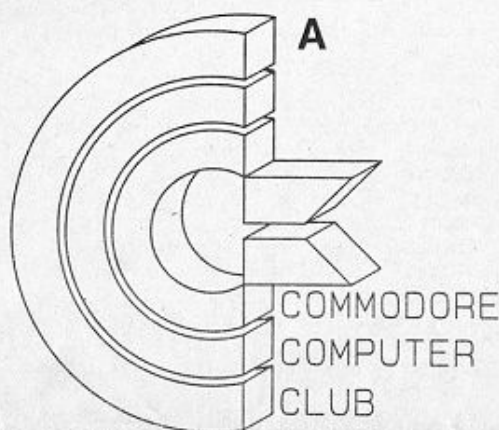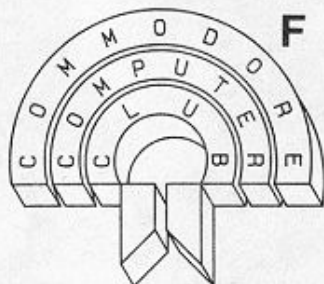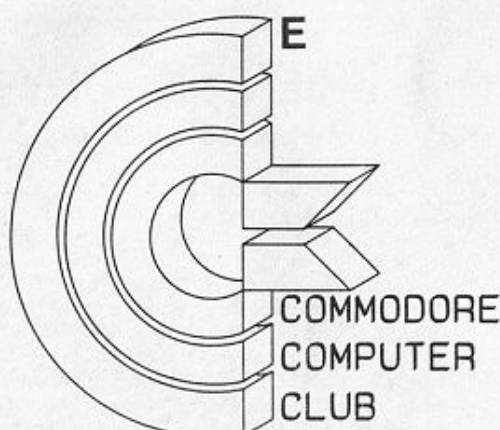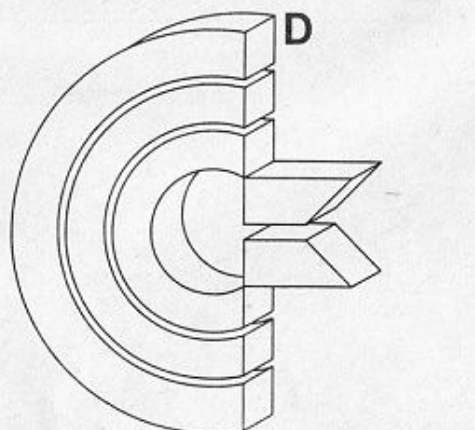# COMMODORE COMPUTER CLUB NEWS

# CHOOSE YOUR LOGO

In the beginning, there was darkness. And so it came to pass that The Vancouver PET Users' Group was born. And the light pierced through the darkness. As eons of computertime passed, the clouds began to be vanquished. But not all the clouds would go, for Mighty Victoria did not permit us our name. And so a great convocation was called in the revered halls of Sunset

But the Club still had need. A Glorious Symbol to unite us throughout the land. And so the Artists and Computer Magicians in the Club were asked to produce designs which would be worthy of becoming the Great Club Logo. Their designs were duly submitted after much creative toil and hardship. Through the alchemy of the printing press they are

Memorial Centre. From among the multitudinous murmurs and chants, there emerged ONE: The Commodore Computer Club. And the light shone full strength upon us, for Victoria was pleased. reconstructed for you here. At the next General Convocation there will be great debates and you will choose the worthy GREAT CLUB LOGO.



A — COMMODORE COMPUTER CLUB



B



C



D — COMMODORE COMPUTER CLUB



E — COMMODORE COMPUTER CLUB



F

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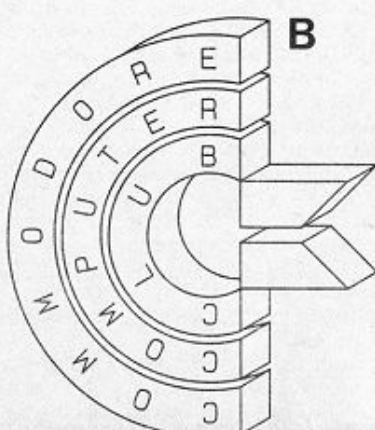
*Well, we finally did it!*

*After several months of inactivity, the Commodore Computer Club News is a reality. We've assembled what hopefully are some interesting articles and tips and hope you enjoy them.*

*Don't let your interest cease with reading this paper, however. We are looking for good articles, programs, reviews and just about anything else dealing with our favorite subject -- Commodore computers and related soft or hardware. If you've recently gotten a printer and are word processing furiously,*

*now is your chance to give your system a thorough workout with a contribution to the News.*

*People connected with this paper will be present at both the regular and workshop meetings, so please approach them with your ideas and suggestions. Otherwise, don't complain about the same old names writing the same old lines over and over in issues to come. (Yes, we plan to publish MUCH more regularly than before...).*

*But for the meantime, read ....and enjoy!*

# PRESIDENT'S MESSAGE

NIELS
HANSEN-TRIP

Over the past few years, the Vancouver Pet Users' Group has undergone many changes and has faced many challenges. We have experimented with various ways and means of getting things done and the experience gained has been hard won by our failures and our resounding successes. It's been a long time coming, but we're finally incorporated as the "Commodore Computer Club". The maturity we have gained will help to carry us through the tests that inevitably are yet to come.

The "Commodore Computer Club" -- sounds good, but what does it mean? Does it mean that we are an extension or marketing arm of Commodore Canada? Certainly not! We are an independent organization with no commercial affiliation with Commodore, although we have developed a good working relationship with them. The good reputation the club has developed has made it possible for Commodore to approve very quickly almost any request we have made of them. Therefore, because they trust the rational approach the club has used, we are permitted to bear their name. Certainly, if we damage this relationship they will consider withdrawing the privilege. The relationship is worth protecting.

Well, even if we are not a sales agency for Commodore, one of our primary goals should be the acquisition of cheap hardware and free software for the members. Wrong again! This is not one of our purposes. In fact, it is probably illegal for the club to engage in this kind of activity under our present corporate status. Good deals are a side benefit -- tinsel and glitter. Where a dealership can identify a group of people with a special interest, it is to the benefit of the company to increase the volume of their sales by offering a discount to the members of the group. The club itself cannot come between them as a middleman or it becomes simply a sales organization -- a company in itself. The executive of your club are duty bound to prevent this from happening. We are often approached by non-members who do not want to join the group, but who want a deal on a monitor or a printer. Therefore that is obviously not the purpose of the club else they would consider joining. Our answer to them is simple -- Forget it!

So what's left? Is the club a vehicle for a computerized megalomaniac to realize his ambition for control of others? Hopefully this will not be permitted to happen. There are those who would try to take advantage of this situation, but, again, it is the duty of your directors to work together

and prevent the group from being dominated by any single personality. Part of the benefit of incorporation is the official set of rules and by-laws which give the club a legal way of solving disputes. Your resources are protected to serve you better. The President must supervise the Directors in the execution of their duties and must respond to flagrant violations of the principles. However, the President does not act independently. The Directors, as a group, provide what their name implies -- they provide direction. Pay attention to your directors, get to know them all. Talk to them and tell them who you are and what you are thinking! Let them work for you. Don't give any individual the power to control you or manipulate you, or seek advantage over you. The Directors will not harm you, they are elected to their post to care for the needs of the majority and not to protect the special interests of any individual or splinter group. To accomplish this, they need information and possibly a little help.

There's not much left, is there? Out of all the things that have been said, we have not touched the purpose of the group. I have only one more thing to say. The club is a co-operative association of

computer users and enthusiasts who come together to help one another learn more about computers; to share ideas, and problems; to help one another get the best out of their equipment -- Computer Friends, you might say. The authorized dealerships, the producers of commercial software, independent company representatives, business professionals, teachers, students, housewives and just plain old hackers all joined together to help one another. Would you steal from your friends? Would you abuse them, or use them for your personal gain? Somehow, I doubt it.

We have always dreamed about the club membership explosion that would push out the walls of the Sunset Community Centre. It has ceased to be a dream and we are into that stage of rapid growth that will undoubtedly cause major changes in the texture of the group. It is an exciting time and the future is magnificent. Some of the lessons that we have learned that will help us through some tough issues are:

1. Good financial records and budget that we stick to unless there is some significant change identified.

2. Complete control of the membership list. It must be accurate and up to date.

3. Projects carefully planned

# A BRIEF HISTORY OF VPUG BY ROBERT DEBOER

The Vancouver Pet Users' Group (VPUG) was the brainchild of Richard Leon. He initiated the first monthly meetings at Riley Park Community Centre. Niels Hansen-Trip and Bror Jackson, current executives of The Commodore Computer Club, began their long term service to the group soon after it was born. That was 1977; the group met continuously except for the summer of '81 when the Vancouver Civic Strike closed meeting facilities.

The first PET users bought their machines with only a small brochure from Commodore to guide their use. Thus the group began meeting even before the PET manual was available and users relied heavily on each other for information. Naturally, the group's members had various learning levels and far-flung directions of interest, but through meeting together and preparing demonstrations they were very productive together.

Bringing equipment to meetings was a hallmark of VPUG. So even if members had "Personal Electronic Transactors", they were not totally withdrawn, secluded or privately directed with their "personal" machines.

In fact, since 1979 the group has partaken in public demonstrations at least once a year. As part of the Hobby Show at the Pacific National Exhibition, VPUG had a booth near a moon rock display. Even though this booth was under stairs, subject to a sprinkling of dust, VPUG drew such a crowd that it was given the moon rock's prominent location in 1980. That year was also the beginning of the Pacific Coast Computer Fair, an annual cooperative undertaking with other microcomputer groups. The outstanding turnout at the University of British Columbia for this Fair led to the procurement of the downtown Robson Square Media Centre for the Fair in 1981, 1982 and this year.

Though often derided as a mere toy, microcomputers have shown themselves to be a unique home tool. Implanting the machine on the domestic scene in an elevated position requires some understanding of programming, so VPUG offered courses: Harold Brochman taught machine language courses beginning in October 1982 and April 1983;

# ITEMS OF CONSUMING INTEREST ....

BY MR. MIKE

The recent drop in price of the Commodore-64 to less than $200.00 U.S. has some disturbing implications. What is the point of buying a VIC-20, even at a low price of $88.00 U.S., when it will cost at least $129 more (i.e., a total value of over $200), to bring it up to its maximum memory of 32K? Is this an attempt to kill off the VIC? Or will the VIC drop even further in price? (The Timex/Sinclair 1000 is now under $30 in some major U.S.centres.)

One rumour going around is that VIC will be obsolete in a year or so. I personally find this hard to believe, with well over a million VICs sold.

***

Speaking of low prices, if you bought a Gemini-10 printer through either the club's bulk purchase recently, or through one of the other special deals from local computer outlets which dropped the price of this unit to as low as $399, you might be having some trouble with one of the dipswitches on the back, specifically dipswitch number one.

It's supposed to turn the paper detection switch on or off, but on quite a few of the models purchased recently (and some not so recently) it doesn't work. One solution to this problem is to construct a device out of plastic film which depresses the switch, located on the left side where the paper is fed into the printer and folds around and down the back of the printer, in order to avoid being drawn into the printer with the paper itself.

Personally, I didn't like the switch either on or off, for it detects "paper out" at a point almost 3 inches from the bottom of the sheet, making writing a letter somewhat difficult (not to mention addressing an envelope).

***

If you're the owner of a Gemini, something else you may have discovered -- tractor-fed paper (with the holes punched down the right and left margins) isn't cheap. This stuff is sold by several stores, and there is an amazing inconsistency to the number of sheets per box, not to mention the price. A good price for 30 pound bond (average letter-quality paper) seems to be around 2.0 cents per sheet.

A slightly cheaper method to go, assuming you want to use your printer for relatively unimportant things like LISTing programs and so forth, is to buy a roll of Telex paper, which is made out of newsprint, just like this paper you're reading, which is sold by the roll. The cost of this is around 1.0 cents per 8 1/2" x 11" sheet equivalent. There are a couple of problems with Telex paper, however. One is that there are no perforations anywhere, so you have to rip it just above the paper press while holding the paper with your other hand on the platen. (Watch out for little bits of paper which will drop down inside the printer!)

The second problem with Telex paper is that it is only 8 and 7/16" wide. I found that it is very tricky to get it to run straight up and down in the printer -- it usually starts to drift off to one side. So don't try and LIST any monster programs and leave the machine unattended.

***

Another Gemini-related tip:

One of the nice features about the Gemini is that is uses regular typewriter ribbons. Unfortunately, there is a problem with the metal eyelets near each end of the ribbon which are supposed to get caught in the ribbon guide slits and reverse the ribbon's direction. Some of these eyelets are so thin that they will pass right through the slit, and might follow the ribbon's path so they end up under the print head. This qualifies as One Of The Really Dumb Things You Can Do With Your Printer. Yes, folks, I did it myself, but the print head escaped unscathed. It seems to stop whenever it encounters a thick obstacle (if you are trying to type on a sheet of cardboard, for example), but perhaps I was just lucky in this case.

The way to avoid potential disaster is to buy some snap fasteners, which are sold in fabric stores. These are similar to the metal eyelets, only much thicker. Snap these into place just before the eyelets on the ribbon, and there should be no problems.

---

# VIC LIBRARY Blurbs

BY TONY SMITH, VIC LIBRARIAN

Summer is here and the real computer freaks still can be found emerging from basements at 3:00 A.M., glassy-eyed after bashing in a program and debugging at least five versions.

You can tell the REAL freaks in the summer: skin like a beluga whale, so pale he/she glows in the dark. Gone are the gloves and scarf needed to keep the subterranean chill off (why do we always get banished to the basement?). No more Dickensian teardrop on the end of the cold nose. NO ... it's summer, real nerds have switched to shorts, even though it's cool down here.

Here we are: cup of cold coffee, pile of cigarette butts, 18 different colour pens; surrounded by mounds of books and magazines, that's US ... the REAL NERDS.

Don't worry about a war, we will survive! Humankind will re-new, a race of pallid mumbling creatures with a pocket full of writing instruments. The system can't get to us, we are too detached ... we wouldn't notice.

Then the big one; the family is going to the beach and as the duly licensed member of the family ... you gotta go too! The sizzling sunlight is like a lash, like Barabbas emerging from the mines after 10 years underground.

Hmmmm... this isn't so bad after all, an endless litany of chanting waves. But wait ... what's this?

Have you noticed that the waves seem to come in sets of eight? I wonder how many grains of sand are in a cubic foot. This seaweed has sections in sets of sixteen. I gotta build a battery pack for the VIC ... could set it up on this log over here ... Hmmm ...

Anyway, as a result of some ardent but not too fruitful collecting and bashing, we did come up with a new disk release for July. A summary is printed on another page.

There were some very useful utilities submitted by the midnight bit-bashers as well as more games and demos. thanks to those who contributed. The library depends on submissions from members to sustain and expand its contents. If you have an original program of your own or one (or some) that you have punched up from a magazine or book, we would be grateful to have a copy. Your disk or tape will be returned and your name (if you have no objection) added to the program in the master disk. All donations are gratefully received.

From now on the library will be available only at the meeting of the VIC/C-64 workshop at Killarney School. In order that we may all participate at the general meeting, the software will not be available at Sunset Centre meetings. This means that now the loan period for a disk or tape is approximately one month, or more specifically from one VIC/C-64 meeting to the next.

You are responsible for the safe keeping and timely return of the software as there are others waiting to use the programs. Please return the correct slip cover with the disk, or the plastic box in the case of tapes when you return

# WAIT A MOMENT!

BY MIKE QUIGLEY

If you're a lazy person like me, you don't like games which use the joystick or paddles and require you to input various things from the keyboard -- for example, "Y" to start another game when one is finished.

One method to overcome this, as documented in the January 1983 issue of COMPUTE! (pp. 153-158) is the use of the WAIT instruction. The VIC-20 Programmer's Reference Guide says of this command: "...this statement should never be used ... {it} is used for arcane I/O operations and almost nothing else."

Well, folks, such is not the case! WAIT is the answer to a lazy person's dream.

If you examine many BASIC games programs, you will find a line at some point, probably near the end, where you're asked for input to determine whether or not you want to continue, something like "GET A$:IF A$="" THEN {here is found the line number of that particular line}". This is followed by "IF A$="Y" THEN RUN {or GO TO a particular line number to continue with the game}" and "IF A$="N" THEN END {or some silly farewell message like "BYE" ... sorry about that, they're one of my pet peeves}.

You should replace this "GET A$" statement, etc., with the following:

```
WAIT 37137,32
WAIT 37137,32,32
RUN {or GO TO a line}
```

This allows you to push the joystick fire button to start the game up again without touching the keyboard. Of course, this denies you the pleasure of pushing "N" to stop the game, but you're going to RUN/STOP and RESTORE anyway, right?

WAIT can also use the various directions of the joystick as well. For the number "32" in the above example, substitute the following:

```
JOYSTICK LEFT -- 16
JOYSTICK UP -- 4
JOYSTICK DOWN -- 8
```

The WAIT business for JOYSTICK RIGHT is somewhat more complicated. You must type POKE 37154, 127 before and POKE 37154, 255 after the WAIT instruction, which is also changed, so the result looks like the following:

```
POKE 37154,127
WAIT 37152,128
WAIT 37152,128,128
POKE 37154,255
```

***

The VIC user port, where things like modems and printers can be connected, can also be used for a second joystick. While there aren't many games available commercially for the VIC which feature two joysticks, another issue of COMPUTE! (March 1983, pp. 138-142) has a game --

Fighter Aces -- for two joysticks, an an accompanying article which tells you how to construct a second joystick. (Second joystick ports are available commercially in Vancouver for a cost of around $20.)

The second joystick port can also be used with the WAIT instruction. You have to first change our basic formula to:

```
    WAIT 37136,N
    WAIT 37136,N,N
    where "N" is a particular
```

number as follows:

```
    FIRE BUTTON -- 32
    JOYSTICK UP -- 4
    JOYSTICK DOWN -- 8
    JOYSTICK LEFT -- 16
    JOYSTICK RIGHT -- 2
```

***

Finally, let's take a look at how WAIT can be used with your paddle controls. Here, we will rely on the old maxim: "A program is worth a thousand words", and present the following brief demonstration:

## Bulk buy policy

Now that the club is 300 strong and growing, computer hardware and software dealers are willing to give club members special offers on their products. Until now such arrangements have been on a casual basis and some problems have occurred as a result. To help ensure that the club members are protected in the future, the BULK BUY CONDITIONS outlined below were adopted by the club executive at a recent meeting. The conditions below also keep the club in good standing with Victoria as a non-profit society. If you have any comments or suggestions about these conditions, feel free to corner one of the executive and tell them your story.

1) Terms and conditions of offer must be presented in writing to the group through the club executive or a designated representative a minimum of one week prior to the announcement of the offer at a club meeting.

2) Approved offers will be announced at club meetings by an appointee of the club executive but no direct canvassing (e.g. by telephone) of individual members for the purpose of increasing sales is permitted. Further, no promotion will be done by the club to further sales.

3) Terms and conditions of sale must be presented in writing to all purchasers at or before the time of first payment to include a clear statement that the club, club executives, and their representatives are not in any way directly involved in the transaction and thereby bear no responsibility or liability for the condition or performance of the product.

```
5 PRINT"{SC}"
6 PRINTCHR$(28);"PUSH EACH PADDLE FIRE
BUTTON TO SEE WHAT    HAPPENS...{CD}";C
HR$(144)
10 DD=37154:PA=37151:PB=37152
30 GOSUB9000
35 IFY=1THENGOTO40
37 IFX=1THENGOTO50
38 GOTO30
40 POKEDD,127:WAIT37152,128:POKEDD,255:
PRINT"THIS IS Y":GOTO30
50 WAIT37137,16:PRINT"THIS IS X":GOTO30
9000 POKEDD,127:Y=-((PEEK(PB)AND128)=0)
:POKEDD,255
9010 X=-((PEEK(PA)AND16)=0):RETURN
```

The important lines here are 40 and 50, which will be have to be inserted at the point where the game ends and you want to restart it (or where you want some other fire-button-activated activity to begin). The variable DD (equal to 37154 in line 10 above) will probably be established elsewhere in your program, likely at the beginning. It might be under a different variable name.

4) No distribution of product is to occur at the club meeting without authorization from the club executive committee prior to the club meeting.

5) In relation to bulk purchases, no exchange of cheques, money or credit cards is to occur at any time at club meetings or on the premises of the meeting, no money or cheques will be handled by the club executive or its representatives in any way.

6) Announcement of a proposed bulk purchase to the club meeting does not constitute implied or direct endorsement of any product or service by the club, its directors, or its representatives.

7) Preference will be given to authorized Canadian dealerships providing full service warranty, and after-sale support for product or service.

and carried out only when all potential problems have been sorted out.

(Note: We have tried a number of projects recently without this careful planning. Pushed into accepting them because people wanted instant gratification, we are left with events that didn't happen, incomplete records and other problems, exactly as our past experience would have predicted. The methodical approach takes more time and more people, but the benefits are worth waiting for.

4. Problems and complaints examined carefully and completely before any action is taken in response to them. Sometimes the cure is worse than the disease.

Best wishes for the future to the COMMODORE COMPUTER CLUB.

Be patient and take care,

-- Niels

**COMMODORE 64™**

# C-64 DISC LIBRARY LISTS

## "CCC LIBRARY DISK" 01 2A

| | | |
|---|---|---|
| 1 | "C-64 WEDGE" | PRG |
| 24 | "BLACKJACK" | PRG |
| 14 | "TARGET PONG" | PRG |
| 23 | "ANDROID NIM 64+" | PRG |
| 38 | "ATARI II.C2" | PRG |
| 25 | "ENTERTAINER" | PRG |
| 37 | "LABYRINTH" | PRG |
| 13 | "KEYBOARD" | PRG |
| 24 | "DISK DOCTOR" | PRG |
| 17 | "PETALS/ROSE" | PRG |
| 76 | "CASTLE ADVENTURE" | PRG |
| 16 | "MAXIT" | PRG |
| 23 | "HANGMAN" | PRG |
| 29 | "SOLITAIRE" | PRG |
| 27 | "BOSWAIN" | PRG |
| 20 | "YAHTSEE" | PRG |
| 42 | "PERSONALITY TEST" | PRG |
| 43 | "ARTILLERY.C2" | PRG |
| 2 | "AQUA 2" | PRG |
| 7 | "TIME GUESSER" | PRG |
| 69 | "PIRATE ADV" | PRG |
| 91 | "AFRICAN ADVENTUR" | PRG |
| 4 | "DOS 5.1" | PRG |

0 BLOCKS FREE -

## "CCC LIBRARY DISK" 02 2A

| | | |
|---|---|---|
| 1 | "C-64 WEDGE" | PRG |
| 4 | "DOS 5.1" | PRG |
| 4 | "HIRES VIEW 2" | PRG |
| 2 | "HIRES VIEW 2.MAC" | PRG |
| 32 | "1-DOLLAR" | PRG |
| 32 | "2-MAP" | PRG |
| 32 | "3-DBL BESSEL" | PRG |
| 32 | "4-KAREN" | PRG |
| 33 | "5-DIP" | PRG |
| 20 | "FRENCH 64" | PRG |
| 9 | "STANDARD.SET" | PRG |
| 28 | "SINGLE BACKUP" | PRG |
| 5 | "MOUSE" | PRG |
| 71 | "ADVENTURELAND" | PRG |
| 9 | "SPRMON.SYS51201" | PRG |
| 11 | "DOS IN BASIC" | PRG |
| 11 | "RES MDRT" | PRG |
| 89 | "MUSIC MAKER" | PRG |
| 20 | "GRUNGY TOWERS" | PRG |
| 88 | "SUPERTREK 64+" | PRG |
| 9 | "SUPERDOS2#7000" | PRG |
| 3 | "SPRITE BOOT" | PRG |
| 43 | "SPRITE EDITOR" | PRG |
| 2 | " SCROLL.DATA" | PRG |
| 3 | "SAMPLE SPRITES" | PRG |
| 33 | "SPRITE INSTR." | PRG |
| 4 | "CHAR BOOT" | PRG |
| 32 | " CHAR EDITOR" | PRG |
| 1 | " ROTATE.DATA" | PRG |

1 BLOCKS FREE -

## "CCC LIBRARY DISK" 03 2A

| | | |
|---|---|---|
| 20 | "AFRICA & ASIA" | PRG |
| 12 | "EASY ADD & SUBTR" | PRG |
| 15 | "20 QUESTIONS" | PRG |
| 6 | "ADDITION GAME" | PRG |
| 2 | "ASK" | PRG |
| 11 | "BIG MATH 1.1" | PRG |
| 9 | "CASH REGISTER" | PRG |
| 5 | "CRYPTOGRAM" | PRG |
| 8 | "DONUTS" | PRG |
| 24 | "ELIZA" | PRG |
| 10 | "EUROPE" | PRG |
| 6 | "FRACTIONS" | PRG |
| 11 | "FRENCH VERBS" | PRG |
| 5 | "GRAMMAR" | PRG |
| 13 | "HAIKU 5" | PRG |
| 11 | "HANGMAN" | PRG |
| 11 | "HANGMAN(HJS)" | PRG |
| 7 | "MATH DICE" | PRG |
| 13 | "MATH TUTOR" | PRG |
| 7 | "MISSING NUMBER" | PRG |
| 9 | "NO" | PRG |
| 15 | "PETS" | PRG |
| 19 | "SPELLING BEE+FIL" | PRG |
| 19 | "STATES&CAPITALS" | PRG |
| 12 | "US PRESIDENT QUI" | PRG |
| 12 | "WORLD CAPITAL QU" | PRG |
| 6 | "TYPING DRILL" | PRG |
| 18 | "VOCAB 1" | PRG |
| 13 | "ANIMAL" | PRG |
| 27 | "READER" | PRG |
| 13 | "MATH.QUIZ" | PRG |
| 10 | "ANIMAL.DATA" | SEQ |
| 11 | "NOT.SD.EASY" | PRG |
| 13 | "SPELLING.TEST" | PRG |
| 14 | "Q'S & Z'S" | PRG |
| 23 | "DISPLAY" | PRG |
| 4 | "HISTOGRAM" | PRG |
| 27 | "EDU-TILITIES" | PRG |
| 10 | "EUROPEAN CAPITOL" | PRG |
| 20 | "FISHERY" | PRG |
| 8 | "FLASH CARDS" | PRG |
| 10 | "FRENCH" | PRG |
| 6 | "GLOBAL" | PRG |
| 23 | "ICE CREAM PAR" | PRG |
| 26 | "MATH IQ" | PRG |
| 27 | "HANGMAN 2" | PRG |
| 24 | "JUMBO JET" | PRG |
| 28 | "SINGLE BACKUP" | PRG |

11 BLOCKS FREE -

## "CCC LIBRARY DISK" 04 2A

| | | |
|---|---|---|
| 42 | "SPACE PILOT" | PRG |
| 42 | "SNAKES" | PRG |
| 14 | "P&L PLOTTING DEM" | PRG |
| 10 | "SPRITE DEMO" | PRG |
| 9 | "3-D DEMO" | PRG |
| 2 | "M/L DRAW DEMO" | PRG |
| 65 | "STAR TREK IV-A" | PRG |
| 38 | "SPRITE MAKER" | PRG |
| 38 | "ATARI" | PRG |
| 44 | "MASTER MIND" | PRG |
| 2 | "PETSIM" | PRG |
| 12 | "TRACK & SECTOR" | PRG |
| 8 | "MENU" | PRG |
| 2 | " DIRECTORY " | SEQ |
| 12 | "XMON64L(BASIC)" | PRG |
| 12 | "XMON64C(50135)" | PRG |
| 12 | "XMON64H(29700)" | PRG |
| 12 | "XMON64T(38083)" | PRG |
| 10 | "SHOOT" | PRG |
| 5 | "SEQUENTIAL FILE" | PRG |
| 13 | "RANDOM FILE" | PRG |
| 19 | "DISASSEMBLER DIS" | PRG |
| 16 | "DISK CHECKER" | PRG |
| 7 | "DISK VIEWER" | PRG |
| 9 | "DISK LOGGER" | PRG |
| 6 | "SECTOR PRINT" | PRG |
| 7 | "DSK VIEW/CHANGER" | PRG |

196 BLOCKS FREE -

## "CCC LIBRARY DISK" 05 2A

| | | |
|---|---|---|
| 70 | "PONZO TUTOR-1.64" | PRG |
| 67 | "PONZO TUTOR-2.64" | PRG |
| 74 | "PONZO TUTOR-3.64" | PRG |
| 64 | "PONZO TUTOR-4.64" | PRG |
| 67 | "PONZO TUTOR-5.64" | PRG |
| 61 | "PONZO TUTOR-6.64" | PRG |
| 60 | "PONZO TUTOR-7.64" | PRG |
| 12 | "LISTER.V64" | PRG |
| 4 | "1525 CHAR.EDIT" | PRG |
| 7 | "TIME VEN INST" | PRG |
| 7 | "TIM VEN SET UP" | PRG |
| 18 | "TIME ADVENTURE" | PRG |
| 4 | "SAVE FILE(S) PRG" | PRG |
| 4 | "SAVE FILE(S) SEQ" | PRG |
| 28 | "SINGLE BACKUP" | PRG |
| 33 | "SPRITE INSTR." | PRG |
| 10 | "64 MEM CHART.GR" | PRG |
| 3 | "INDEX HARDCOPY" | PRG |
| 3 | "INDEX HARDCOPY 2" | PRG |
| 8 | "INDEX HARDCOPY 3" | PRG |
| 19 | "WORLD CLOCK" | PRG |
| 11 | "SUPER CHASE" | PRG |
| 25 | "STARTREK" | PRG |

5 BLOCKS FREE -

## "CCC LIBRARY DISK" 06 2A

| | | |
|---|---|---|
| 3 | " LIBRARY NOTES " | PRG |
| 7 | "SCRLL.LDR.TAPE" | PRG |
| 46 | "SPRT.EDIT.TAPE" | PRG |
| 25 | "SIDMON" | PRG |
| 26 | "SOUNDER" | PRG |
| 11 | "DOS IN BASIC" | PRG |
| 88 | "SUPERTREK 64+" | PRG |
| 48 | "ADVENTURE-64" | PRG |
| 9 | "ADVF 0" | SEQ |
| 5 | "ADVF 1" | SEQ |
| 4 | "ADVF 2" | SEQ |
| 3 | "ADVF 20" | SEQ |
| 6 | "ADVF 21" | SEQ |
| 5 | "ADVF 22" | SEQ |
| 5 | "ADVF 23" | SEQ |
| 6 | "ADVF 24" | SEQ |
| 7 | "ADVF 25" | SEQ |
| 11 | "ADVF 26" | SEQ |
| 6 | "ADVF 27" | SEQ |
| 5 | "ADVF 28" | SEQ |
| 1 | "ADVF 29" | SEQ |
| 4 | "ADVF 3" | SEQ |
| 5 | "ADVF 4" | SEQ |
| 3 | "ADVF 5" | SEQ |
| 8 | "ADVITM" | SEQ |
| 5 | "ADVKEYS" | SEQ |
| 18 | "ADVMAP" | SEQ |
| 15 | "ADVSHOR" | SEQ |
| 2 | "HIRES VIEW" | PRG |
| 32 | "1-DOLLAR" | SEQ |
| 32 | "2-MAP" | SEQ |
| 32 | "3-DBL BESSEL" | SEQ |
| 32 | "4-KAREN" | SEQ |
| 33 | "5-DIP" | SEQ |
| 22 | "DISK UTILITIES" | PRG |
| 2 | "COMM64" | SEQ |
| 56 | "BACKGAMMON" | SEQ |
| 4 | "PARTITION LOADER" | PRG |
| 6 | "PARTITION /4" | SEQ |
| 13 | "SPEED TYPE 64" | PRG |

12 BLOCKS FREE -

ALL PROGRAMS LISTED ARE AVAILABLE FROM THE CCC LIBRARY (64) SEE GLEN HAZLEWOOD ON A MEETING NIGHT

# VIC-20 DISK LIBRARY LISTS
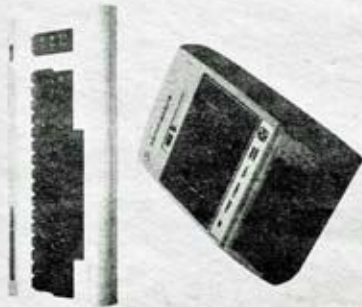
## AA VPUG VIC AA

| | | |
|---|---|---|
| P12 | BIRDS DEMO | P |
| P11 | BUMBLE BEE | P |
| P1 | COLOUR BARS | P |
| P5 | DRAGON | P |
| P3 | FRERE JACQUES | M |
| P13 | GENERAL DEMO | P |
| P3 | GRAPHIC DEMO | P |
| P11 | GRAPHICS&SOUND | P |
| P6 | HANDIC DEMO3 | P |
| P5 | HI RES DEMO1 | P |
| P3 | KALEIDOSCOPE-1 | P |
| P4 | KALEIDOSCOPE-2 | P |
| P6 | KEYBOARD GRAPH | P |
| P6 | MERRY VIC-MAS | M |
| P5 | VIC MEOW | P |
| P8 | SOUND KEYBOARD | M |
| P6 | ROBOTS | P |
| P11 | SOUND EFFECTS | M |
| P11 | MORE SOUND EFF | M |
| P10 | KEYBD SOUNDS | M |

## AB VPUG VIC AB

| | | |
|---|---|---|
| P6 | BASICODE READ | U |
| P7 | BASICODE SEND | U |
| P3 | BIG LETTERS | P |
| P4 | CHECK DISK | U |
| P7 | DIRECTORY | P |
| P11 | DISASM | P |
| P14 | DISPLAY T&S | P |
| P8 | DIS1 | P |
| P4 | HISTROGRAM | P |
| P9 | PERFORM TEST | U |
| P7 | PROGMBL CHARS | P |
| P13 | RANDOM FILE | U |
| P5 | SEQUENTIAL FILE | U |
| P8 | TINYMON INST | A |
| P5 | TINYMON 1 | A |
| P8 | VIC DIS-1 | A |
| P10 | VIC DIS-2 | A |

## AA 2A  60-FILES  178-FREE  0-ALLOCATED

| | | |
|---|---|---|
| P3 | SILENT NIGHT | M |
| P8 | ARROW | G |
| P13 | ARTILLERY | G |
| P11 | BANDIT-1 | G |
| P5 | BARRICADE | G |
| P12 | BIGRYTHM | P |
| P9 | BLACKJACK | G |
| P12 | BUSH TRAIL | G |
| P12 | DAM BUSTERS | G |
| P5 | DEFLECTION | G |
| P10 | DEPTH CHARGE | G |
| P12 | DRAGON MAZE | G |
| P7 | BREAKOUT | G |
| P7 | FOREST DRIVER | G |
| P11 | GRAND PRIX | G |
| P10 | ALIEN RAIDERS | G |
| P7 | LONG DIVISION | G |
| P8 | LUNAR LANDER | G |
| P10 | MOONLANDER | G |
| P12 | MASTERMIND | G |
| P7 | MUKADE | G |
| P11 | OTHELLO | G |
| P11 | PINBALL | G |
| P11 | PING PONG | G |
| P6 | PISTOL PETE | P |
| P10 | RACE | G |
| P8 | ROCKET COMMAND | G |
| P9 | RUGBY | G |
| P9 | SAMU | G |
| P9 | STAR CHASER | G |
| P9 | STAR WAR | G |
| P12 | TRAP | G |
| P11 | SNAKE | G |
| P13 | JUMPING JACK | G |
| P1 | RELOCATE SCRN | U |
| P6 | S-X STRING ART | P |
| P5 | S-X GRAPHIC | G |
| P4 | VIC WEDGE | U |
| P3 | S-X KEYBD GRAPH | P |
| P7 | PRG CLASS VIC | X |

## AB 2A  49-FILES  309-FREE  0-ALLOCATED

| | | |
|---|---|---|
| P11 | VIC DIS-3 | A |
| P4 | VICLOAD-2 | U |
| P4 | VICLOAD-4 | U |
| P6 | VIEW BAM | U |
| P7 | PRG CLASS VIC | U |
| P4 | SEARCHER | U |
| P1 | RELOCATE SCRN | U |
| P4 | VIC WEDGE | U |
| P10 | SUPER VICMON2 | A |
| P8 | HIMEM SAVER | U |
| P7 | VIC AID | U |
| P14 | FRENCH TUTOR | E |
| P3 | REL WRITE | U |
| P3 | CHARS@$1C00 | U |
| P6 | PRG FUNCT KEYS | U |
| P8 | ADDRESS FILE | B |
| P11 | GRAPH PLOT | E |
| P8 | COMPLEX MATRIX | E |
| P4 | 555TIMER DESIGN | E |
| P8 | VIC FINANCE | B |
| P3 | LO PASS FILTER | E |
| P4 | CONTEXT INDEXER | U |
| P11 | COPY-ALL DISK | U |
| P18 | TERM SER-1 | C |
| P7 | TERM SER-2 | C |
| P6 | KEYSORT | U |
| P3 | SORT DEMO-1 | U |
| P6 | SORT DEMO-2 | U |
| P6 | VIC VIC | E |
| P7 | TINY/BASIC AID | U |
| P3 | STRING THING | U |
| P24 | 82 TAX ONTARIO | B |

## AC VPUG VIC AC

| | | |
|---|---|---|
| P4 | VIC WEDGE | U |
| P21 | SATELLITE FINDR | C |
| P13 | BILLBOARD | P |
| P6 | JIM IN COLOUR | P |
| P2 | LOTTARIO | G |
| P7 | PRG CHARACTERS | P |
| P14 | ADDITION PRACT | E |
| P14 | MULTIPLY PRACT | E |
| P14 | SUBTRACT PRACT | E |
| P5 | UXB-1 | G |
| P6 | UXB-2 | G |
| P27 | BACKGAMMON | G |
| P10 | POLY TURTLE | L |
| P10 | ZAP | G |
| P14 | FREE-FALL | G |
| P2 | VISIBLE VIC | G |
| P9 | CALENDAR | U |
| P6 | PRIME FACTORS | E |
| P14 | GOBBLE | G |
| P10 | SPACEWAR-1 | G |
| P10 | SPACEWAR-2 | G |
| P10 | S-X JASPER | P |
| P6 | S-X COLOUR ROOS | P |

## AC 2A  68-FILES  60-FREE  0-ALLOCATED

| | | |
|---|---|---|
| P4 | S-X POOKY | P |
| P13 | S-X GARFIELD | P |
| P2 | S-X HI DEMO | P |
| P2 | S-X TRSHY PIC | P |
| P1 | S-X DESIGN | G |
| P1 | S-X DESIGN-2 | P |
| P1 | S-X DESIGN-3 | P |
| P1 | S-X DESIGN-4 | P |
| P4 | DIGICLOCK | P |
| P12 | HI-RES FOURIER | P |
| P9 | USA SONG | M |
| P9 | MUSIC #1201 | G |
| P10 | 76 TROMBONES | L |
| P9 | ENTERTAINER | G |
| P7 | BRKOUT PADL | G |
| P5 | PENCIL | U |
| P2 | SCROLL | U |
| P13 | GOBBLE (K) | G |
| P13 | THUNDERBIRD | G |
| P11 | STARFIGHT | G |
| P11 | SPACEWARS | G |
| P10 | TANK VS UFO | G |
| P10 | TANK VS UFO (K) | G |
| P14 | MINI GOLF | G |
| P10 | INVADERS | G |
| P7 | CAVERN | G |
| P13 | GOLDRUSH | G |
| P8 | UFO PILOT | P |
| P11 | CHASE | P |
| P9 | FLIP INST | P |
| P12 | FLIP | P |
| P8 | BRAIN WARP | P |
| P13 | JUGGLER | P |
| P8 | SLOT MACHINE | M |
| P9 | REVERSE | M |
| P7 | HIDDEN MAZE | M |
| P11 | SEARCH | M |
| P13 | BUSINESS DEMO | G |
| P10 | MAKING CHANGE | E |
| P2 | PRIME NUMBERS | E |

## AC VPUG VIC AD

| | | |
|---|---|---|
| P4 | VIC WEDGE | U |
| P4 | DIRECTORY | U |
| P7 | PRG CLASS VIC | U |
| P9 | CALENDAR | P |
| P2 | LOTTO 649 | P |
| P8 | MONITOR | A |
| P5 | CHECKBOOK | B |
| P6 | MAIL LIST TAPE | B |
| P4 | NUMERIC PAD | U |
| P7 | FILE CLERK TAPE | B |
| P4 | SCROLL+/- | U |
| P4 | RINGER EOL | U |
| P2 | PAUSE | U |
| P4 | MEMORY SNAPSHOT | A |
| P5 | TRACE | U |
| P7 | COPY DISK FILES | U |
| P2 | SHELL SORT | P |
| P2 | BUBBLE SORT | P |
| P2 | SORT C | P |
| P2 | SORT D | P |
| P12 | MATHMAN | E |
| P14 | GOBBLE | G |
| P5 | PENCIL | P |
| P13 | THUNDERBIRD | G |
| P11 | STARFIGHT | G |
| P11 | SPACEWARS | G |
| P10 | TANK VS UFO | G |
| P14 | MINI GOLF | P |
| P10 | INVADERS | G |
| P7 | CAVERN | G |

## AD 2A  89-FILES  76-FREE  0-ALLOCATED

| | | |
|---|---|---|
| P13 | GOLDRUSH | G |
| P11 | CHASE | G |
| P9 | FLIP INST | G |
| P12 | FLIP | G |
| P8 | BRAIN WARP | G |
| P8 | SLOT MACHINE | G |
| P9 | REVERSE | G |
| P7 | HIDDEN MAZE | G |
| P14 | GOLDRUSH (JS) | G |
| P3 | JOYSTICK DEMO | G |
| P3 | 5K HI-RES | G |
| P6 | COPY CAT | G |
| P24 | ENTERPRISE 8K | G |
| P10 | GRAPH PLOT | E |
| P3 | DISPLAY DEMO | U |
| P13 | OUTPOST | P |
| P8 | DOODLE (JS) | P |
| P8 | COLOUR MASTER | G |
| P10 | VIC DT | P |
| P7 | GUESS 10 SEC | P |
| P4 | RAINBOW CLOCK | P |
| P6 | HEXEDIT | E |
| P10 | MAKE SKETCH(JS) | G |
| P4 | AMORTIZE | B |
| P3 | S-X VIC LOGO | L |
| P4 | S-X SUPER PLOT | P |
| P2 | S-X ALL MY LOVI | M |
| P10 | S-X SPACE ACE | G |
| P9 | S-X XMUSIC MACHIN | M |
| P1 | S-X DIAMOND | P |
| P1 | S-X CIRCULINE | P |
| P2 | S-X SPIRALMANIA | P |
| P1 | S-X TRI-CIRCLE | P |
| P1 | S-X FAN-TASTIC | P |
| P3 | S-X ANOZR DMO | P |
| P4 | S-X DATA DEMO#2 | P |
| P4 | FUEL CHASE | G |
| P8 | ROBOT CHASE | G |
| P1 | UFO LANDING | M |
| P2 | COUNTER | P |
| P2 | MEMORY MUSIC | M |
| P3 | SPACE SHIPS | P |
| P7 | UFO-TANK WAR | G |
| P7 | VIC-20 ORGAN | M |
| P6 | ZAPPER | P |
| P4 | TANK WAR P1(T) | G |
| P9 | TANK WAR P2 | G |
| P9 | ONE ON ONE | G |
| P9 | BATTLE ZONE | P |
| P4 | SMOOTH MOVE | P |
| P6 | BASIC INVADER | P |
| P13 | GALACTIC WAR | G |
| P3 | FIRE PART-1 | G |
| P9 | FIRE PART-2 | G |
| P8 | MANHOLE | P |
| P2 | ANDROID | P |
| P6 | BUG HOP | G |
| P1 | RELOCATE SCRN | U |
| P17 | COL/CHAR EDITOR | P |

## History

Gary Skett taught introductory Commodore BASIC starting February 1983 and Don Lekei gave seminars on the Commodore 64 in April 1983.

Commodore advertising often focuses on education as the position of computing growth, but VPUG offered anyone the garden of computing intelligence. Unleashed from the limitations of scarcity of "computer time", VPUG students made accelerated progress.

When the VIC-20 and Commodore 64 became available, VPUG blossomed with a growth pattern that was truly exponential. Briefly, the 27 members of VPUG in January of 1982 became over 300 members of the Commodore Computer Club by July 1983. The mushrooming was most apparent at the October gathering when Jim Butterfield of the Toronto Pet Users' Group and Doug MacGregor, Commodore's western Canada manager, addressed VPUG. Over half the audience were guests, but membership grew 54% the next month. Last year's Pacific Coast Computer Fair was held that month, so the membership surge coincided with that extra effort.

The next stage was expansion to two monthly meetings in December 1982 -- a workshop and a lecture format assembly. Community centres rent for relatively low cost, but to continue the important workshop aspect of VPUG the club procured Killarney school cafeteria for adequate space in mid-1983. This space is several times the cost of the community centre but the workshop is the fertile environment the club needs to continue to flourish.

Since 1979 there has been discussion of incorporation of VPUG to protect members from lawsuits, a problem plaguing some American microcomputer groups that have been accused of software infringement. Documents effecting incorporation with 15 directors were discussed and signed at VPUG executive meetings in February and March, and on April 22, 1983, Victoria issued incorporation #S-18085 to the group, re-named the Commodore Computer Club, under the Societies Act.

VPUG has become a fond memory, a bit of the nostalgia of history.

## BLURBS

them. Please do not add, change or delete any programs; if you want to make an enhancement to a program, submit a re-written version on a tape or disk to me. You will be credited with the update and your medium returned as stated above.

I hope you enjoy the new release, I enjoyed assembling it. Thanks again to those who donated.

# C-64 POWER SOCKET MODIFICATION
## (TO BE USED WITH THOSE C-64 COMPUTERS THAT HAVE A 4-PIN POWER SUPPLY CABLE)



C-64

POWER SOCKET

ACTUAL SIZE OF STAPLE

STAPLE MADE FROM INSULATED #24 WIRE
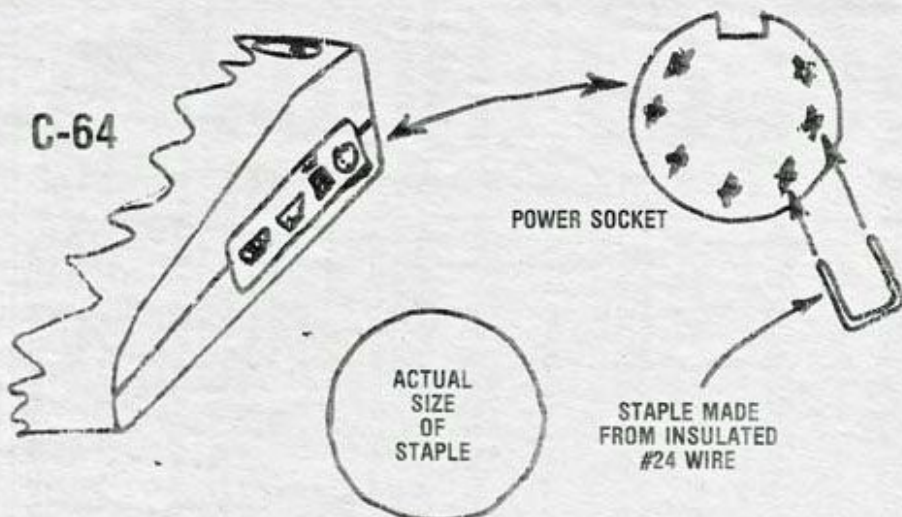
-- This modification will prevent the power supply cable from accidentally being plugged in the wrong way.
-- This modification can be easily removed if it becomes necessary to use a 7-pin power supply in the future.
-- Conti Computers will supply these staples to any of their customers who may have received a C-64 computer with a 4-pin power supply.
ALWAYS MAKE SURE THE POWER SUPPLY IS UNPLUGGED BEFORE CONNECTING IT TO THE C-64 AND THE COMPUTER IS OFF!

## NEW VIC-20 PROGRAM RELEASES

Summarized by Tony Smith, VIC Software Librarian

These programs are available on new disk VIC AE as well as on tape.

UFO PILOT -- Avoid warplane and your own trail (joystick)
BOGGLER -- Place stones on grid and capture (joystick)
A DAY AT THE RACES (G) -- Place yer bets and ... they're off!
RHINO -- Sneak home before the rhino gets you.
SCALES -- Select scale and play notes (keyboard)
PILOT 8K -- Pilot language program (8K required)
TINY PLAN 8K -- Electronic spread sheet (8K required)
MORSE TRAINER -- Teach yourself Morse code
4 COLOUR MAP -- Problem solving, colour areas
SCREEN SW -- ?? Ask Larry P.!!
PETALS/ROSE -- Test your deductive powers
ROMPEEK -- Check into your chips
DISASSEMBLER -- Machine Language aid
BASIC NIGHTMARE -- Just for fun, give this to a "friend".
MORE SOUNDS + -- More menu-driven sound effects
COLOUR EATER -- Great graphic demo
CRITTER -- Interesting fellow ... use him in a game program
S-X JOYWRITER -- Magic screen slate (joystick, Super Expander)
S-X HI-RES DEMO -- Hi-res graphics using Super Expander
S-X CALCULART -- Larry Phillips' famous geometric designs
S-X POLYGONS -- Many-sided figures perform calesthenics
PERMUTE SBRTN -- Permutate any word, great for encrypting
S-X AMORTGRAPH -- Print a graph of your mortgage
BUTTERMORT -- Butterfield's mortgage calculator, prints hard copy
LOAD/RUN DISK -- Load and run PRG from directory
PRG LOCATOR -- Finds the start address of a program (disk)
VICWORD -- Assigns keywords, statements and functions to keys
CHAR GEN 2.0 -- Another good character set modifier
JOYSTICK TESTER -- Find out what happens when you use your J.S.
VIC INVADERS -- More little guys raining down on your city
BIG CHARACTERS -- Interesting display of large characters
PONG -- Game which used to be found in pubs
S-X BOUNCER -- Moving graphics
S-X CLOCK -- Digital clock
HARMONIZER -- Demonstrates harmony in three voices
STEAL MONEY -- Elementary dishonesty learned easily
KALEIDOSCOPE-3 -- Another brilliant display of color in symmetry
VIC MAIL -- Mail list organizer
FUEL 1C -- Analyze auto fuel costs
METEOR MAZE -- Dock your ship, avoid meteors
ASTEROIDS -- VIC version of arcade game
WALL -- Destroy wall for points
BUDGET-1 -- Simple home budget analysis
GUNFIGHT -- Shoot your buddy
RUSS'N ROULETTE -- Shoot yourself
MAIL LIST -- Updated mail list program prints labels and lists
DISC SWAP -- Makes disk copies using a single drive (Great!)

# A COMPLEAT GUIDE TO MACHINE LANGUAGE PROGRAMMING ON THE PET

BY HAROLD
BROCHMANN

## Introduction

The PET has provided many people with their introduction to computers. My wife (who is a novelist) bought our PET a couple of years ago so that she could use it for word processing. The fascination of having that machine around the house proved too much for me, and soon I was spending as much time on the PET as she was - first learning BASIC and then getting more and more versatile with BASIC, and finally delving into the mysteries of PEEKs and POKEs.

As time went on I became increasingly aware that there was something called MACHINE LANGUAGE. I bought several books on the subject, but with my background they didn't help very much. It seemed that the books which were available all started off with the assumption that the reader already knew far more than I did.

Joining the local PET USER'S GROUP turned out to be a very good idea, and through regular contacts with "expert amateurs", I was slowly introduced to the mysteries of machine language programming. It has been a long, frustrating and rewarding process.

The purpose of this book is to save the reader time and frustration in GETTING STARTED with PET machine language. It is intended to help the beginner over the first, most difficult hurdles.

We will start with the assumption that the reader is reasonably proficient with BASIC, and that he is now ready and anxious for another challenge.

## Chapter 1
## Some Background to ML

### POKEING AND PEEKING [1-1]

When you first turn a PET on, you are told that there are so and so many BYTES free. Each of these bytes constitute one unit of MEMORY. The number varies, depending on what size memory your computer has.

Each byte in the computer has an address which identifies it. The first byte has address 0 (zero). The last byte has address 65 535. Each of these bytes contains a number between 0 (zero) and 255 inclusive.

There are two main kinds of bytes... RAM (Random Access Memory) and ROM (Read Only Memory). The difference is that the contents of RAM bytes can easily be changed, while the numbers contained in ROM bytes are "burnt in" at the time of manufacture and cannot be altered.

Just about the simplest thing that you can do with a PET is to look at the contents of a byte and, if it is a RAM byte, change it.

```
PRINT PEEK.(2000)
```

... will reveal the contents of the byte with address 2000.

```
POKE 2000,11
```

... will place the number 11 into address 2000.

```
PRINT PEEK(2000)
```

... will tell us that the POKE command worked.

Try poking address 2000 with various numbers. You should verify that only numbers in the range 0 - 255 work. Numbers outside this range are considered illegal.

Peek and poke addresses in the range 40 000 to 50 000 to verify that these addresses contain ROM.

### MEMORY ORGANIZATION [1-2]

This illustration shows what is called a MEMORY MAP. The lower numbered bytes are shown at the top of the map which is called the bottom of memory!

RAM bytes are divided into three groups. Bytes in the range 0 to 1024 belong to the UTILITY area. Bytes in the range 1025 to 32767 are PROGRAM STORAGE bytes. It is here that BASIC programs are stored. If you have an 8K or 16K PET then not all of these bytes will actually be there. Bytes 32768 to 33767 keep track of what is being displayed on the screen.

Bytes with addresses above 33767 are all ROM which performs a variety of functions. Spome of them are used for INTERPRETATION of BASIC, while others contain the OPERATING SYSTEM. Yet others are used for INPUT and OUTPUT.

We will now examine some of these areas in greater detail.

### SYSTEM MEMORY MAP

| Address | Type | Description |
|---|---|---|
| 0000–00FF | RAM | System page zero variables |
| 0100–01FF | RAM | 6502 hardware stack area |
| 0200–029F | RAM | BASIC input buffer |
| 02A0–03FF | RAM | System absolute variables |
| 0400–7FFF | RAM | 32K CBM BASIC text area |
| 0400–3FFF | RAM | 16K CBM BASIC text area |
| 8000–87FF | RAM | CRT display RAM |
| 8800–8FFF | | User I/O address space |
| 9000–AFFF | | User ROM |
| | | User I/O |
| B000–E7FF | ROM | BASIC Interpreter |
| E800–EFFF | | System I/O |
| F000–FFFF | ROM | Operating System |

TO BE CONTINUED
IN FUTURE ISSUES...