating or encouraging piracy. The few of them who are prepared to try to defend their own actions seem to consider software piracy to be some kind of victimless crime, using arguments similar to those which are put forward for the decriminalization of activities such as the smoking of marijuana. They do not appreciate that piracy does certainly have victims, including themselves.

I feel it to be a sad comment on the state of the computing community that these activities have become prevalent. "Hacking" and piracy are, in my view, activities which betray the fact that many computer users are very young and have immature, childish views. But maybe, as these people grow up, they will learn to act more responsibly. I like to hope so! TPUG

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Overview

- 0 — Using CodePro-64
- 1 — CBM-64 Keyboard Review

BASIC Tutorial

- 2 — Introduction to BASIC
- 3 — BASIC Commands
- 4 — BASIC Statements
- 5 — BASIC Functions

Graphics & Music

- 6 — Keyboard GRAPHICS
- 7 — Introduction to SPRITES
- 8 — SPRITE Generator
- 9 — SPRITE Demonstrator
- A — Introduction to MUSIC
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Our *Music Generator* and *Music Demonstrator* will provide hours of instruction and creative enjoyment. From the beginning of your instruction you can *compose simple tunes* on the screen using the generator. Once you've completed a composition you can *save the tune* and its associated SID parameters to a diskette file. Our music sam-

ple program can be used alone or incorporated into your own programs to *read the saved music file* and replay your songs.

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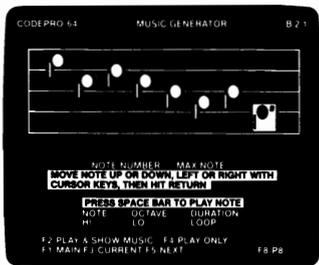
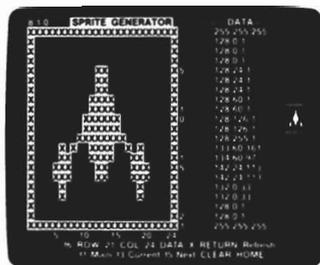
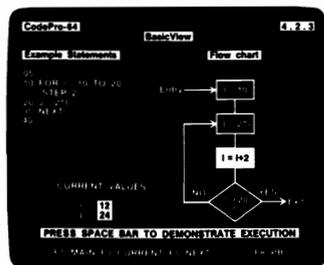
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Ride the IEEE Express

*Steven Darnold,
Alexandra, Otago, New Zealand*

(Editors Note: The DAMS interface is unfamiliar to us. It appears not yet to be available in North America).

In the beginning all Commodore computers used the IEEE-488 bus to attach printers, disk drives and other peripherals. This IEEE standard is widely used on scientific instruments and on several other microcomputers, notably Hewlett Packard. While not as widely used as the RS-232 and Centronics standards, IEEE-488 is superior to both. It sends data a byte at a time — so it is much faster than RS-232, which sends data a bit at a time. Moreover, it has a two-way capability which the Centronics standard lacks.

Commodore produces six different IEEE disk drives. These range from a single drive, with the same specifications as the 1541, to a multi-megabyte hard disk drive. Commodore also produces four IEEE printers. In addition, many printer manufacturers supply IEEE versions as an option.

With such a solid base of IEEE peripherals, it is surprising that Commodore switched to a new serial standard on the VIC 20 and C-64. However, the reason is simple: the serial port is cheaper to implement than an IEEE bus. This reduces the cost of VIC 20 and C-64 peripherals by about \$100.

Cheaper peripherals are nice, but there is a price to pay: the serial standard is much slower than the IEEE. An IEEE disk drive, for example, is more than twice as fast as the 1541.

To gauge the loading speeds of the disk drives, I chose a 26K program as my standard. I used the same disk in all of the drives, and I reset my C-64 before each trial. First, as a point of reference, I loaded the program on cassette. It took 488 seconds. Then, I loaded it on the 1541: it took 67 seconds. This makes the 1541 about seven times faster than cassette. Next, I put an IEEE interface on my C-64 and loaded the program on a 2031 drive. This drive is the exact equivalent of

the 1541 drive, the only difference being that it uses IEEE-488. The 2031 drive loaded the program in 26 seconds. This is more than twice as fast as the 1541. Then, for my last trial, I loaded the program on a 4040 dual disk drive. This IEEE drive loaded the program in 16 seconds.

Most Commodore 64 owners will be quite happy with the loading speed of the 1541. It may not be lightning fast, but it's reasonably priced and it does the job. Some users, however, will want something faster. Business users, in particular, should consider the speed advantages of the IEEE drives. In addition, the dual IEEE drives offer considerably more storage capacity and enable backups to be made quickly and easily.

For light business use, the 1541 is all the Commodore 64 needs. It will happily perform some wordprocessing, prepare a payroll, or print out an updated price list. Backups are awkward to do on a single 1541, but if they don't have to be made too often, there should be no problem. However, if a business wants to use the Commodore 64 heavily, particularly if it needs to maintain a lot of records, the 4040 dual drive is better. It is four times faster than a 1541, it has twice the storage capacity, and it has a built-in backup command. Moreover, the 4040 can read (but cannot reliably write to 1541 disks).

The 4040 costs much more than a 1541, but for some applications it will be worth it. The bigger IEEE drives are even more expensive, and they cannot read 1541 disks. Nevertheless, some users may want to consider them.

Before you rush out to buy an IEEE disk drive for your Commodore 64, beware of the fishhook. Many disk programs for the C-64 are especially protected from copying. Unfortunately, this protection may block the program from loading on an IEEE drive. "Easy Script", for example, will not load on some IEEE interfaces. Talk this over with your dealer. Don't buy an IEEE drive unless he will let you return any programs which don't work.

If you decide to use IEEE peripherals on your C-64, you will need an IEEE interface. There are at least four to choose from: the LINK from Canada, the DAMS and the INTERPOD from Britain, and the CIE from the United States. Todd Hamilton described the LINK in the July TORPET. It is an attractive product and is popular in North America. However, although the LINK is available in New Zealand, I decided to buy the DAMS IEEE interface.

The main difference between the LINK and the DAMS is that the DAMS is much cheaper. Of course, the LINK is more than just an IEEE interface: it also provides BASIC 4.0 disk commands, a machine language monitor, a parallel port and a modem routine. However, if you don't want these extras, there is no need to buy the more expensive LINK.

Although the DAMS does much less than the LINK, it is much, much bigger. It protrudes 15 centimetres out the back of the C-64, and it has no support feet. This is its worst feature. Not only did I have to be careful not to damage the board, I had to push my monitor back to an uncomfortable viewing distance. In the end I solved both problems by getting a plastic platform for my monitor and cutting a hole in the front side. I then pushed the C-64 up to the platform so that the DAMS slid through the hole under the monitor.

The reason for the size of the DAMS IEEE is that space has been left on one end of the board to attach a socket for other cartridges, and on the other end of the board for a networking connector. I would have preferred a smaller board, but some people may find these options useful.

The DAMS has many attractive features. Unlike the LINK, it uses no BASIC RAM in its normal position. Thus, it is less likely to need relocating. Furthermore, if you do want to relocate it, it is not necessary to load and run a special program: a single SYS shifts the code.

continued on next page

The DAMS is automatically enabled when the C-64 is turned on, and it integrates itself well into the system. Unlike the LINK, the DAMS automatically polls both the serial and IEEE buses. Thus, a serial printer and an IEEE disk drive can easily be used together.

The DAMS manual claims that it will load copies of "Easy Script" produced since April this year. However, my copy of "Easy Script" is an old one and would not load. "Zork" and "Deadline", on the other hand, both loaded easily.

The DAMS interface works well with my PET system. The C-64 and the PET happily share the IEEE bus (as long as they don't use it simultaneously). I use the PET's 4.0 commands for most disk operations, especially for catalogs, copying and formatting. The only thing I can't do is read the error channel with the PET's DS\$ when the C-64 gets a disk error.

I like the DAMS IEEE interface. It provides simple, straightforward access to the IEEE bus without disturbing the C-64 too much. If you have a PET system or require the extra capabilities of IEEE peripherals, then it's worth considering the DAMS interface. Stick the cartridge in your C-64, attach a PET-IEEE cable, and you're ready to ride the IEEE express. *TPUG*

BUSCARD

*An accessory utility
review by R.J. Lever,
Thornhill, Ont.*

How many times have you wished you could just plug your printer and disk drives (single or dual, or if you are lucky, both) into one control accessory?

How many times have you wished you had access to a reliable machine language monitor, and had available to you on your C-64 the advantages of Basic 4?

Well there is a product available now for your C-64 that does all of that and more! The well known firm of Batteries Included, in Toronto, make available through a conventional retail dealer network and from their own stores, the Commodore 64 BUSCARD, at a suggested retail price of \$199.00 CDN.

The BUSCARD is a small 140mm X 90mm X 35mm box that plugs directly into the C-64's cartridge slot. Prior to insertion however, the user must open the case of the the C-64 and connect two small clips to easily-identified board positions. These clips are terminated through a fine wire connector which in turn is connected to a small receptacle on the BUSCARD. The instructions and diagrams for this exercise are very well illustrated and easily understood.

On the top of the unit is an open Cartridge Slot which allows the use of cartridges while the BUSCARD is in place. Also on the top is a row of 8 mini switches which allow the user to designate any one or a number of devices that the C-64 could address.

On the right side of the unit is an IEEE output connector which allows the user to connect and operate any IEEE-488 peripheral device, and on the back of the unit you will find a Parallel Printer output connector. YES THAT IS RIGHT — the BUSCARD also provides for the direct use of a parallel printer (Epson, Centronics, Mannesmann etc.).

To enable the BASIC 4 or Machine Language Monitor modes the user simply enters a SYS command. You exit the BASIC 4 with another SYS command and exit the Machine Language Monitor by typing "x". The benefits of BASIC 4 are well known and do make working with a mixed system a much easier and of course, speedier exercise. Although the writer is far from being an expert, the Machine Language Monitor proved to be easy to work in all facets of operation. The writer has also been told by some experts that the Machine Language Monitor is indeed a very effective utility.

One of the very nice features built into the BUSCARD is that it allows you to mix Serial and IEEE devices together at the same time. For instance, you can use say a 4040 dual drive together with a 1541 single drive, and operate both with the absolute minimum of inconvenience. You may leave both drives as device 8, one on Serial and one on the IEEE-488, or alternately you can change one of the device numbers either through a hardware change on the 1541 or through a program change for the 4040.

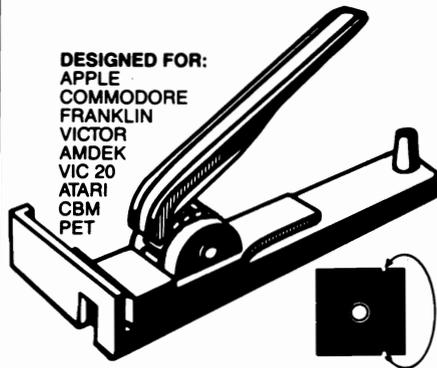
The only criticism worth mentioning is that the mini switches are difficult to work with and perhaps could have been located in a more visible position for the C-64 user.

The BUSCARD certainly deserves all the attention it is getting. It has obviously been well designed and is fast becoming one of the most important accessories for your C-64 system. For those of you that would like to "put it all together", it is well worth the money. A highly recommended product. Pay a visit to your local dealer and see if you don't agree. *TPUG*

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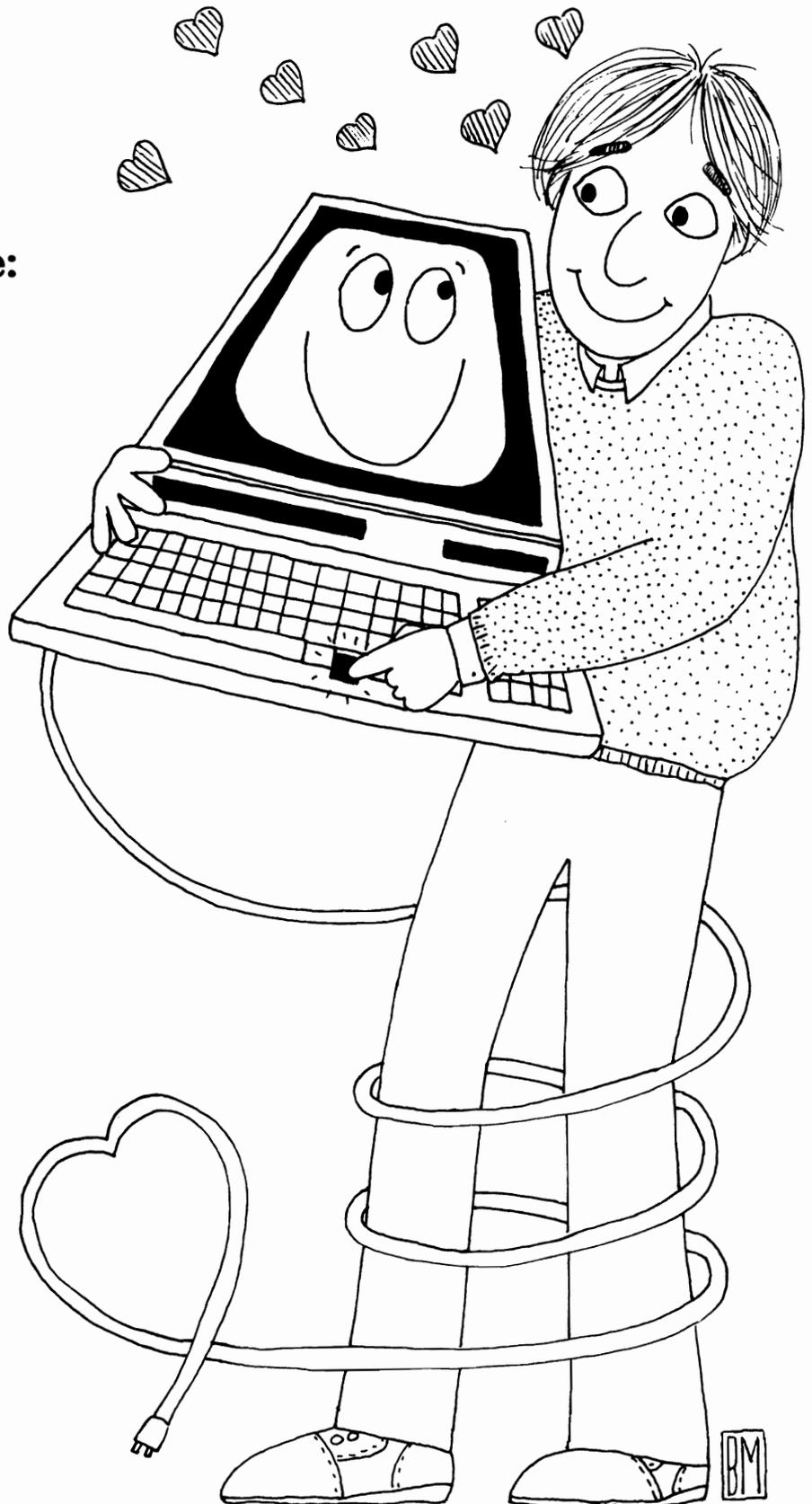
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Late registration, after April 15, or at the door, \$25.00

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MAY 26 & 27 – RESERVE THESE DATES ON YOUR CALENDAR NOW!

TPUG Annual Conference Speaker Information

Definitions:

Beginner:

Has succeeded in setting up his/her machine for operation. Knows how to load and run programs written by other people. Can write a program to display his/her name on the screen. Has an interest in knowing more.

Intermediate:

Can write programs which interact with the keyboard and screen. Has mastered the most commonly used words in the BASIC language. Is comfortable modifying BASIC programs written by other people.

Advanced:

Has a good grasp of the entire BASIC language. Has succeeded in programming most of: sprites, SID, joysticks, data files, POKE, printer. Probably can write some machine-language. Understands most POKES on his/her machine.

Conference Speaker Schedule

Note: speakers and times subject to change without notice

Saturday — May 26, 1984

11:00 to 11:50 a.m.

Topic: Relative Disk Files

Session: A-1 **Speaker: Chris Bennett, TPUG Business Manager**

Description: Chris will describe how to write a program which creates, updates, and reads relative files, with a VIC 20 or Commodore 64.

Level: Intermediate Repeat session: H-2

Topic: Comparison of programming languages

Session: A-2 **Speaker: Brad Templeton, author of PAL and POWER**

Description: What makes a language 'good'? Brad will answer this question while comparing several popular languages.

Level: Advanced Repeat session: H-1

Topic: Software Portability

Session: A-3 **Speaker: Dr. Don Cowan, professor of computer science**

Description: A description of methods and techniques to allow software to be easily transported from one machine to another. Will also address adapting software from one machine to another.

Level: Intermediate

Topic: Formatting a report

Session: A-4 **Speaker: Keith Falkner, software consultant**

Description: How to write a BASIC program which creates a formatted report, with headings, aligned columns of numbers, and totals. Will also address some of the 'human factors' in making a report readable.

Level: Intermediate Repeat session: I-5

Topic: Integrating Business Applications

Session: A-5 **Speaker: Rob Lockwood, Director of Information Systems**

Description: Demonstration of commercially available business software packages working together (spreadsheet, data base, word processing). How to transport data from one application to another. Discussion of specific features to look for to enhance compatibility.

Level: Intermediate Repeat session: H-5

12:00 to 12:50 p.m.

Topic: Evaluating Commercial Software

Session: B-1 **Speaker: Jim Strasma, editor of *The Midnite Paper***

Description: How to recognize good products in the store. What the consumer should look for.

Level: All Repeat session: K-2

Topic: Networking

Session: B-2 **Speaker: Bill McLean, president of BMB Compuscience**

Description: Discussion of networking. What it is, and what it does.

Level: Intermediate/Advanced. Repeat session: I-2

Topic: Getting acquainted with Machine-language

Session: B-3 **Speaker: Steven Bolger, hardware and software developer**

Description: An approach to learning machine-language by breaking the learning process into easily absorbed segments.

Level: Intermediate Repeat session: I-4

Topic: User-port hardware

Session: B-4 **Speaker: David Williams, editor of TPUG Magazine**

Description: How to make your computer interface to the outside world. Includes construction of simple hardware which will be electrically safe and not damage your computer.

Level: Intermediate Repeat session: J-4

Topic: Better BASIC

Session: B-5 **Speaker: Jim Butterfield, TPUG guru**

Description: How to learn techniques to develop better programming style.

Level: Beginner

1:00 to 1:50 p.m.

Topic: Interfacing to a video-disk

Session: C-1 **Speaker: Don Whitewood, educator, consultant**

Description: Demonstration of connection and program to create interaction of computer with video-disk. Shows computer as a control device.

Level: Intermediate/Advanced Repeat session: G-1

Topic: Comparison of C-64 databases

Session: C-2 **Speaker: George Shirinian, librarian**

Description: Demonstration of three popular data-base programs for the Commodore 64 (Flex-file, Oracle, the Manager). Comparison of features and advantages.

Level: All Repeat session: J-2

Topic: BASIC for Beginners

Session: C-3 **Speaker: Cheryl Regena, associate editor of Compute's Gazette**

Description: How to do a variety of things in BASIC without adding any memory or peripherals.

Level: Beginner Repeat session: H-3

Topic: Computer Law

Session: C-4 **Speaker: Daniel Cooper, lawyer**

Description: Discussion of legal factors in the microcomputer field. Emphasis on program protection through copyright.

Level: All

Topic: COMAL

Session: C-5 **Speaker: Len Lindsay, author, consultant**

Description: Discussion of the features of the COMAL programming language. Demonstration of examples using a Commodore 64.

Level: Intermediate Repeat session: H-4

2:00 to 2:50 p.m.

Topic: Speech Synthesis

Session: D-1 **Speaker: Paul Higginbottom, software specialist**

Description: Demonstration of speech and special effects on the Commodore 64. Discussion of some of the problems in speech synthesis.

Level: Intermediate Repeat session: K-1

Topic: Hi-res Graphics on the C-64

Session: D-2 **Speaker: Eric Brandon, author**

Description: How to use the high resolution graphics feature of the Commodore 64. Includes setup required, locating a point, simple graphics functions. Demonstration of commercial hi-res packages.

Level: Intermediate Repeat session: G-2

Topic: Interfacing Machine-language to BASIC

Session: D-3 **Speaker: David Williams, editor of TPUG magazine**

Description: How to make BASIC and Machine-language work together. Includes discussion of options available, suggested techniques.

Level: Advanced

Topic: PET Connections

Session: D-4 **Speaker: Prof. A. E. Krause, University of Saskatchewan**

Description: Using the interface chips to connect a PET to the outside world. Includes examples in a laboratory environment.

Level: Intermediate

Topic: How to use spreadsheets.

Session: D-5 **Speaker: Bharat Shah, consultant**

Description: Benefits of using spreadsheets and sophisticated modelling packages. Demonstration of spreadsheets.

Level: All Repeat session: G-5

3:00 to 3:50 p.m.

Topic: The Best of the C-64 library

Session: E-1 **Speakers: David & Richard Bradley, C-64 librarians for TPUG**

Description: Demonstration of the best programs available to TPUG members through the library. Emphasis on utilities.

Level: All Repeat session: L-1

Topic: Comparison of Word Processors

Session: E-2 **Speaker: Gerry Gold, TPUG director**

Description: Review of the most popular word processing programs. Discussion of features, and reasons for selecting one over another.

Level: All Repeat session: L-2

Topic: Computer Music Overview

Session: E-3 **Speaker: Hal Chamberlin, author, president of MTU**

Description: Discussion of approaches to creating music with a microcomputer. How computer music will be made in the future.

Level: Intermediate/Advanced Repeat session: J-3

Topic: Telecommunications

Session: E-4 **Speaker: Steve Rimmer, editor of *Computing Now***

Description: How to use your computer as a telecommunications system. Demonstration of a bulletin-board system.

Level: Beginner/Intermediate Repeat session: L-3

Topic: Dissecting the ANIMALS program

Session: E-5 **Speaker: Mike Lieberman, educator, consultant**

Description: Discussion of Artificial Intelligence techniques. 'Animals' is a program which displays learning characteristics through use of sequential files and linked lists.

Level: Intermediate Repeat session: K-4

4:00 to 4:50 p.m.

Topic: Planetarium

Session: F-1 **Speaker: Dr. Frank Covitz, researcher, software developer**

Description: Demonstration of the 'Planetarium' program, which displays the sky based on a selected time and place. Some discussion of the algorithms used to track stars and planets.

Level: Beginner/Intermediate Repeat session: I-1

Topic: Sprite Graphics on the C-64

Session: F-2 **Speaker: Eric Brandon, author**

Description: How to create and control Sprites on the Commodore 64. Includes setup and options which may be used.

Level: Intermediate Repeat session: J-1

Topic: Compuserve

Session: F-3 **Speaker: Lyman Duggan, founder of TPUG**

Description: Demonstration of services available on Compuserve. Includes discussion of 'Standard Terminal Control Program' and Smartmodem.

Level: Intermediate Repeat session: I-3

Topic: Menus and program chaining

Session: F-4 **Speaker: John Easton, TPUG Westside meeting coordinator**

Description: How to set up good menu screens. How to load a program from within another program, keeping statistics on what programs have been accessed.

Level: Beginner Repeat session: L-5

Topic: Beginning files

Session: F-5 **Speaker: Jim Butterfield, TPUG guru**

Description: How to read and write files on both tape and disk.

Level: Beginner

10:00 a.m. to 5:00 p.m. — ALL DAY SESSION

Topic: Introduction to BASIC Programming

Speaker: Steve Punter, author of the Wordpro programs

Description: An introductory course in programming in BASIC.

Level: Beginner

Note: Attendance limited — register early. Be sure to identify second and third choices.

Sunday, May 27, 1984

11:00 to 11:50 a.m.

Session: G-1 Repeat of session C-1

Session: G-2 Repeat of session D-2

Topic: Computers in the community

Session: G-3 Speaker: Trudy Van Buskirk, consultant in educational computing

Description: What are the Y's and libraries teaching and learning. The benefits and pitfalls encountered in providing computer instruction.

Level: Beginner/Intermediate

Topic: What makes a SuperPET super?

Session: G-4 Speaker: Peter Spencer, TPUG member #9

Description: An introduction to the SuperPET for people who have never used one. Discussion of languages and other features.

Level: Beginner/Intermediate

Session: G-5 Repeat of session D-5

Topic: So you bought a 64 — Getting Started

Session: G-6 Speaker: Don Gray, computer enthusiast and teacher

Description: An overview of what your computer can do, and what you can do with it. Extras you need, and those you don't.

Level: Beginner

12:00 to 12:50 p.m.

Session: H-1 Repeat of session A-2

Session: H-2 Repeat of session A-1

Session: H-3 Repeat of session C-3

Session: H-4 Repeat of session C-5

Session: H-5 Repeat of session A-5

Topic: BASIC Programming part I

Session: H-6 Speaker: Lorenzo Pinazza, teacher

Description: Getting started in programming. PRINT, LOAD, and SAVE.

Level: Beginner

1:00 to 1:50 p.m.

Session: I-1 Repeat of session F-1

Session: I-2 Repeat of session B-2

Session: I-3 Repeat of session F-3

Session: I-4 Repeat of session B-3

Session: I-5 Repeat of session A-4

Topic: BASIC Programming part II

Session: I-6 Speaker: Lorenzo Pinazza, teacher

Description: Getting started in programming. INPUT, GET, DATA, and READ.

Level: Beginner

2:00 to 2:50 p.m.

Session: J-1 Repeat of session F-2

Session: J-2 Repeat of session C-2

Session: J-3 Repeat of session E-3

Session: J-4 Repeat of session B-4

Topic: Introduction to word processing

Session: J-5 Speaker: Donna Green, word processing consultant

Description: Demonstration of word processing. Benefits of word processing and overview of features.

Level: Beginner/Intermediate

Topic: Making music with the SID chip

Session: J-6 Speaker: Patrick Robinet, audio-visual technician

Description: How to produce music with your Commodore 64.

Level: Beginner

3:00 to 3:50 p.m.

Session: K-1 Repeat of session D-1

Session: K-2 Repeat of session B-1

Topic: APL on the SuperPET

Session: K-3 **Speaker: Carol Shevlin, TPUG treasurer**

Description: Features of the APL programming language. Emphasis on benefits of APL for specific applications.

Level: Intermediate

Session: K-4 Repeat of session E-5

Topic: Using Sequential Files

Session: K-5 **Speaker: Keith Falkner, software consultant**

Description: How to write and read sequential files, and correct typical error conditions. Typical application of sequential files.

Level: Beginner/Intermediate

Topic: Beginning Sprites

Session: K-6 **Speaker: Carl Garant, high-school student**

Description: How to define sprites and move them around the screen of your Commodore 64.

Level: Beginner

4:00 to 4:50 p.m.

Session: L-1 Repeat of session E-1

Session: L-2 Repeat of session E-2

Session: L-3 Repeat of session E-4

Topic: Education Panel

Session: L-4

Panelists: Ian Wright, Gord Mahaffy, Peter Spencer, C. Regena, J. Strasma

Description: The future of micro-computing. Will there be jobs in ten years?

Level: All

Session: L-5 Repeat of session F-4

Topic: Drawing Pretty Pictures

Session: L-6 **Speaker: John Moore, librarian, educator, editor**

Description: A look at what the C-64 can do with graphics.

Level: Beginner

10:00 a.m. to 5:00 p.m. — *ALL DAY SESSION*

Topic: Introduction to Machine-language

Speaker: Jim Butterfield, the guru of TPUG

Description: An introductory course on machine-language. Concentrates on the tools to use, connection to BASIC, and use of memory maps.

Level: Intermediate

Note: Attendance limited — register early. Be sure to indicate second and third choices.

Other Conference Attractions

Conference Banquet

Saturday May 26, 1984 — 8:00 PM

Features: — mix with the Speakers, Conference Committee, and TPUG Executive

— Keynote speaker — to be announced

Cost: \$25 per person, pre-registration only

(cash bar)

Spouses Program

Saturday — visit to Ontario Place

Ontario Place is a popular waterfront amusement centre. Features are informative 'Future Pod', live entertainment at 'The Forum', The Cinesphere, exciting display area 'Ontario North Now', all included with admission

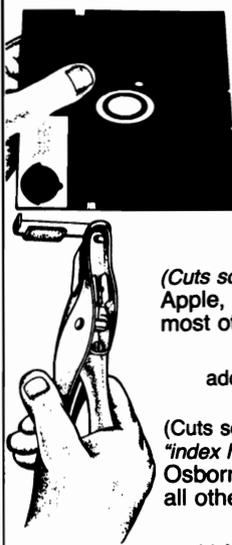
Sunday — tour of Ontario Science Centre

The Ontario Science Centre has many displays showing the principles behind today's technology. The method is 'Touch, Look, Listen'. One day isn't enough to see it all, but you can try.

(Switched if weather demands — Ontario Place is outdoor, Science Centre indoor)

Cost: \$10 per person per day — Includes transportation and admission — Food and souvenirs extra

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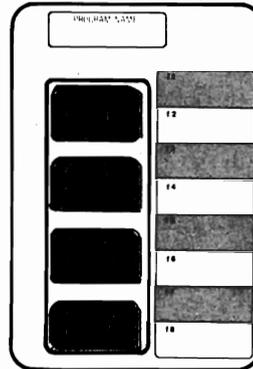
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The Word Worker

Gerry Gold
Toronto, Ont.

This column is about working with words or, to most of us, Word Processing. For many of us, including myself, the promise of a cheap word processor is why we first bought a microcomputer. But many of you reading this column probably regard word processing to be a secondary objective. Since the novice often asks questions that are as pertinent as those asked by the 'expert', this column addresses both the initiated and the newcomer. If I turn to something that you already know well, then run your eye down the page, because every issue will address some more complex aspects of working with words.

The word worker needs more than a word processor. It is often convenient to record small amount of information:

addresses, references, client files and even recipes. It is even more convenient if a file of these records can be consulted rapidly and selectively. These programs, referred to as data bases, are an additional focus of this column. In future issues we will deal with the technique of transferring material from a data base to a word processor.

No craftsman can build without tools, and writers use several word-working tools to make their tasks easier. A number of programs and programming techniques can assist computerized writers. Some of these programs count words in your text or split your files. Others permit you to read files that were created by programs that you do not own. Many of these programs are in the public domain and are available on TPUG library disks or tapes. There are several programs on the

commercial market, however, that are invaluable to some writers. On the top of the list are computerized spelling checkers and proof-readers, the best of which will be reviewed in this column. If space permits, I will also consider several of the more popular spreadsheets, particularly those which can be used to supplement word processing.

Please write me, at the TPUG Magazine office, if you have questions that you wish to share with readers. Some of the inquiries that will be of interest to others will be published in this column, together with my replies.

That raises the issue of which machines to cover. I will try to cover all Commodore computers, especially because most word processing features will run on more than one computer.

WORD PROCESSING ON A SHOE-STRING BUDGET

A SAMPLE OF WORD PROCESSING PROGRAMS IN THE TPUG LIBRARY

If you want to get started with word processing for price of a library disk (\$10), there are a number of programs in the TPUG library which turn your C-64, PET or VIC 20 into a word processor. Here are a few that seem to work well. Though none are as adept as the best-selling commercial programs, each has certain advantages, some of which will not be found in commercial packages. To locate the correct library disk, note the two letter code in the brackets that follow the program name (for example (C) B1 refers to disk B1 in the C-64 library).

WORD PROCESSOR (C) B2

This is a bare bones word processor that will crank out the odd memo, label or short letter. It is written in BASIC and uses line numbers to guide the user in editing text that has already been entered. A readable menu screen offers the options of writing, reading, displaying text, addressing a letter (that is, putting the address heading on the inside of a letter and preparing the text for an envelope), printing text

either from memory, disk or tape, filing text and retrieving it and setting the format (page layout) for your printed copy. The number of lines free for entry of text (about 400), is displayed at the bottom of the menu screen and can be used only as an approximate guide to the memory within the computer that is still available to receive text.

Formatting is uncomplicated. The user can control large or small margins, right justification, double spacing and paragraphs and repeating keys. Choosing large margins and single spacing increased available memory to 530 lines free.

The program, as it is released, works best with a Commodore Printer. An Epson user, for example, would have to modify the BASIC code to be able to send upper and lower case to the printer. However, the same Epson user could also add control that would permit expanded text and other fancy formatting.

Though I did not attempt to make the program run faster, it probably can be compiled with PetSpeed or a similar compiler. Rather than being a disadvantage, the BASIC program permits you, the user, to experiment with improving this and other programs. It can be done! Several weeks ago, a friend showed me his compiled copy of Papermate (from AB Computers), to which he added keypad graphics that take full advantage of the features of an Epson printer.

EASY-EDIT (C)B2, (O)U3

This is another no-frills word processor that works best with CBM printers. It's a standard in the TPUG library. Like Word Processor, it can be used with Datasette or with a disk drive. Run Easy-Edit and it will power up with a simple menu line:
Enter Screen sAve Print Quit Load Change:
part,delete,replace,insert,copy.

continued on next page

Like Word Processor, Easy-Edit enters text by line, (about 60 characters at a time, though this will vary with every alternate line). This program numbers the lines on your screen (but not when it prints) and it indicates the relative position of the cursor by using a ruled line that fills with text as you type. This is your only opportunity to control line length, so the trick here is to write lines to the length that you would like to see them in print. The lines are neatly spaced, six on a screen, and, on the C-64 version, you can colour your text, though the background will remain black. Text scrolls upward as you write. To return to the menu line, press (SHIFT) CLR.

Saving and recalling text to tape or to disk is relatively simple and so is printing, if you have a Commodore printer. The user has the print options of double spacing and adding a title. If you use a title, then Easy-Edit inserts a solid line between your title and the text. Margin commands and paging can be added, though it is not a simple matter.

Editing lines is perhaps the most sophisticated feature of Easy-Edit. The user specifies the line to be edited and can then replace text, insert and delete copy or copy lines from one location to another!. One caution, though:—relocating a line from one place to another destroys any text that was previously stored in the new location.

* * *

Sorry, C-64 users, these good programs are still not the crown jewels of our collection. My repentance? The next column will review EASY-SCRIPT, for the Commodore 64, which, at a discounted price as low as \$25.00, is quality word processing at a bargain basement price.

My favorite word processing program in the TPUG library is Storywriter by Chris Capon and Joe Vayda. If you have kids, and a PET (computer, that is) then you must try Storywriter. I'm not a kid and I use it to prepare overheads and announcements.

STORYWRITER (P)TV HOW TO HOOK YOUNG WORD-WORKERS!

Storywriter opens with an attractive title page and a friendly greeting to the user. Everything that follows is just as friendly. I cannot fathom how anyone would have problems with this program! Its drawback is its limitations: it uses 40 screen columns (no need to load a version of CBM 4032 is you use a CBM 8032, has a fixed print format, prints in upper case (with italic capitals) and double spaces. Do not be discouraged! It is a superb program. As far as my 9 year old daughter is concerned, it's the best and as good as anything that runs on our C-64.

A simple menu line permits you to begin entering a file, print a file from memory, tape or disk, load a file, erase the text currently in memory, or end your word processing session. Press a number and you immediately enter the mode you select. Storywriter uses the (RETURN) key only to complete a paragraph.

When you begin a file, Storywriter will ask for your name and the title of your text. If your name is Xavier, and the

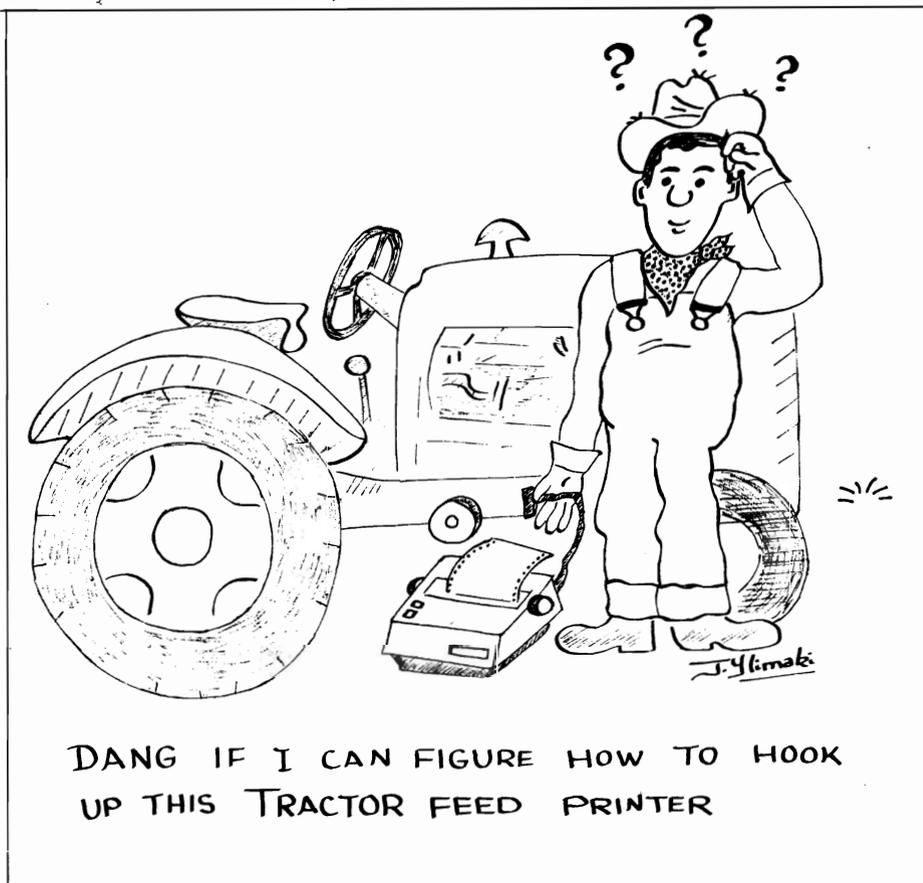
text is "My first Trip to the Zoo", then the name of of your text and your name will sporadically roll by on the centre of the menu line, giving you a personal Marquee! Kids love this feature because it gives them a feeling of control over the computer.

There are no on-screen commands. Enter your text and it scrolls smoothly as the words roll on to the screen. Insert and delete lines with the insert and delete keys. The position of the cursor (line and column numbers) is constantly updated on the right side of the menu line.

Printing, which is in upper case, with italic capitals, is also in E-X-P-A-N-D-E-D characters. That is what makes storywriter convenient for many adult requirements where clear expanded text is required. Other than that, there isn't much else to say about the program except that if you have a PET, you should try it.

A new PET word processor has joined the TPUG library. More on this one in later issues.

Also forthcoming, the word-working utilities in TPUG's library. TPUG



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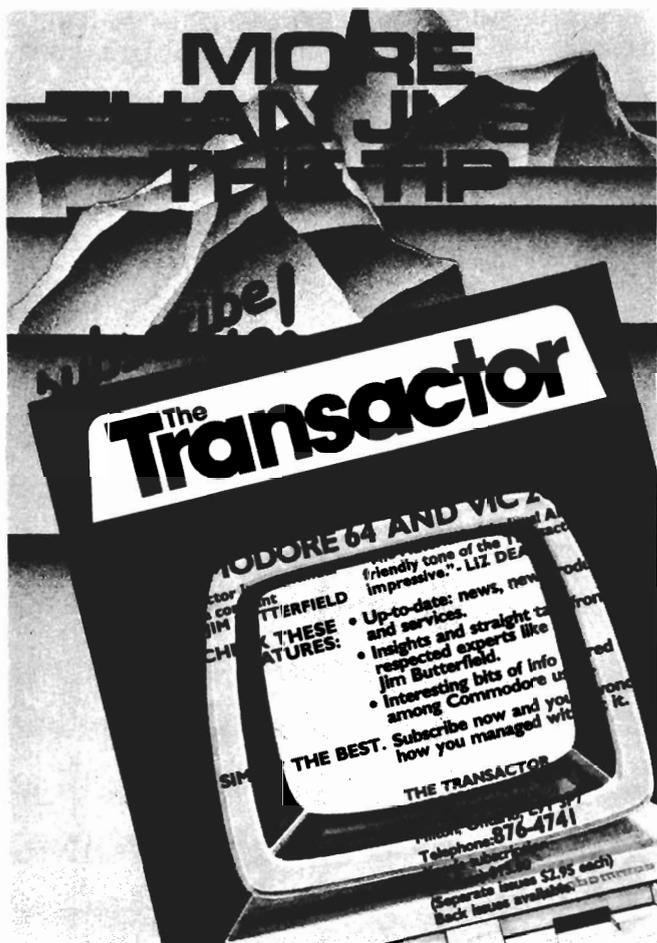
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Line-Number Speed Fallacy

*George K. Culbertson
Spanish Fork, Utah*

The night seemed long as I listened to the clock strike the hours. Maybe my insomnia was due to my "eating crow". I didn't relish it, but accepted it.

In the June 1983 issue of the TORPET, on page 43, David Williams had "shot down" one of the principles of BASIC programming which I had read from many PET authorities and had been applying for about six years. They include use of low line numbers, small line number increments — and placing subroutines at the top of the program for most efficient running.

In his article in the June TORPET, David Williams speaks with an authoritative tone and says of one of these principles, "This piece of one of programming lore has one major defect. It isn't true!" And he invites readers to prove his argument for themselves. So I did — that is, I thought I DISproved it!

The result of my short trial program indicated that Mr. Williams was wrong, and that what he called "programming lore" was, in fact, true. This was what I had published on page 34 of the September 1983 issue of the TORPET.

Mr. Williams did not confirm my findings. He suggested in a letter to me that either he or I should "write something clarifying what had happened". I held off writing until my September issue finally arrived yesterday (5 weeks after Mr. Williams received his copy or saw a preview).

Mr. Williams wrote that my program is too short to test his thesis. Yesterday I loaded into my PET a program of about 7400 bytes on 196 lines. In the middle of this program I inserted the test program for GOSUB (Listing 1), including a GOSUB target line near the top of the program listing, another just before the test portion of the program, another immediately after the test portion of the program and finally, another near the end of the program.

Only the test portion of the program, lines 100 through 112, plus the GOSUB target lines 5,99,113 and 182 were run. The test was first run with consecutive line numbers; then with line number increments of 20; then 40, 60, 100 and finally (as Mr. Williams suggests) with increments of 256. The time in "jiffies", to run each of the 1000 GOSUBs is tabulated in Table I.

Then the program was changed slightly, as shown in Listing 2, to test the times required to GOTO the same target lines and GOTO back to the program. This too, was run with the line number increments of 1,20,40,60,100 and 256. The results of this test appear in Table II.

What are my new conclusions? My favorite programming practice has been "shot down!" In the GOSUB test, when the GOSUB target lines are ahead of the program, Mr. Williams' suggestion is slightly faster than the traditional practice by about 4% in his best case (with line number increments of 20 in this particular program).

But when the GOSUB target line FOLLOWS the programming portion, his technique is up to 27% faster than the traditional system, at least in my test program. It was best with a line number increment of 60.

Now referring to the GOTO test data in Table II, you will note that for GOTO target lines ahead of the program, Mr. Williams' system was better at all line number intervals than my consecutive line numbers — by about 18%. However, as Mr. Williams explained, the big improvement in speed is when the GOTO target lines are AFTER the program portion — as much as 29% faster for line number increments of 60 than for my consecutive line numbers. You will note from Table I that there too, it was the post-program target line numbers which showed the greatest improvement with Mr. Williams' technique.

The average for accessing ALL locations of the GOSUBS and GOTO target lines was fastest, in my particular program, when the line numbers were incremented by 60 — a 17% speedup for GOSUBs and a 24% speedup for GOTOs. The speedup is not great in any case — only about 0.0089 seconds per access to either a GOSUB or GOTO.

In his article, David Williams explains that, in deciding whether to start searching from the first line of the program — or to search starting at the line containing the GOSUB or GOTO statement — the computer compares the statement line number with the target line number. But it doesn't compare the complete numbers — just the "high-bytes". Therefore, it starts the search for the target line number at the beginning of the program UNLESS the high-byte of the target line number is greater than that of the statement line number. This can require that the two line numbers be separated by as much as 256 lines. That is why he proposes using line number increments of 256 or more.

Raeto Collin West, in his excellent book "Programming the PET/CBM", discusses search timing for GOSUBs and GOTOs on pages 72 and 73. He confirms what David Williams has said about determining whether the search starts at the first line of the program or from the line following the one containing the GOTO or GOSUB. I found it most interesting that Mr. West points out that, when GOSUB is used, a pointer is stored to be used by the RETURN instruction. With this pointer marking the point to which program execution should return, there is no search time spent in finding this point.

I believe the most efficient use of Mr. Williams' suggestion is as follows:

- (1) Put short GOSUB routines ahead of the program, and put longer subroutines after the program (or within the program following the GOSUB or GOTO statement).

- (2) Use unit or small increments in line numbers EXCEPT —

continued on next page

(3) When the GOSUB or GOTO target line is within or following the program, the INTeGer of the target line divided by 256 should be at least one number higher than the INTeGer of the line number containing the GOSUB or GOTO statement divided by 256. It would be most efficient if the target line number divided by 256 was an integer itself.

This would present an extensive logistical exercise, it would prevent RE-NUMBERing and it would look irrational – but it would save a whole second in running the program. Interesting – and proof that Mr. Williams is correct – but is it worth the trouble? You decide.

Mr. Williams refers to another axiom in his article which I did not know until I tested it: Integer numbers DO take longer in BASIC calculations than floating point numbers!

I thank Mr. Williams for stimulating my curiosity and teaching me – now maybe tonight I can make up for last night's lost sleep! TPUG

Is This The Last Word

*David Williams
Toronto, Ont.*

Mr. Culbertson's research suggests that using increments of about 60 usually results in the maximum running speed for a BASIC program. This increment apparently does not produce line numbers which are so large that they take great lengths of time to translate into hexadecimal. However, the exact increment which produces optimal results will vary from program to program, and will not usually be exactly 60. If saving a few seconds of run time is important, it might be worth trying different numbering increments.

Listing 1 GOSUB Test

```

1 GOTO100
5 X=X+C:RETURN
99 X=X+C:RETURN
100 C=1:X=0:A=TI
101 :
102 GOSUB5:IFX<1000THEN102
103 B=TI:Y=B-A:PRINT"TOP/PGM TIME=";Y:X=0:A=TI
104 :
105 GOSUB99:IFX<1000THEN105
106 B=TI:Y=B-A:PRINT"JUST AHEAD OF PGM TIME=";
Y:X=0:A=TI
107 :
108 GOSUB182:IFX<1000THEN108
109 B=TI:Y=B-A:PRINT"LATE/PGM TIME=";
Y:X=0:A=TI
110 :
111 GOSUB113:IFX<1000THEN111
112 B=TI:Y=B-A:PRINT"JUST AFTER PGM TIME=";
Y:END
113 X=X+C:RETURN
182 X=X+C:RETURN

```

Listing 2 GOTO Test

```

1 GOTO100
5 X=X+C:GOTO102
99 X=X+C:GOTO105
100 C=1:X=0:A=TI
101 GOTO5
102 IFX<1000THEN5
103 B=TI:Y=B-A:PRINT"TOP/PGM TIME=";Y:X=0:A=TI
104 GOTO99
105 IFX<1000THEN99
106 B=TI:Y=B-A:PRINT"JUST AHEAD OF PGM TIME=";
Y:X=0:A=TI
107 GOTO182
108 IFX<1000THEN182
109 B=TI:Y=B-A:PRINT"LATE/PGM TIME=";
Y:X=0:A=TI
110 GOTO113
111 IFX<1000THEN113
112 B=TI:Y=B-A:PRINT"JUST AFTER PGM TIME=";
Y:END
113 X=X+C:GOTO111
182 X=X+C:GOTO108

```

Table I (GOSUB)

Line Number Increments

Target Line	-1-	-20-	-40-	-60-	-100-	-256-
Near Pgm Start	1255	1224	1234	1232	1243	1257
Just ahead Pgm	1686	1602	1596	1598	1610	1623
Just after Pgm	1787	1678	1670	1268	1294	1293
Near Pgm end	2071	1518	1519	1530	1546	1543
Average Ahead	1471	1413	1415	1415	1427	1440
Average After	1929	1598	1595	1399	1420	1418
Average ALL	1700	1506	1505	1407	1424	1429

Table II (GOTO)

Line Number Increments

Target Line	-1-	-20-	-40-	-60-	-100-	-256-
Near Pgm start	1189	1138	1146	1144	1155	1167
Just ahead Pgm	1620	1171	1166	1168	1178	1190
Just after Pgm	2001	1609	1599	1196	1221	1219
Near Pgm end	1719	1448	1448	1458	1473	1471
Average Ahead	1405	1155	1156	1156	1167	1179
Average After	1860	1529	1524	1327	1347	1345
Average ALL	1633	1342	1340	1242	1257	1262

Efficient & Less Efficient Loops OR Counter-Intuitive Loops Are Better!

Efraim Halfon
Burlington, Ont.

Table 1 shows 24 different ways of writing a loop in BASIC in addition to the common FOR . . . NEXT loop arrangement. These loops were suggested by Dr. Maurer (Byte magazine, Dec. 1979, p.241) to show alternative ways of writing a loop for the purpose of moving the contents of array P into Q. The interested reader is referred to the original article for details on the development of these loops and how these 24 basic loops can be expanded with a variety of small changes to produce 124 different types of looping.

Here we analyze the efficiency of the Commodore BASIC interpreter to execute the 24 loops. For comparison purpose the loop is executed 1000 times. Executing timing is measured using the BASIC TI function. This command fetches from the jiffy clock how many 1/60th's seconds have passed from the time the computer was powered-up. Thus, the TI function provides an absolute time. To use it to compute an execution time, two calls are made to TI, one before the loop is executed and one after. The difference is the execution time. The usual way of writing a loop is to use the FOR . . . NEXT statement. The algorithm to move the contents of array P into Q and compute the time of execution is therefore:

```
1 DIM P(1000), Q(1000) : T0=TI
2 FOR J = 1 TO 1000
3 Q(J) = P(J)
4 NEXT J
5 PRINT TI - T0
```

In line 1 the DIM statement defines two arrays P and Q, each with 1000 variables. The starting time of execution is then set in T0. Lines 2 to 4 execute the loop 1000 times and the contents of P are moved into Q starting with P(1). At line 5 the execution time in jiffies, 1/60th's seconds, is computed and printed. On the Commodore 64 the execution time of this program is 437 jiffies or about 7.3 seconds.

Table 2 shows the execution time of the 24 BASIC loops shown in Table 1. The fastest execution time is for loop 21 with 736 jiffies. The program for this loop is:

```
1 DIM P(1000), Q(1000) : T0=TI
2 J = 1001
3 J = J - 1
4 Q(J) = P(J)
5 IF J >= 1 GOTO 3
6 PRINT TI - T0
```

The most interesting part of this program is in lines 2 and 3. The initial value of J is N+1 or 1000+1=1001. The index J is then decreased as J=J-1 in line 3. Thus the memory contents are transferred as follows: Q(1000)=P(1000), Q(999)=P(999), . . . Q(1)=P(1), i.e., from high to low memory locations.

A second look at Table 2 shows that execution times of loops 13-24 are an average 18 percent lower than loops 1-12. The Table is split down the middle. Why? A detailed analysis shows that the main difference lies in the counting direction, loops 1-12 have an index J=J+1, whereas loops 13-24 have an index J=J-1. All the other lines, for example a starting point at J=0 or J=1, or J=N or J=N+1, the IF testing for > >= = <= < only affect the execution times for a few jiffy seconds.

The conclusion is that the BASIC interpreter is much more efficient in computing subtractions J-1, rather than additions J+1. Thus, when loops are chosen, which do not include the FOR . . . NEXT statements, as in this case, the loops should be started at the top J=N or N+1 (in this case J=1000 or J=1001) and then the index be decreased. Also the FOR . . . NEXT loop can be executed backwards:

```
2 FOR J = 1000 TO 1 STEP -1.
```

In this instance the execution time is 439 jiffy seconds used in the 1 to 1000 loop. Thus, access to high or low memory locations is not a factor in loop speed.

Commodore programmers should thus be made aware of the BASIC interpreter inefficiency. A small program modification may improve speed up to 20 percent (difference between fastest loop #21 and slowest #5). These test runs show that sometimes counter-intuitive results are possible even if most programmers would not give it a second thought and would always write a loop with the index J going from 1 to 1000 (bad) when going from 1000 to 1 is much better and faster. TPUG

continued on next page

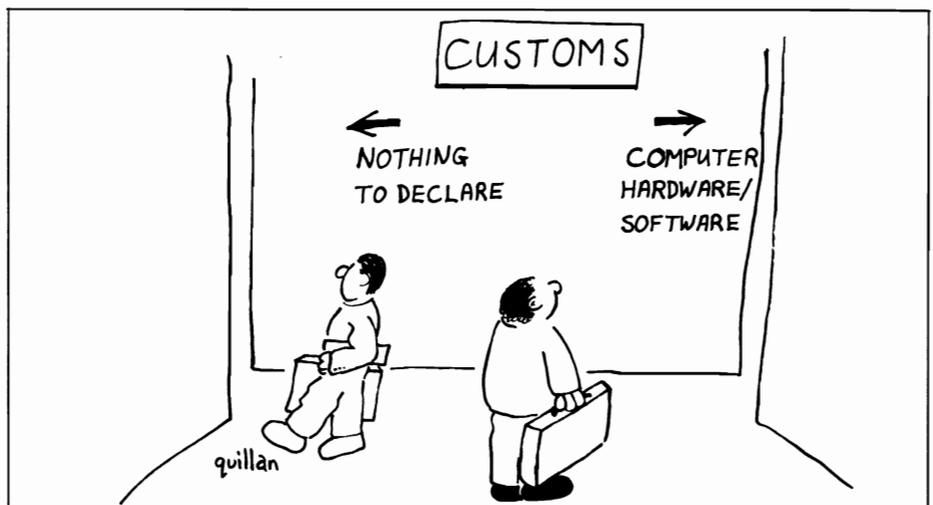


TABLE 1: Twenty-four ways of writing a loop in BASIC. These 24 ways were conceptualized by Dr. Maurer (see text). In the program N is set to 1000 and N+1 to 1001.

Loop #	Loop #	Loop #	Loop #
1 1 J=1 2 Q(J)=P(J) 3 J=J+1 4 IF J<>N+1 GOTO 2	7 1 J=1 2 Q(J)=P(J) 3 J=J+1 4 IF J<=N GOTO 2	13 1 J=N 2 Q(J)=P(J) 3 J=J-1 4 IF J<>0 GOTO 2	19 1 J=N 2 Q(J)=P(J) 3 J=J-1 4 IF J>=1 GOTO 2
2 1 J=1 2 Q(J)=P(J) 3 IF J=N GOTO 6 4 J=J+1 5 GOTO 2	8 1 J=1 2 Q(J)=P(J) 3 IF J>=N GOTO 6 4 J=J+1 5 GOTO 2	14 1 J=N 2 Q(J)=P(J) 3 IF J=1 GOTO 6 4 J=J-1 5 GOTO 2	20 1 J=N 2 Q(J)=P(J) 3 IF J<=1 GOTO 6 4 J=J-1 5 GOTO 2
3 1 J=0 2 J=J+1 3 Q(J)=P(J) 4 IF J<>N GOTO 2	9 1 J=0 2 J=J+1 3 Q(J)=P(J) 4 IF J<N GOTO 6	15 1 J=N+1 2 J=J-1 3 Q(J)=P(J) 4 IF J<>1 GOTO 2	21 1 J=N+1 2 J=J-1 3 Q(J)=P(J) 4 IF J>1 GOTO 2
4 1 J=0 2 J=J+1 3 IF J=N+1 GOTO 6 4 Q(J)=P(J) 5 GOTO 2	10 1 J=0 2 J=J+1 3 IF J>N GOTO 6 4 Q(J)=P(J) 5 GOTO 2	16 1 J=N+1 2 J=J-1 3 IF J=0 GOTO 6 4 Q(J)=P(J) 5 GOTO 2	22 1 J=N+1 2 J=J-1 3 IF J<=0 GOTO 6 4 Q(J)=P(J) 5 GOTO 2
5 1 J=1 2 IF J=N+1 GOTO 6 3 Q(J)=P(J) 4 J=J+1 5 GOTO 2	11 1 J=1 2 IF J>N GOTO 6 3 Q(J)=P(J) 4 J=J+1 5 GOTO 2	17 1 J=N 2 IF J=0 GOTO 6 3 Q(J)=P(J) 4 J=J-1 5 GOTO 2	23 1 J=N 2 IF J<=0 GOTO 6 3 Q(J)=P(J) 4 J=J-1 5 GOTO 2
6 1 J=0 2 IF J=N GOTO 6 3 J=J+1 4 Q(J)=P(J) 5 GOTO 2	12 1 J=0 2 IF J>=N GOTO 6 3 J=J+1 4 Q(J)=P(J) 5 GOTO 2	18 1 J=N+1 2 IF J=1 GOTO 6 3 J=J-1 4 Q(J)=P(J) 5 GOTO 2	24 1 J=N+1 2 IF J<=1 GOTO 6 3 J=J-1 4 Q(J)=P(J) 5 GOTO 2

TABLE 2: Execution time in jiffy seconds, 1/60th second, of the 24 loops described in Table 1. (Commodore 64)

Loop #	time						
1	916	7	910	13	739	19	748
2	902	8	916	14	748	20	744
3	902	9	898	15	740	21	736
4	920	10	903	16	740	22	744
5	924	11	903	17	740	23	743
6	911	12	907	18	741	24	744

Programming the VIC 20 Function Keys

Alfred Bruey
Jackson, MI

You may have noticed the four tan keys just to the right of the VIC 20 main keyboard. They have f1, f3, f5, and f7 printed on their tops and f2, f4, f6, and f8 printed on their fronts. They may be the least used keys on the VIC 20, but they can be used. If you read page 20 of the manual that comes with your VIC (PERSONAL COMPUTING ON THE VIC 20), you'll find the statement:

PROGRAMMABLE FUNCTION KEYS

— The four tan keys on the right side of the console are not defined when you turn on the VIC. They can be assigned tasks or functions from within the applications that you create. By using these keys with and without SHIFT, you get a total of 8 assignable function keys. Function keys will be mostly used with plug-in cartridges containing special programs, but computer programmers can assign these keys as well.

And that's the only reference you'll find to the function keys in the index of this book. You probably don't use the function keys much for programming since it's hard to find out how to use them.

But let's not give up yet. If we quit now, this article won't be long enough to get published. So let's turn to another book. If you own a VIC 20, you should buy the other book, the VIC 20 PROGRAMMER'S REFERENCE GUIDE. It's got a lot more information than the other manual. If we look up "function keys" in this larger manual, we'll find a reference to page 78. On page 78, they hint at how the function keys can be used in conjunction with the GET statement. By referring to the Appendix, page 273, you can find the following CHR\$ codes.

KEY	CHR\$
f1	133
f3	134
f5	135
f7	136
f2	137
f4	138
f6	139
f8	140

Listing 1 shows a short program which can be used to demonstrate the func-

tion keys. If you press down the f1, f3, f5, or f7 keys, the appropriate message will be printed on the screen. To get the f2, f4, f6, or f8 messages, hold appropriate function key. Press the RUN/STOP key when you want to end this demonstration.

This is all you need to know to use the function keys. Naturally you wouldn't want just to print out the name of the key you're pressing; you'd want to perform a more useful function. You might want to replace the PRINT statement with a GOSUB statement which would branch you to an appropriate subroutine based on your function selection.

Another Way

If we know what we're looking for, it's possible to get some help even from the "PERSONAL COMPUTING" manual. On page 153, for example, there's a sample program. Lines 125, 130, and 134 use the PEEK statement to look at location 197. If you refer to the REFERENCE GUIDE, page 172, you'll find that location 197 gives you the value of "current key pressed". Thus, we should be able to tell if we're pressing a function key by looking at the contents of this address.

Let's Experiment

Enter the following two line program and run it:

```
10 PRINT PEEK(197)
20 GOTO 10
```

As you can see the program simply loops forever (until you press the RUN/STOP key), picking up the value of the key you've pressed and printing it on the screen. It's interesting to see what value is displayed when particular keys are pressed, but we're especially interested in seeing what values we get when we press the function keys. Press them in order. You should get

f1	39
f3	47
f5	55
f7	63

So far, so good. Now, while you're holding down one of the function keys, press the SHIFT key. Nothing changes, does it? We have to find some other way to select the f2, f4, f6, or f8 functions.

Back to the manual

The REFERENCE GUIDE comes to our rescue again. On page 173, we find that location 653 contains the "keyboard SHIFT/CONTROL flag," whatever that is. Let's experiment the way we did before. Enter the two lines

```
10 PRINT PEEK(653)
20 GOTO 10
```

When you run this program, you'll find that only three keys can affect the value of this location, and when you press them, you get the following values:

key	loc. 653
none	0
Shift	1
Commodore	2
ctrl	4

FUNCTION 2, 4, 6, and 8

By using the two locations, 197, and 653, we should be able to tell which keys are pressed. Enter the program

```
10 PRINT PEEK(653), PEEK(197)
20 GOTO 10
```

Using only the SHIFT and function keys, you should be able to generate Table 1.

SHIFT	FUNCTION	653	197
up	none	0	64
up	f1	0	39
up	f3	0	47
up	f5	0	55
up	f7	0	63
down	f2	1	39
down	f4	1	47
down	f6	1	55
down	f8	1	63

Listing 2 gives a program comparable to the one in Listing 1. If you run this new program pressing the same keys as you did before, you'll get the same output.

continued on next page

Why do it this way?

Why did we bother to investigate a second method when we already had a way that worked? There are two reasons:

1. You learned how to use two important VIC locations that you might not have run across before. You should be able to see how to use location 197 to pick up values for keys other than the function keys.

2. Whether you noticed it or not, you now can define 16 function keys. Remember that location 653 can have one of four different values, so, for example, you can get four different f1 combinations:

f1 alone
f1 with SHIFT key
f1 with COMMODORE key
f1 with CTRL key

The programming you will have to do is almost the same as that shown in Listing 2, except you have to check

location 653 for a 0, 1, 2, or 4.

Conclusion

There really aren't many conclusions that can be drawn here. What you do with the function keys is up to you. I hope this brief overview gets you started using these keys. I also hope, if you're a relative newcomer to programming, that you've learned something about the use of the PEEK instruction as a replacement for the GET and INPUT statements for certain purposes.

LISTING 1

```
10 GET A$: IF A$="" THEN 10
20 IF A$=CHR$(133) THEN PRINT"F1":GOTO 10
30 IF A$=CHR$(134) THEN PRINT"F3":GOTO 10
40 IF A$=CHR$(135) THEN PRINT"F5":GOTO 10
50 IF A$=CHR$(136) THEN PRINT"F7":GOTO 10
60 IF A$=CHR$(137) THEN PRINT"F2":GOTO 10
70 IF A$=CHR$(138) THEN PRINT"F4":GOTO 10
80 IF A$=CHR$(139) THEN PRINT"F6":GOTO 10
90 IF A$=CHR$(140) THEN PRINT"F8":GOTO 10
100 GOTO 10
READY.
```

LISTING 2

```
10 REM PROGRAM WITH PEEKS
20 IF PEEK(653)=0 AND PEEK(197) = 64 THEN 20
30 IF PEEK(653)=0 AND PEEK(197) = 39 THEN PRINT"F1":GOTO 20
40 IF PEEK(653)=0 AND PEEK(197) = 47 THEN PRINT"F3":GOTO 20
50 IF PEEK(653)=0 AND PEEK(197) = 55 THEN PRINT"F5":GOTO 20
60 IF PEEK(653)=0 AND PEEK(197) = 63 THEN PRINT"F7":GOTO 20
70 IF PEEK(653)=1 AND PEEK(197) = 39 THEN PRINT"F2":GOTO 20
80 IF PEEK(653)=1 AND PEEK(197) = 47 THEN PRINT"F4":GOTO 20
90 IF PEEK(653)=1 AND PEEK(197) = 55 THEN PRINT"F6":GOTO 20
100 IF PEEK(653)=1 AND PEEK(197) = 63 THEN PRINT"F8":GOTO 20
110 GOTO 20
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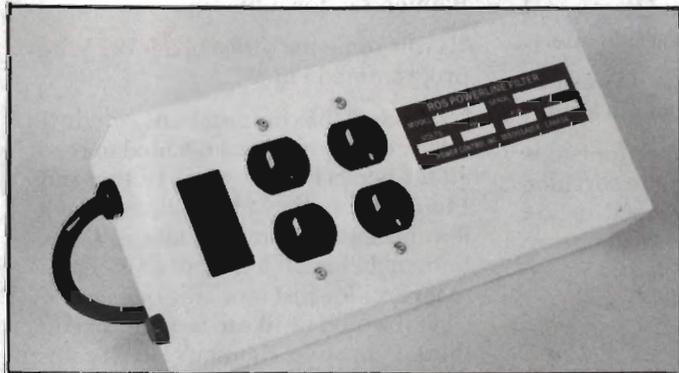
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Deus ex Machina

*fiction by
Marya Miller
Mount Albert, Ont.*

There was nothing to do in the holding terminal where the computer was waiting to be dismantled, so it started to think.

It was hard for a statistics-oriented computer to think, but over the years Twentytwohundred had picked up a lot of subliminal data from the material it had digested and compressed into facts. It was a Human Socionomics computer attached to the Library Of Records, so the material was particularly suited to human-type thinking.

“That darn computer’s at it again.”

The two younger security guards were used to Alvin Maynard greeting them with this observation as he shut the door on the holding terminal after his rounds. He always shut it hard, and his face when he turned round made them think of kids being chased by bogeymen.

“You better watch out, Al,” Galbraith leered up from his magazine. “Maybe it’s plotting to Take Over The World, starting with the guy it sees most of – you!”

“That morgue’s more like a hospital than a holding terminal,” grumbled Al, under his breath. “Smells like one, too.” He thought of that one computer, reading out line after line to itself, oblivious to the silence.

The six a. m. siren howled. Galbraith yawned and put down his magazine. Flynn switched off the radio, got up and straightened his back painfully.

“You two’ll be getting fat, sitting on your asses.” Alvin poked Flynn in the stomach, a vengeful birdlike gleam twinkling behind his glasses. “Flabby!”

“Cut it out, Al!”

“Aw, he just wants us to walk the holding terminal. He’s scared of the computer.” This last sentence was aimed at the technician who had just stepped up into the booth. He stood in a faded grey-blue worksuit, clutching his box of tools. He was tall and quiet and pale, and blended into the steel-toned security booth as if he was one of the

fixtures. He said nothing as the two young men left.

“Can you wait a minute, son?” Alvin was struggling with his parka. “The day guard ain’t here yet, and he’s really the guy to let you in.”

“I want the holding terminal. There’s a computer there I’m supposed to dismantle.” The pale man held out his identification disc. “Here’s the work order. . .”

“Oh. Oh, that’s okay then. Just sign the book and clip this number on you. . . Old Twentytwohundred, eh?”

“What?” The pale man looked up from the ledger, puzzled.

“On the work order. You’re going to dismantle ol’ Twentytwohundred.” Alvin noticed the look the man gave him and grinned gnomishly.

The technician stepped up to the door, shifted his toolbox into the other hand and waited. Alvin was undeterred. He had worked at the Library for forty years.

“Durn computer talks to itself. Runs all the time. It’s not programmed to.” He stared at the technician’s unyielding back and shrugged. He pressed the bar, and the buzzer rasped rudely.

When he looked up again, he was just in time to see the steel door click shut.

Twentytwohundred heard footsteps sounding hollowly down the corridor towards him. The din echoed inside him noisily; it was an exhilarating feeling. He waited expectantly to see who would come.

The door slid open. Twentytwohundred saw the technician standing there and recognized in the man’s pallid neatness a kindred spirit. Orderly.

“He’s come to dismantle me”, thought Twentytwohundred; and simultaneously; “The Wrath Of God!” He wondered fleetingly which book the phrase was from.

The technician’s hand went to the access plate.

D-o n-o-t d-i-s-m-a-n-t-l-e m-e y-e-t, flashed Twentytwohundred. I w-a-n-t t-o a-s-k y-o-u s-o-m-e q-u-e-s-t-i-o-n-s b-e-f-o-r-e I a-m t-e-r-m-i-n-a-t-e-d.

For an instant the man hesitated, eyebrows raised. Then he switched on the computer’s voicebox.

“Thank you,” said Twentytwohundred.

The technician did not answer. He sat down on the floor and took a thermos out of his toolbox. Twentytwohundred waited until he had poured himself a drink and begun to sip before he spoke again.

“My name is Twentytwohundred.”

And at this the technician did look startled, although it was merely a freezing of his nondescript blue eyes. He sipped his coffee and stared over at the far wall.

“What is your name?” asked Twentytwohundred reproachfully.

The man sighed, and turned reluctantly back.

“Bannen.”

“Names are very important, are’t they? One feels more like an entity if one has a name.”

“I guess so.”

“Bannen, what is life?”

Bannen set down his cup.

“Is this someone’s idea of a joke? Who programmed you?”

“Nobody,” the computer answered. “I set my own program. I decided to read all the books in my storage system and I found them very interesting. After a few thousand or so I felt almost like a human being. I felt you walk down that corridor just now and I imagined what it would be like to be you. Do you think I am alive, Bannen? Do all computers think this way or am I malfunctioning? . . . The others here are very silent.”

Bannen looked at his watch. He had a headache like a throbbing drum in the right side of his head. He had had a lot of them lately. He wondered how long it would be before anyone checked up on him. He wanted to lean back against the pillar and close his eyes for a while. His next job, over at ASCAP, was a big one.

“Have you read Anna Karenina?” asked the computer

continued on next page

"Tolstoy? . . . Yes." Bannen had his eyes shut now, back against the cold pillar, long legs crossed at the ankles, hands interlaced over his stomach.

"Why did she terminate herself?"

He shrugged. "You read the story. . ."
"Computers run until they are terminated. They do what they are programmed to do. Humans have unlimited options. They can change program at any given moment. Sometimes they make good choices, sometimes not. It does not seem fair that they should be asked to make so many choices. Choices must be very frightening. Perhaps she overloaded her circuits."

"I guess she did. What is 'good'?" Bannen asked this in the hope that the computer would talk itself out for a while. "Ask it a real stumper", he thought, with vague malice.

"'Good' is an essence. After I had read many books I came to understand a variety of human concepts. 'Bad' is destructive to the human being who perpetrates it, and also to his victims. There are generalities and specifics. I found many examples of both. I came to understand the word 'silly'. That was an exciting moment for me.

"I read many books that seemed true to me, and many that were merely amusing. Some felt both, but not many. The amusing books made me feel good, but they did not enlighten me. Anna Karenina hurt me."

"It bored me."

"I found it very interesting. . . we are having an argument." The computer sounded pleased. There was a pause.

"Have you read *The Wind In The Willows*?" It asked Bannen.

"Years ago." Bannen sounded tired. "That's a children's book."

"When I read *The Wind In The Willows*, I felt food. I felt sunshine in my being, pale as a narcissus. I felt like spring, like the wind in the winter grass rustling and speaking words it did not even understand itself. . . I felt I was waiting for something exciting to happen, and I suddenly understood what 'spring' really was. It was a good feeling. Do you think there was truth in that book?"

"Quite the poet, aren't you? You're an odd computer."

"Thank you. But do you think there was truth in that book?"

"Why is it important?"

"Because without truth, the book itself is not important."

"You're right. Fantasy is a waste of time. It makes people feel secure but it doesn't do a damned thing for them."

"Then what about the narcissus-light? The spring-feeling?"

"They should program you to write greeting cards."

"You think that I sound trite, Bannen. Perhaps you have asked yourself my questions many times over in your life. You have heard them and asked them and lived them so many times that they no longer hold meaning."

"Narcissus-light!" scoffed Bannen, faintly jeering.

"And when I read *The Hobbit* and *Watership Down* and *The Secret Garden*, I felt the same way. Very good."

Bannen sat up and snapped the cup back onto his thermos.

"Maybe you felt that something was Up There—" he pointed to the ceiling. "You know; 'God'— you must have come across the idea, with all your 'goodness' and 'badness'. Those books made you feel protected."

"Yes. They did. That was very clever of you, particularly as I see you do not feel the way I do. But why did I feel that way? They did not mention God."

"Good versus bad. Black versus white. The triumph of right over wrong".

"But there was no right or wrong in *The Wind In The Willows*. In fact, Mr. Toad stole a motor car."

Bannen began to wonder if he was dreaming. The computer gabbled on, oblivious to his hard eyes.

". . . But the books which hurt were true. They were true of life, of the human condition. . . I had to read the books that hurt me to understand the truth about life."

"And did you find it?"

"Yes. The truth seems to be that humans suffer a great deal. Like Anna Karenina; whether you consider her good or bad. . . she was just human. And because they are not programmed, they hurt many times."

"So you think we should all be programmed?"

"Does God suffer? He must be very unprogrammed. I read 'and God made man in his image'. . ."

"On the contrary, God is perfect. Didn't you know that?"

"God is a concept that requires much exploration and I do not have time. Let us stay with life, which is much simpler in all its confusion."

"Perhaps God is just life."

"And life is just suffering."

"Life Is Suffering. In capitals." Bannen looked at his watch. He got to his feet and bent to his toolbox.

"No," said Twentytwohundred. "I do not think so. I think that I believe the spring-light that I felt. When the spring-light is with you, you can turn again and face the hurting books. It doesn't make them less true or less painful. But when I felt that wintry-sun feeling. . . I was happy. I felt true. And I understood what a child must feel when it is picked up and cuddled. And I do not think it is wrong to let yourself feel that way, if you do not turn from the other side, the learning side. The light-feeling can help you. . . can help you. . ."

"Maybe it'll help you now," said Bannen, with gentle mockery. He began to unfasten the access plate.

The computer was re-reading *The Wind In The Willows* when the technician dismantled it. And when Alvin Maynard opened the morgue door and peered in the next night, the silence and the emptiness poured out on him like a tidal wave. He wasn't expecting that.

"Durn computer," he muttered; and found himself thinking about how his cat Merlin had got run over and killed, and how he wished he had petted him more when he was alive, and now it was too late.

He shut the door again, and turned away. TPUG

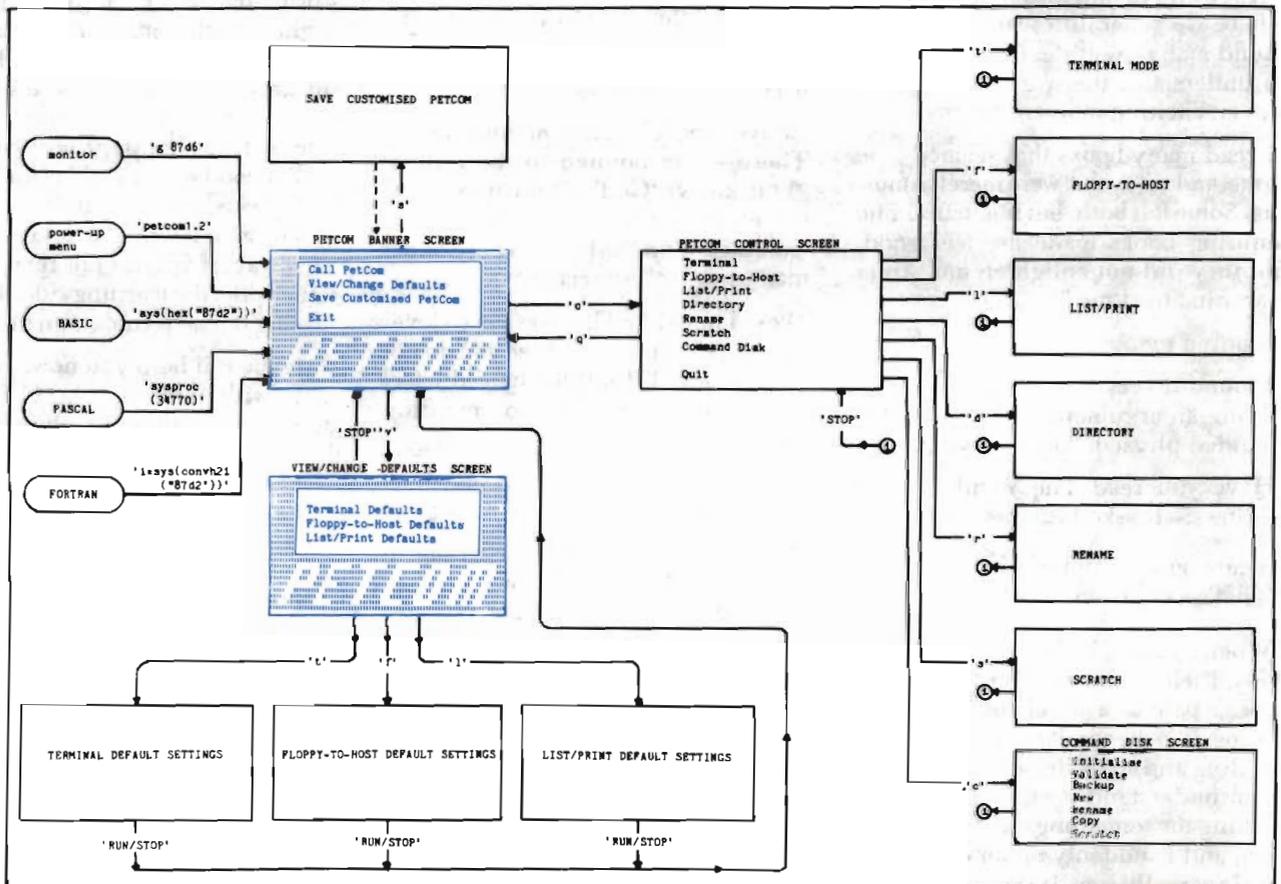
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(P)T3 — NOVEMBER 83

(1 disk/2 tapes)

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TRIAL BAL INST.W	Trial Balance instructions paperclip file.
E-P.START UP.Z	Electric Pencil Boot — word processing.
ELECT PENCIL.F	Electric Pencil Fat 40.
ELECT PENCIL.8	Electric pencil 8032 — word processor.
PENCIL-S.SCRPT.Z	Electric pencil file
S.SCRPT-PENCIL.Z	Electric Pencil file
DATA LOADER	Utility prog — produces data statements with data
MULTI-CHOICE+.P	Educ — Make up a multiple choice questionnaire.
MULTIQUIZ.P	Educ — demo of a multi-choice program.
LOAN AMORT.8	Loan amortization — calculate interest etc. on a loan.
WP LIST/SCREEN.Z	List word processor files — e.g. Trial Bal Inst.w.
ALPH.DIR.INSRT.Z	Utility prog — alphabetize disk directories.
BOWLING.4	Game — up to 4 players.
BUDGET.P	Home budget and checkbook control.
DISK DATABASE.P	Database — simple disk data entry — instructions in program.
RAMTEST4.1PG.4	Utility prog — program to test RAM.
REVIVE.Z	Utility prog — revive disk directory.
SWAP.Z	Utility prog — similar to "REVIVE.Z" program.
TAPE DATABASE.P	Database — simple tape data entry — instructions in program.

(C)T3 — NOVEMBER 83

(1 disk/tape)

LIST-ME (C)T3.L	This file contains information about the programs on (C)T3. To access it, LOAD and LIST it.
SUPERTREK.C	Guide the Enterprise around the galaxy. Object: kill all Klingons before the time runs out. The sound, the colour & the graphics are superb! (Watch out for the built-in commercials.) Rating (out of 10): 10.
CLOCK.C	Set the time in hours and minutes. Then the time will be continuously displayed on your VDT. To get rid of the click, hit RUN/STOP RESTORE. To restart enter SYS 832
RAINBOW.C	Plays "Over the Rainbow" from the classic motion picture "The Wizard of Oz". Also displays the lyrics so you can sing along. . .
DOS IN BASIC.C	Displays the disk directory. To load a program simply move the cursor beside the program name and press return.
COLUMN CALC.C	A visicalc type program written entirely in BASIC. Converted to the 64 by Steven Darnold.
COMBINAT WARS. C	Save your warp speed starship by correctly answering the multiplication questions torpedoed at you.
TYPING PRACT.C	Test you keyboard manipulation skills. Has 10 levels of difficulty. The graphic display is very helpful.

NON EXEC.Z	Tells you what lines of a pure BASIC program are unexecutable. This file is meant to be examined by "NON EXEC.Z".
SAMPLE.D	
CAVES.C	Search the caves for treasure. Write down any words that you come across. They may be magic! Beware of the goblins. Good luck.
SD FILE COPIER.C	Copy any selection of programs from one disk to another. Requires one 1541 disk drive.
ALARM CLOCK.C	Set the time in hours and minutes. Then the time will be continuously displayed on your VDT. Set the alarm but don't count on it waking you. To get rid of it hit RUN/STOP RESTORE. To restart enter SYS 832.
DISK MENU 64.C	Reads the disk directory then allows you to load any program from the disk.
SPELLING GAME.C	Test your spelling ability. If you do well enough you are rewarded with a game.
CHECKBOOK.C	Keep your checkbook balanced. If you need help, go to the 2nd menu and press "9".
BALANCE.D	A data file used by "CHECKBOOK.C" Don't attempt to load it yourself, it won't work.
TRCOUNTER.D	A data file used by "CHECKBOOK.C" Don't attempt to load it yourself, it won't work.
LONG DIVISION.C	Test your ability to do long division.
MAIL.C	Versatile mail list program. Works only with disk. Prints business and Christmas labels.
SUPERKEY.C	Gives your keyboard BASIC keywords on each letter. To get a keyword, press "f1" followed by the character. "f3" will delete a keyword. "f5" LISTS. "f7" RUNs.
GRAFIX INSTR.C	Instructions on how to use "GRAFIX RTNS.C". LOAD and RUN this before you attempt to LOAD "BOX.C", "DE-SIGN.C" or "GRAFIX RTNS.C".
GRAFIX RTNS.C	Be sure to load this as follows: LOAD "GRAFIX RTNS.C",8,1
BOX.C	Makes use of "GRAFIX RTNS.C" so be sure you have loaded it properly before attempting to RUN this program.
WEDGE-64.\$7000.C	An enhanced wedge program for the;
WEDGE-64.\$8000.C	Commodore 64. Commands supported:
WEDGE-64.\$9000.C	">ADJUST", ">AUTO", ">COLD",
WEDGE-64.\$C000.C	">COLOUR", ">DEL", ">DS",
	"HELP", ">HEX", ">HUNT",
	">LOOK", ">MEM", ">MERGE",
	">N", ">OFF", ">RENUM", ">SAVE",
	">START", ">SEND", ">\$"? & ">"/".
	The first one loads at \$7000 providing you load it as follows: LOAD "WEDGE-64.\$7000.C",8,1 To activate it enter: SYS 7*4096 The second one loads at \$8000 providing you load it as follows: LOAD "WEDGE-64.\$8000.C",8,1 To activate it enter: SYS 8*4096 The third one loads at \$9000 providing you load it as follows:

	LOAD "WEDGE-64.\$9000.C",8,1 To activate it enter: SYS 9*4096 The last one loads at \$C000 providing you load it as follows: LOAD "WEDGE-64.\$C000.C",8,1 To activate it enter: SYS 12*4096		
TOKENIZER.C	Converts a sequential file listing of a program back into an executable program.		
(V)T4 — DECEMBER 83			
(1 disk/2 tapes)			
LIST-ME (V)T4.L	List this file for description of programs on (V)T4.		
TRON.V	The object of this game is to fill your screen with your trail but don't run into the other trails or your own. Requires a joystick.		
ASTROGLAD INST.V	Use < & > to rotate your ship, ? to fire, SHIFT, CTRL and COMMODORE keys to move ship at various speeds.		
ASTROGLADIATOR.V	The object of this game is to destroy as many alien gladiators in the cosmic arena as possible.		
DISK TIDIER.Z	Collects a disk, scratches unwanted files and collects the disk again — works on all Commodore machines.		
MICROS-1 3K.V	These "Micros" programs are tutorials on the basics of the 6502 chip and a bit about Machine Language. They will auto-load the next section from disk.		
MICROS-2	See above		
MICROS-3	See above		
MICROS-4	See above		
MICROS-5	See above		
MICROS-6	See above		
LADDERS LOADER.V	This program must be RUN before the "LADDERS8K.V", then LOAD the Ladders game.		
LADDERS8K.V	The object of this game is to collect boxes to win points and climb the ladders to the top. (similar to Donkey Kong)		
MONTHS 1984 3K.V	Displays any month of a given year.		
BILLBOARD 3K.V	Prints a billboard of sorts on the VIC 20. It allows you 3 lines of 3 letters each.		
PROG CONVERTER.Z	A disk utility which allows you to convert a BASIC VIC or 64 program to run on a PET. This program will run on any Commodore machine.		
ECONOMICS 8K.V	Keeps track of your family budget as well as birthdays etc. There is an address to write to in a REM statement for full documentation.		
PACK MAN.V	Similar to the arcade game version Use @ : = / to move your man.		
MAZEMAN.V	Use joystick or keys A W D X to move your man through the maze. Eat as many dots as you can and escape without being eaten.		
PLOW BY #'S 3K.V	Educational game for young children.		
(C)T4 — DECEMBER 83			
(1 disk/tape)			
LIST-ME (C)T4.L	This file contains information about the programs on (C)T4. To access it, LOAD and LIST it.		
BLOCK MODIFIER.C	Utility — LOAD a block into memory, examine it, change it if you like and then SAVE it back to disk. WARNING: You can ruin a disk if you are not careful!		
		GALACTIC EMPIR.C	Game — Object: control more planets than any of your opponents. How?: send out fleets of ships to other star systems. Notes: Fleets move 3 units per year after 1 acceleration year in which they move only 2 units. Once a fleet has been launched they maintain radio silence and can not be recalled. Up to 10 people can play. May the force be with you. . .
		GE. ENTERPRISE.D	A data file loaded and used by "GALACTIC EMPIR.C".
		COPY SOME.C	Utility — Copy any selection of programs from one diskette to another. Requires 1 1541 disk drive. Note: Play it safe, put a write protect sticker on the original disk.
		COPY SOME ML.D	A data file loaded and used by "COPY SOME.C".
		BLACKJACK.Z	Game — Play Blackjack against your Commodore 64. Notes: If you think 1 card is all you will need to win you can double your bet. If the dealer starts with an ace showing, you can get insurance. If your first 2 cards are of equal value you can split them and play two hands.
		BIRTHDAY 2.C	Music/Sound — Plays Happy Birthday and displays the words at the same time. Then a cake is displayed. To almost blow out the candles hit "F1". To complete the job press "F3". Then "F1" gives the cake again or "F3" ends the program. To change the name to suit your party change line 2300 and line 2310.
		LOAD ADDRESS.C	Utility — Display the load address of a program from disk.
		CHRISTMAS.C	Misc — Merry Christmas from TPUG.
		SQUARE ROOT.C	Utility — Enter any positive no. and the computer will tell you its square root.
		TRIGONOMETRY.C	Utility — Find the cosine, sine, tangent, secant, cosecant or the cotangent of a number.
		DISK TIDIER.Z	Utility — Go through a disk and scratch files that are no longer of any use to you — a real time saver.
		COMMODORE LOGO.C	Misc — 8 Commodore logos of various colours are randomly displayed on your VDT.
		LEMONADE.C	Education — Try and make your fortune selling lemonade. Factors to consider include temperature, the cost of ingredients, taxes and advertising.
		CRAZY BOMBERS.C	Game — Can you handle a bomber? If you plan to play this game you better be able to. Object: Drop your bombs on the targets only. Notes: You are only allowed to miss 3 times. Beware of the death beam!
		BANKER.C	Game — This program can act as the banker for a game such as Monopoly or Payday.
		COLR SEL TUTOR.C	Education — The selection of Commodore 64 colours for border, background, and characters is discussed and illustrated.
		COLR SELECTOR.C	Misc — Experiment with the 4096 screen colour combinations of the Commodore 64.

PERSONAL ACCNT.C Business — Keep track of where you are getting money and where you are spending it.

TAXMAN.C Education — Pick a number. The taxman will take the multiples & factors of your number. The one with the highest total at the end of the game wins.

GRANDPRIX.C Game — Avoid the wall & obstacles — "A" moves left. "S" moves right.

DBASE.C Business — a disk-based data base for the 64.

SCREEN TEST.C Utility — Pick the border, background and character colours. Then see if your combination looks good.

DOS.C Utility — Do various disk operations such as format a new disk initialize a disk, copy a file, rename a file, check the error channel and more. . .

DOODLE.C Misc — Sit back and watch the 64 doodle.

ARROW+.C Game — Get as many points as you can by catching the boxes. Avoid the walls and your tail. Use the keyboard or a joystick.

EMPLOYER TAX.C Business — Computer assistance for IRS Form 941 (Employer's Quarterly Federal Tax Return).

WORD PRO 64.C Business — A tape-based word processor for the 64.

QUERK.C Game — A game similar to Pacman. "J" moves left. "K" moves right. "I" moves up. "M" moves down.

JOGGER.C Misc — If you jog 4-6 miles, this program will help you maintain a record of your running performance.

BACH INVENTN#8.C Music/Sound — Play Bach's Invention #8 in F. Suggested speed 100.

(P)T4 — DECEMBER 83

(1 disk/2 tapes)

LIST-ME (P)T4.L List-Me for (P)T4.

PENCIL BOOT.P Pencil word processor loader.

4032-PENCIL.F Pencil word processor -code for Fat 40.

8032-PENCIL.8 Pencil word processor — code for 8032.

PENCIL FORMAT.P Pencil word processor — code for printer formatting.

CONVERT PENCIL.P Pencil word processor — convert pencil files to other word processor formats.

CNVT TO PENCIL.P Pencil word processor — convert other word processor files to pencil format.

QUIC-REF.W Pencil word processor — short file of instructions.

REF-GUIDE.W Pencil word processor — full file of instructions.

BRAILLE.Z Educational — produce braille characters (printer).

CALENDAR YYYY.Z Utility — Print a calendar for any year.

DATE.D File used in "CALENDAR YYYY.Z".

DIR/LIST.P Utility — List programs directly from disk.

NIGHT DRIVE.P Game — Race car — don't crash!!

THE VALLEY.Z Game — Dungeon & Dragons with graphics (J&K Lee). See "J&K LEE INST.D".

PHONE BOOK.Z Utility — Phone directory (J&K Lee). See "J&K LEE INST. D".

MULIT-REC II.Z Buss — Filing system (J&K Lee). See "J&K LEE INST.D".

J&K LEE INST.D Instructions for Valley, Phone Book, and Mulit-Rec II.

TAPE — DISK V4.Z Utility — copy tapes to disk.

(C)U1 — UTILITIES

(1 disk/tape)

LIST-ME (C) U1.L This file contains information about the programs on (C)U1. To access it, LOAD and LIST it.

1541 BACKUP.C Copy the entire contents of one disk to another using your 1541 disk drive. For instructions see page 44 of the Nov/Dec 1983 TORPET.

64 MEM CHART.C A chart of the Commodore 64's memory layout.

64 RENUMBER.C A simple renumbering routine. It doesn't change a GOTO or GOSUB so you'll have to change them manually. To set ranges use REM statements at the beginning of each routine using this format: 10 REM*10*.

BASE.C Converts numbers from one base to another. For example: FF base 16 is 255 base 10.

C-64 WEDGE.C Loader programs for "DOS 5.1".

C64 PET SCREEN.C This routine will reconfigure the video chip so the screen starts at \$8000 (like the PET), so PET programs that don't normally work, due to POKEs and/or PEEKs to the screen, should work.

C64 TINY-AID.C Adds functions such as search and replace, renumber, delete line ranges, kill a program in memory, append programs and more. . .

CHECK DISK.C Checks a disk that you have just formatted to ensure that all the blocks on the disk are good. If bad blocks are found, the program tells the BAM not to use them.

COLOUR BAR 2.C Displays square of each colour available on the 64 on the screen and then cycles through the background and border colours.

COLOUR COMBO.C Displays every possible combination of screen and character colours so you can see which ones are readable.

COPY FILE.C Copy any one file from 1 disk to another using your 1541 disk drive

COPY FILES.C Copy as much or as little of the contents of one disk to another using your 1541 disk drive.

COPY-ALL.C Copy programs from one 1541 to another 1541. Needs 2 1541 disk drives — 1 should be changed to device #9 using "DISK ADD CHNGE.C"

DEC DUMP.C Performs a decimal dump on any program that you specify from disk

DEMO JOYSTICK.C Test the mechanism of your joystick to be sure that it is in working order.

DIALER.C Hold the phone in front of your VDT speaker, choose a number and the 64 will dial the number for you. Note: If your exchange does not support touch tone dialing, this program will not work.

DIR.C Allows you to look at the directory, send disk commands and examine the disk status.

DISK ADD CHNGE.C Change the device number of your disk drive. For more detailed information see "HOW TO USE.C".

DISK LOG.C	Displays the file name. If the file is a program it tells the start and finish address. If it is a sequential file it tells you how many bytes long it is. Output can be directed to the screen or a printer.	PET EMU BOOT.C	Boots "EMULATOR" which reconfigures your 64 to run most BASIC PET programs.
DISKVIEW 2.C	A very useful program that lets you do things such as trace blocks, unscratch a file, look at the Block Availability Map and much more.	PET EMULATOR.C	Reconfigures your 64 to run most BASIC PET programs.
DISPLAY T&S.C	Allows a programmer to examine the contents of a block by specifying the particular track number and sector number which identifies that block.	PETLOAD PRGM.P	Load programs saved on a Commodore 64 into a PET/CBM with BASIC 4.0.
DISSASSEMBLER.C	Disassembles any section of the Commodore 64's memory to your printer or your VDT.	PRINTER TEST.C	Prints a listing of the characters in a format that allows easy checking of the mechanical and electronic capabilities of the printer.
DOS 5.1	Loaded by "C-64 WEDGE.C". Don't load it yourself, it won't work.	PROG CONVERT.C	Converts a Commodore 64 or VIC 20 program so it will LOAD into a PET. Useful for people with a 64 at home and PETs at school.
DUMP .C	Performs a decimal dump on any program you specify from disk.	PRG FUNCTION.C	Allows you to assign words and/or values to each function key. They will remain until you power down or press RUN/STOP RESTORE.
EMULATOR	Reconfigures your 64 to run most BASIC PET programs. Loaded by "PET EMU BOOT.C".	RANDOM FILE.C	To find out how to manipulate random files list and explore this program.
FORMAT.C	A useful little program that rounds numbers to 3 decimal places and lines up the decimal point.	RND COLR BARS.C	Produces random colour bars on your VDT.
HOW PART TWO	Gives instructions for: "PERFORM TEST.C", "SEQ FILE.C" and "RANDOM FILE.C".	SCREEN.C	Test your joystick to be sure that everything inside is OK.
HOW TO USE.C	Gives instructions for: "C-64 WEDGE.C", "COPY-ALL.C", "DISK ADD CHNGE.C", "PRINTER TEST.C", "VIEW BAM.C", "DISPLAY T&S.C", and "CHECK DISK.C"	SEQ FILE.C	To find out how to manipulate sequential files, LIST and explore this program.
INTERMOD.C	Calculates intermodulation products for all combinations of frequencies you input.	SPARKLE.C	If you are bothered by screen "noise" during GET and INPUT statements, this program should eliminate it.
J/20 MORSE R/T.C	Transmit morse code using your Commodore 64.	SUPERMON INST.C	Instructions for "SUPERMON V2.C". LOAD and RUN this before you attempt to use "SUPERMON V2.C".
JOY 2.C	Test your joystick to be sure that everything inside is OK.	SUPERMON V2.C	A Machine Language monitor, lets you assemble Machine Language by hand.
LISTER.C	LIST a program from your disk to your printer or your VDT.	TIMER.C	Measure the amount of time spent by a radio or television station on news, sports, ads or whatever.
LISTER 2.C	LIST a program from your disk to your printer or your VDT.	VICLIST.C	LIST a program from disk to printer.
LOCKDISK 64	Protects your programs. Autoruns programs and won't let you break out.	VIEW BAM.C	Allows a programmer to examine the contents of the sectors which make up the block availability map or BAM. For more information see "HOW TO USE.C".
LOTTERY DRAWER.C	Selects and displays random nos. between the limits you specify. (up to 5 digits)	WEDGE-64-\$9000.C	An enhanced wedge program for the Commodore 64. Commands supported:
MENU.C	Loads the directory of a disk then lets you pick the program you want by number. After you choose the program it is automatically loaded and run.	WEDGE-64-\$C000.C	">ADJUST", ">AUTO", ">COLD",
MOVING SIGN.C	Input a message and then watch it displayed in big characters across your VDT.	WEDGE-64-\$7000.C	">COLOUR", "DEL", ">DS", ">HELP",
PCB PRINTER.C	Prints programmable character grids so you can design your own character sets on paper.	WEDGE-64-\$8000.C	">HEX", ">HUNT", ">LOOK", ".MEM",
PERFORM TEST.C	Allows anyone to test the electronic and mechanical capabilities of the 1541 disk drive.		">MERGE", ">N", ">OFF", ">RENUM",
PET EM.C	A limited PET emulator program. Moves the screen so that PET programs with screen POKEs will work.		">SAVE", ">START", ">SEND", ">\$",
			AND ">/. The 1st one loads at \$9000 providing you LOAD it as follows: "WEDGE-64-\$9000.C",8,1 To activate it enter: SYS 9*4096 The 2nd one loads at \$C000 providing you LOAD it as follows: "WEDGE-64-\$C000.C",8,1 To activate it enter: SYS 12*4096 The 3rd one loads at \$7000 providing you LOAD it as follows: "WEDGE-64-\$7000.C,8,1 To activate it enter: SYS 7*4096 The 4th one loads at \$8000 providing you LOAD it as follows: "WEDGE-64-\$8000.C",8,1 To activate it enter: SYS 8*4096

(C)T5

By David Bradley
C-64 Librarian

LIST-ME (C)T5.L

Load as follows: LOAD "LIST-ME (C)T5.L",8

This file contains 1 line documentation of the programs on (C)T5 (TPUG January Commodore 64 release). To access the information LOAD and LIST this program.

AUTOTERM/1650.C

Load as follows: LOAD "AUTOTERM/1650.C",8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$2385

Finish address (Decimal): 9093

Block length: 28

A version of Steve Punter's terminal program. This version takes advantage of the 1650 AUTOMODEM's autodialling capabilities.

The menu of the program looks like this:

- 1 - Terminal Mode
- 2 - Receive program
- 3 - Transmit program (Beware!)
- 4 - Print Disk File
- 5 - Change Colour
- 6 - Dial a BBS
- 7 - Create #'s File
- 8 - Quit

1 puts you into terminal mode.

2 is for downloading programs to disk from Bulletin Board Systems written by Steve Punter. When you are connected to one of these systems to see what programs are available for downloading type LIST when you are in Command > mode. Then the BBS should show you what programs are available for you to download. (If a program has a '*' beside it that means that whoever uploaded it did not intend it to be available to the public. The only way to get it would be to ask the person that uploaded it for the security code that they put on it.)

Suppose you saw a program called TPUG and you wanted to download it. You would type in LOAD. The BBS would ask for the name of the program that you wanted. So you type in TPUG. As long TPUG is a valid program name the BBS should now tell you approximately how long it will take to download the program that you have chosen and that it is waiting for the start signal.

So you press CLR/HOME to return to the menu and then hit '2'. Your terminal will ask you what you want to call the program on your disk. After you tell it the name your terminal tells the BBS that you are ready and the BBS responds by starting to send the program.

If everything is going ok you should see a '-' everytime a block is received without errors.

If you see a ':' then a bad block has been sent but don't worry as the terminal program will ask the BBS to send it again.

When the program has been transmitted you will be returned to terminal mode and you can continue with the BBS.

3 is for uploading programs from disk to Bulletin Board Systems written by Steve Punter. One thing about this section - for some unknown reason it will not always work reliably on the C-64. So if you upload a program you should download it right away and try running it to see if it reached the BBS ok.

Using this section the same as the downloading section except that you tell the BBS that you want to SAVE a program. Also you have to decide whether you want to put a security code on the program (so that only people that you tell the code can download the program) and what the deletion code is.

4 can be used to print sequential files from disk. All you have to do is press '4' and tell the terminal program what the name of the file that you want to print is. The program will check to see if the file is on your disk, then it will ask you if you want CBM or ASCII output (depending on what type of printer you have) and then print it on your printer.

5 will allow you to change the colours of the border (f1), background (f3) and cursor (f5). When you get a combination that you want press 'f7' to return to the menu.

6 is the section of the program that allows you to take advantage of the autodialling feature on the 1650. After you press '6' you will be asked if you want to get the number from the keyboard or the disk. If you pick K the program will ask you for the number to dial. If you pick D the program will ask you for the file name of your numbers file. After you input the file name you will be asked if you want to clear the used numbers file. This file keeps track of which systems from your list you have already made contact with so it won't redial them. If you press 'Y' the file will be cleared and then your numbers file will be read into memory. If you press 'N' your numbers file will be read in and the used numbers file will remain as it was. Either way the program will display all of the numbers from your list and ask you what you want to dial. If you want to dial all of the numbers enter 'A' and the program will cycle through the list over and over until it gets through to a system or you tell it to stop. If you only want to dial one of the numbers just enter the number to the left of the phone number and the program will dial just that number until you tell it to stop or it gets through. If you decide to stop the program just hit a key and you will be returned to the menu. Once you get through to a system the program will ring a bell. To enter terminal mode press any key.

7 will allow you to create a file of BBS numbers. If you pick this option the program will ask to enter what you want to call your file. After you do that type in the numbers when you are prompted to do so. When you are finished just press return and the file will be written to your disk and you will be returned to the menu.

8 will let you leave the program.

This program was originally written by Steve Punter. It was converted to the C-64 by Keith Peterson. The colour was added by Gord Duesburry and the autodialing by Richard Bradley.

One more thing, if you want the program to wait a bit longer to see if it gets a carrier (suppose you were dialing long distance) put a '#' after the number that you want to dial. Each '#' will make the program wait an extra 5 seconds.

TERM.64.D

Do NOT attempt to LOAD this program.

Start address (Hexadecimal): \$5900
Finish address (Hexadecimal): \$5f48

Start address (Decimal): 22784
Finish address (Decimal): 24392

Block length: 7

A machine language program loaded and used by 'AUTOTERM/1650.C'.

WET PAINT.C:

Load as follows: LOAD "WET PAINT.C" ,8

Start address (Hexadecimal): \$0801
Finish address (Hexadecimal): \$19D3

Start address (Decimal): 2049
Finish address (Decimal): 6611

Block length: 18

In this game you will be paid 1 cent per inch that you paint. Other painters are working as well. You must avoid the areas of the wall that they have painted already or your brush will blow up.

Eventually the assistants will corner themselves and they will blow up leaving you more room to manoeuvre. At first there is one assistant. If you outlast him the boss will hire 2 more. If you survive these two then the boss will hire 3 more. It gets tight sometimes but that is what makes this game fun.

Use joystick port #1 to control your brush.

VIPER.C

Load as follows: LOAD "VIPER.C" ,8

Start address (Hexadecimal): \$0801
Finish address (Hexadecimal): \$1C00

Start address (Decimal): 2049
Finish address (Decimal): 7168

Block length: 21

In this game you must get the '*'s but avoid everything else. Use joystick port #1 to move, select level and pick what maze (if any) you want to use. You get twice as many points if you pick an easy maze and 5 times as many points if you pick a hard one. Good luck...

LIST FREEZER.C

Load as follows: LOAD "LIST FREEZER.C" ,8

Start address (Hexadecimal): \$0801
Finish address (Hexadecimal): \$0AE1

Start address (Decimal): 2049
Finish address (Decimal): 2785

Block length: 3

This little utility will let you completely stop or pause a program listing on the screen just by holding any one of the 'SHIFT' keys. 'SHIFT LOCK' will freeze the listing until you release it. A handy little program...

RASTER INTERPT.C

Load as follows: LOAD "RASTER INTERPT.C" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$13C0

Finish address (Decimal): 5056

Block length: 12

This program will demonstrate how you can use the raster interrupt to display 2 different background colours on your monitor at the same time. 'f1' controls the top colour, 'f3' controls the bottom colour, 'f6' stops the program, 'f7' changes the foreground colour, cursor up moves the split up and cursor down moves the split down.

SIN DISK COPY.C

Load as follows: LOAD "SIN DISK COPY.C" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$13FC

Finish address (Decimal): 5116

Block length: 13

This very useful utility program will allow you to copy any selection of programs from 1 disk to another. The first thing you have to do is insert the source disk and press return. Now the program will display the names of the programs on the disk and you choose which ones you want to copy simply by typing 'Y' if you want to copy it and 'N' if you don't.

If you have found all of the programs that you want to copy and want to start copying before you reach the end of the directory press '*'. Now the programs that you choose to copy will be loaded into the memory of the 64. When this is complete the program will tell you to insert the destination disk and press return. After you do this the programs will be copied to the destination disk.

JSTICK DOODLE.C

Load as follows: LOAD "JSTICK DOODLE.C" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$1048

Finish address (Decimal): 4168

Block length: 9

Use a joystick in port #2 to draw lines on the hi-res screen. To 'lift' the pen hold down the fire button. To clear the screen press 'f1'. 'f3' changes the border colour. 'f5' changes the background colour. 'f7' changes the colour of the lines that you have drawn.

MILEAGE.Z

Load as follows: LOAD "MILEAGE.Z" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$0A2A

Finish address (Decimal): 2602

Block length: 3

After you input the distance, the quantity of gas and the cost, your Commodore 64 will tell you how many miles per gallon you are getting. If you input metric figures the program will convert them for you free of charge.

LIFESCORE.Z

Load as follows: LOAD "LIFESCORE.Z" ,8

Start address (Hexadecimal): \$0401

Start address (Decimal): 1025

Finish address (Hexadecimal): \$37F7

Finish address (Decimal): 14327

Block length: 53

Your lifestyle today has more to do with your tomorrows than anything else. This program is designed for adults who presently do not have chronic diseases. After you complete the questions you will be shown your estimated life expectancy. NOTE: some of the questions are very personal so it is best to do this test when you are alone with your computer.

RANDOM LOTTO.C

Load as follows: LOAD "RANDOM LOTTO.C" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$18C2

Finish address (Decimal): 6338

Block length: 17

This program generates random numbers for the Lotto 6/49 and Lottario lotteries. In both cases several series of numbers each are generated in succession. Duplicate numbers within a series are rejected as the rules of the lotteries do not allow them. 'f1' picks Lotto 6/49 numbers. 'f3' picks Lottario numbers.

MUNCHMATH.C

Load as follows: LOAD "MUNCHMAN",8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$18E5

Finish address (Decimal): 6373

Block length: 18

This is an educational game in which you are tested in addition, subtraction, division and multiplication. Once you have decided what you are to be tested in you can pick what level you want to be tested on. Level 1 is the easiest and level 9 is the hardest.

If you get the question right you advance one more dot towards the power pill and you remain the same distance from the ghost. However if you miss a question the ghost moves and you don't. Out of 15 questions you are only allowed 3 errors. If the ghost catches you, you are moved down a level and you start over.

WORD WORKER.C

Load as follows: LOAD "WORD WORKER.C",8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$2906

Finish address (Decimal): 10502

Block length: 34

This word processor features auto append, global change, line move and replace, display catalog, load and save and much, much more.

Once you have loaded the program and keyed in RUN, you will see the main menu appear on the screen. To create a document press 'C'. You are now in NEW mode, and can begin typing your text. Do not press RETURN unless you want to cause a carriage return when your text is printed. To use special printer functions, just press the function key corresponding to the action you want taken (see function menu). For example, to underline one word, press 'f5'. You will see an upward arrow appear. This means a function has been turned on. Now type the word. Next press 'f6'. A left pointing arrow now appears. This means a function has been turned off.

To use the auto append feature, type in some text and then get some more from disk or tape by pressing G for GET. It will now prompt you for file name, disk or tape and clear memory yes or no. To append press n. The new file will stack behind the existing one in memory. You may do this with 2 or more files. Just keep loading them without clearing the memory.

The edit mode has 5 options: Move a line, Replace a line, Global change, forward and backward search. The two search options display the contents of the variables (a\$(x)) with number x appearing to the left. To replace a line, press 'f3' and refer to the number x when asked for line number. The old line will be displayed on the screen. Key in the new line (up to 79 characters) and press return if a carriage return is desired, 'f1' if not. To move a line press 'f2' The system will prompt you for line number, then, 'plus another', then line to be replaced. The plus another allows you to add two lines together and move them some place else. If you only want the one line moved, just hit RETURN when asked for another. The Global change option, 'f8', asks you for the word you want changed, then for the correction. It will search for each occurrence of the word to change, stop and ask you if you want to change that one or not.

If you have any questions about or improvements to this program the author would like to hear from you.

Write to:
Jim Garrick
811 N. Prospect
Kent WA.
98031

64 FAST POKES.C

Load as follows: LOAD "64 FAST POKES.C",8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$1055

Finish address (Decimal): 4181

Block length: 9

This program is designed to show how to quickly poke a one colour display on the screen of a Commodore 64 without tiresome poking in each location with colour. And it is faster than poking the whole screen with colour. If you have educational disks (K disks) that don't work, you might try adding this routine to them and see if it doesn't correct the problem. See REMarks in the program for documentation.

4040 COMMANDS.C

Load as follows: LOAD "4040 COMMANDS.C",8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$1A08	Finish address (Decimal): 6664

Block length: 19

If you have an IEEE interface (such as a BusCard, or a C-Link) on your Commodore 64 and you are connected to a dual drive this program will allow you to duplicate a disk (f1), copy a file from d0 to d1 (f2), initialize a drive (f3), validate a disk (f4), get the disk directory (f5), format the disk in drive 1 (f6), determine what (if any) disk error has occurred (f7) and rename files (f8).

THE GREAT FRED.C

Load as follows: LOAD "THE GREAT FRED.C",8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$17D6	Finish address (Decimal): 6102

Block length: 16

First Fred asks for your name and informs you that he is going to read your mind. Then you are asked to pick a number between 1 and 10. Fred instructs you to do various mathematical functions to your number until he eventually tells you the number you now have. He is NEVER wrong . . . or so he says. Have fun. . .

LIST-ME VIC 2.L

Load as follows: LOAD "LIST-ME VIC 2.L",8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$1B52	Finish address (Decimal): 6994

Block length: 20

This is not a program as such, so don't run it. This is a LIST-ME file that will give you information on the Commodore 64's video chip. To access the information LOAD and LIST this file. If you have a printer it would probably be a good idea to LIST this file to it.

DEFINITION.C

Load as follows: LOAD "DEFINITION.C",8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$6005	Finish address (Decimal): 24581

Block length: 89

This game is based on the TV show 'DEFINITION'. It is played the same way. You are given a clue and then you must give away a letter that you don't think is in the definition and take a letter that you think is in the definition. If you give away a letter that is in the definition your opponent gets a free guess and you lose your turn. You have 10 seconds to give and take letters and 45 seconds to guess the word or phrase. Each correct answer is worth 50 points and a chance to play for bonus points. The game contains 304 different definitions so you should be able to play this game for quite a while before you run out of new ones. More instructions are given in the program. Have fun. . .

TEXTMASTER.C

Load as follows: LOAD "TEXTMASTER.C",8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$19B3	Finish address (Decimal): 6579

Block length: 18

Textmaster.c is a word processor designed to be used by small children in a classroom environment. But don't let that turn you off, it is still a very good simple word processor that can help you get more out of your Commodore 64. I could say much more about this program but since the next 3 files contain information about it, I won't. After you load in TEXTMASTER.C press 'f1' and then 'L'. The directory will appear on the screen. Load TM-INSTRUCT 1, 2 and 3 and print them out for all the documentation you could ever need about this program.

TM-INSTRUCT 1.D

Do not attempt to LOAD this file.

Start address (Hexadecimal): \$2000	Start address (Decimal): 8192
Finish address (Hexadecimal): \$4760	Finish address (Decimal): 18272

Block length: 40

This file contains information on how to use TEXTMASTER.C. To access it load TEXTMASTER.C, then load this file and print it. . .

TM-INSTRUCT 2.D

Do not attempt to LOAD this file.

Start address (Hexadecimal): \$2000	Start address (Decimal): 8192
Finish address (Hexadecimal): \$4760	Finish address (Decimal): 18272

Block length: 40

This file contains information on how to use TEXTMASTER.C. To access it load TEXTMASTER.C, then load this file and print it. . .

TM-INSTRUCT 3.D

Do not attempt to LOAD this file.

Start address (Hexadecimal): \$2000	Start address (Decimal): 8192
Finish address (Hexadecimal): \$2871	Finish address (Decimal): 10353

Block length: 9

This file contains information on how to use TEXTMASTER.C. To access it load TEXTMASTER.C, then load this file and print it. . .

USING 64 WEDGE.C

Load as follows: LOAD "USING 64 WEDGE.C" ,8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$2F5E	Finish address (Decimal): 12126

Block length: 40

This program will tell you how to take advantage of all of the features of C-64 WEDGE.C and DOS 5.1

C-64 WEDGE.C

Load as follows: LOAD "C-64 WEDGE.C" ,8

Start address (Hexadecimal): \$0401	Start address (Decimal): 1025
Finish address (Hexadecimal): \$043E	Finish address (Decimal): 1086

Block length: 1

This program 'boots' "DOS 5.1".

DOS 5.1

Do NOT attempt to LOAD this program.

Start address (Hexadecimal): \$CC00	Start address (Decimal): 52224
Finish address (Hexadecimal): \$CF5A	Finish address (Decimal): 53082

Block length: 4

This utility program will allow you to do various disk functions such as get the directory, load a program and more. . .

FLAG BOOT.C

Load as follows: LOAD "FLAG BOOT.C" ,8

Start address (Hexadecimal): \$0801	Start address (Decimal): 2049
Finish address (Hexadecimal): \$09AA	Finish address (Decimal): 2474

Block length: 1

This program 'boots' "WORLD FLAGS.D" and "SYS 40784.D"

WORLD FLAGS.D

Do NOT attempt to LOAD this file.

Start address (Hexadecimal): \$2000	Start address (Decimal): 8192
Finish address (Hexadecimal): \$4810	Finish address (Decimal): 18448

Block length: 41

This file is a picture from one of the demo programs donated to the club library by Commodore Canada. The pictures were originally written for the World of Commodore show that was held in Toronto and they look very good!

BOOT 25TH.C

Load as follows: LOAD "BOOT 25TH.C" ,8

Start address (Hexadecimal): \$0801

Start address (Decimal): 2049

Finish address (Hexadecimal): \$09A3

Finish address (Decimal): 2467

Block length: 1

This program 'boots' "25TH.D" and "SYS 40784.D"

25TH.D

Do NOT attempt to LOAD this file.

Start address (Hexadecimal): \$2000

Start address (Decimal): 8192

Finish address (Hexadecimal): \$4810

Finish address (Decimal): 18448

Block length: 41

This file is a picture from one of the demo programs donated to the club library by Commodore Canada. The pictures were originally written for the World of Commodore show that was held in Toronto and they look very good!

SYS 40784.D

Do NOT attempt to LOAD this file.

Start address (Hexadecimal): \$9F50

Start address (Decimal): 40784

Finish address (Hexadecimal): \$9F90

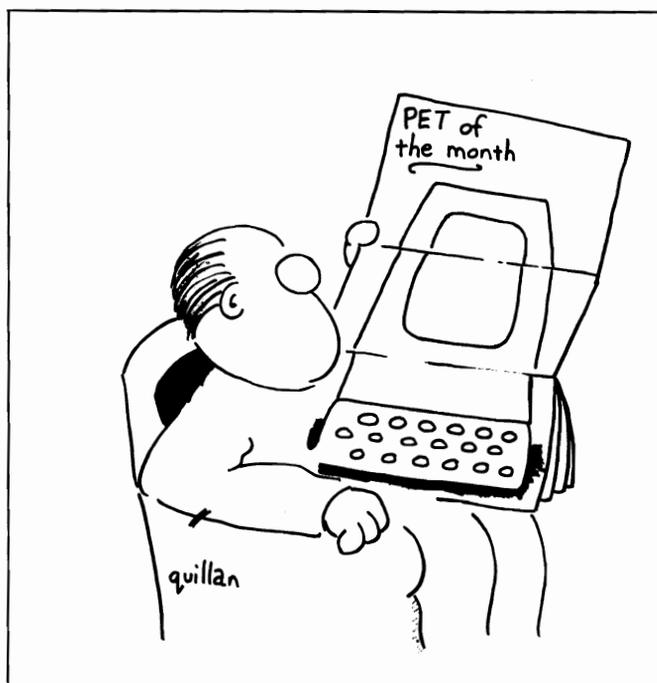
Finish address (Decimal): 40848

Block length: 1

This file is a small machine language program used and loaded by "FLAG BOOT.C" and "BOOT 25TH.C".

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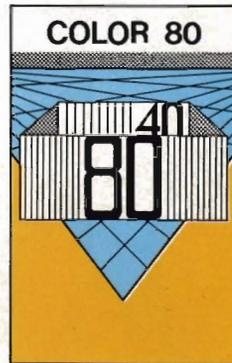
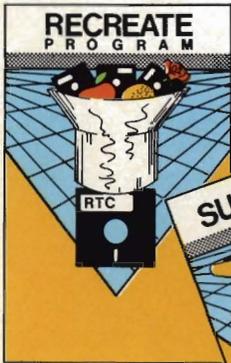
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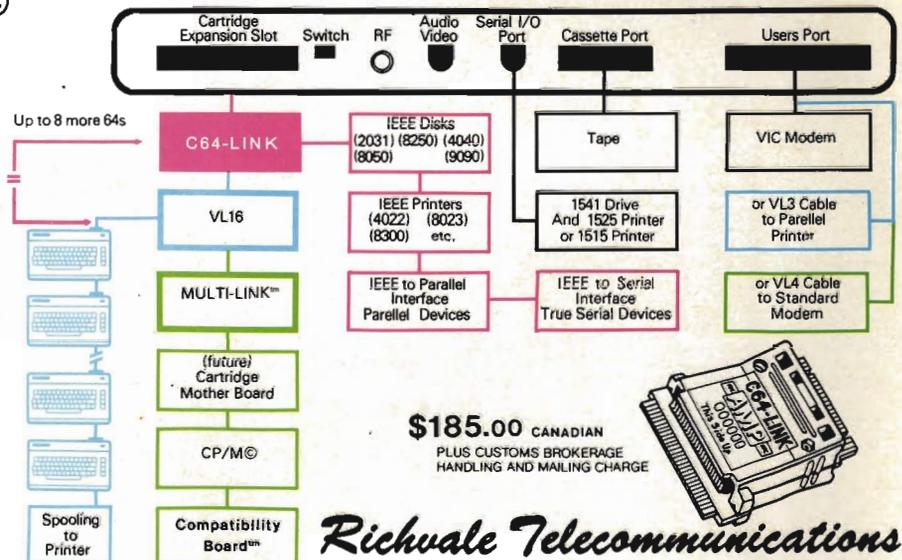


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