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The INDEPENDENT Commodore Users' Magazine

No. 21 July 1983

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TPUG
Conference
Report



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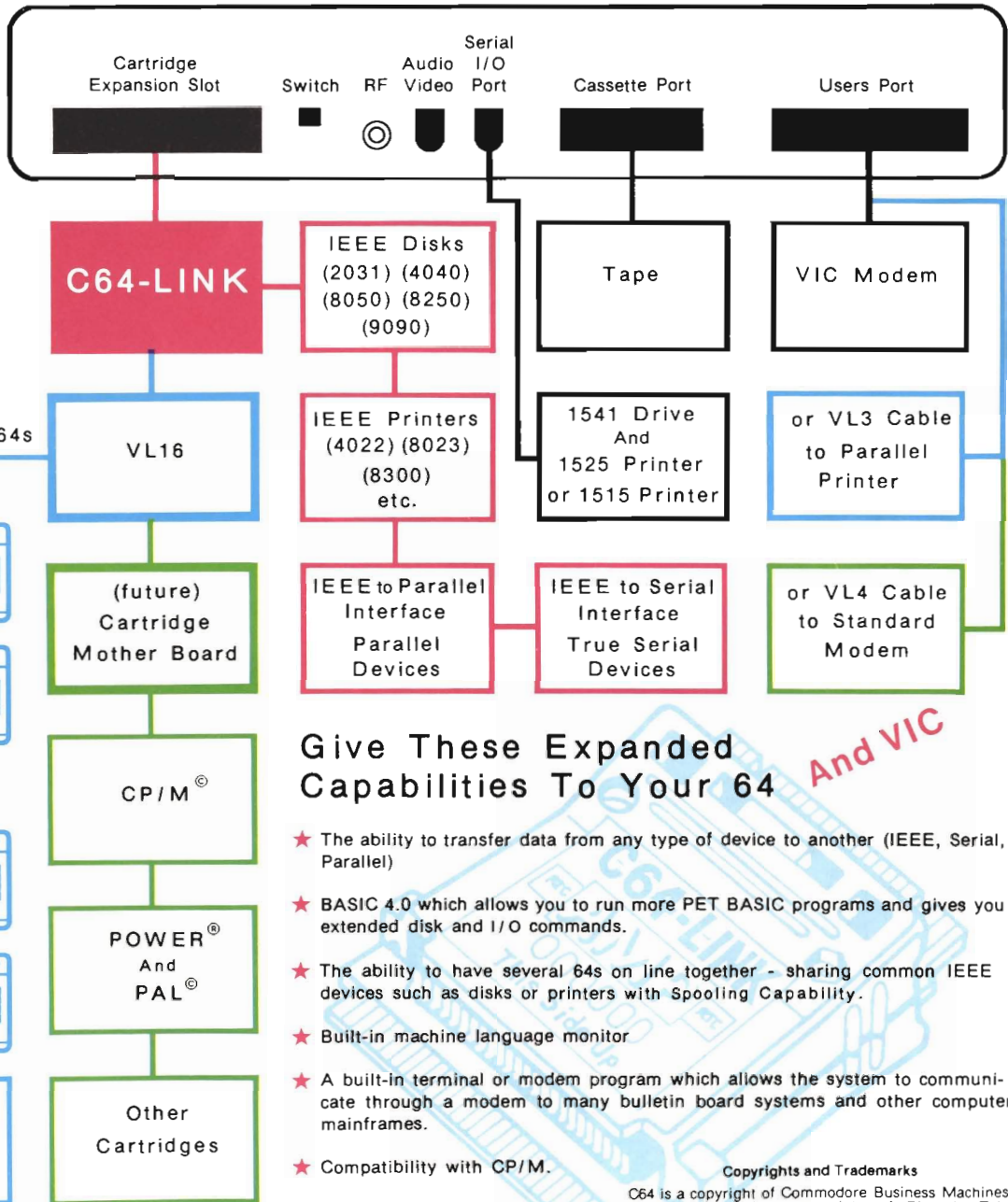
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Contact your local Commodore dealer or RTC.

CONTENTS

PAGE		
2	Good Housekeeping Again	Editorial Comment
3	LETTERS TO THE EDITOR	
4	Conference Wrapup	Gord Campbell
6	Dealer Exhibition.	Terry Herckenrath
8	Programmers Do It In Software (Part 3)	Hal Chamberlin
15	Re-inking Printer Ribbons	J. Bos
16	CHIPP!	Mike Richardson
17	C-64 Link.	Todd Hamilton
18	Byteds	Bill Yee
19	Easy VIC Reset	Victor Chan
20	VIC Editype and Four Programs for Expanded VIC	Richard Best
27	Butterfield Box (String Along With Me).	Jim Butterfield
28	More About Fuzzy Numbers	R. Richard Amari
29	Scopy 5.0 Instructions	Keith Peterson
31	Herckenrath Box (Stick to VIC).	Terry Herckenrath
32	That \$28 Modem And Your PET!.	Richard Bradley
34	NEW PRODUCTS.	
39	SuperPET APL Disc Review	Carol Shevlin
41	"Getting Started"	Betsy Byrne
42	MEETING REPORTS.	R. A. Russell
43	Views From The Better Half	Marty Campbell
43	Calender of TPUG Events	Doris Bradley
44	HELP!	Doris Bradley
45	Classified	
47	New Library Releases	
48	TPUG's This and That	Doris Bradley

The TORPET
published by
The Publisher
Horning's Mills, Ontario
Canada L0N 1J0
(519) 925-5376
(416) 782-9252

U.S. Agent: Advanced Marketing
1 Brinkman Ave., Buffalo, N.Y., 14211

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Published monthly (except April and December)
Single subscription rate - \$18.00 per year

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Special bulk rates to clubs

Printed In Canada
ISSN # 0821-1809
Second Class Mailing Permit Number 5918
Mailed at Shelburne, Ontario
Application to Mail at Second-Class Postage Rates is Pending at Buffalo, N.Y.

Cover Credit: Graham Bailey Studio
Cover Story: The Dealer Floor at TPUG's 1983 Conference.

POSTMASTER: Send addresses to The TORPET, 1 Brinkman Ave., Buffalo, N.Y., 14211

EDITORIAL

Attention

Dear Sir:

I would like to express my experience with one of your advertisers, Progress Computers. I had been trying to locate a source for File Cabinet for about one year. Last Oct. I saw the ad in TORPET and ordered the program. My cheque cleared the bank the following month.

In February I had not received the order and so I wrote a second letter with no response. I then tried to call. I was given the name of Chester Lewis and another 'phone number. Now, six months later, \$35 lost, plus the cost of several 'phone calls, I can get no response. I would still like a copy of the database program.

Any suggestions?

John W. Mahaffey,
Pres.
Memphis, TN

Dear Sirs:

On October 30th. I ordered a program called "File Cabinet" from an advertisement in "The TORPET". The cheque was cashed sometime around January. I have written to them many times and have yet to even get a reply. The program cost \$35.00 and I can get a copy of the cancelled cheque. I would greatly appreciate any help you could give me. The program was ordered from Progress Computer, 7073 Lynnetree Way Citrus Heights, CA., U.S.A. 95610.

Thank you.
Sincerely yours,
Jim Borst
Ellsworth, Wisconsin

Good Housekeeping Again

As we have mentioned before **The Torpet** is not the **Good Housekeeping** of computers. Neither are we a **Consumers Guide**. We neither give a seal of approval nor do we rate the products. The products reviewed in our columns have not been independently tested or independently reviewed by us.

That is not to say that it isn't a good idea. We simply don't have the manpower to do the job.

On the other hand, we do try to take what precautions we can. For example we turned down for this issue with regret (and we sincerely mean **regret** a full page ad, two smaller ads, and a color insert because we did not feel they were in our reader's best interests.

The color insert dealt with a new monitor for which we have not as yet been able to get an independent review. This would not always be a requirement but we have had several letters from readers complaining about monitor performance. (We will try to publish them along with replies in the next issue.) That ad was a hard one to resist because it came with both promises of future full page advertising and threats if we did not carry it.

The other full page of advertising that we discontinued also struck us equally hard. It was really innocuous, which is at the other extreme of the scale, and you may then wonder why in the world we would refuse it. The reason is that it is what we would call an "institutional" ad. It didn't tell you anything. It just presented the name of the advertiser. This, admittedly, may well be important to, and beneficial for the advertiser. But we don't feel such a non-informative ad is that beneficial for our readers and since it just takes up otherwise valuable space we let it go.

Most publications would not turn down ads of this type, and we may be crazy to do so, also. The point is that we view ourselves as more than a publish for profit publication (although we are that also). We are trying to be a service publication. Admittedly, every publication, even Playboy, must offer something to its readers or they wouldn't buy it.

But I guess what I am trying to say is that we would like to be a Good Housekeeping of Commodore Computers, or a Consumer's Guide but we just don't have the resources to do it. Still, when our readers complain about a particular product we try to respond. Those letters to the editor in this issue about File Cabinet caused us to drop paid in advance advertising.

Another ad that we had in place for the last issue was pulled out right at press time and replaced with a cartoon because the executive of TPUG complained that it contributed to piracy. So we do listen to your concerns.

Please don't get the idea that we are cavalier about our advertisers. When we get a complaint we give the advertiser an opportunity to respond. And we try to be reasonable about our decisions. We need our advertisers. They are a major source of revenue for paying the printing bill.

While we are mentioning the printing bill, next month we plan to go to 96 pages. That is double our present size, and with our expanding circulation we will need more and larger advertisers. In the past we have been in the fortunate position of having more advertisers than we have had room for ads. Hopefully, this will continue to be the case but for now with the larger format and the need for more ads we are looking for more advertisers. So if you know of any potential ones, **please** tell us about them.

One more thing about this Good Housekeeping and Consumer's Guide thing. We are beginning to arrange for more and more independent reviews of products so if you do have a product you would like to have reviewed please do send it to us and we will try to make arrangements. I hope saying this doesn't suddenly open a floodgate but we can handle more than we are doing.

But readers, please still beware, we still don't promise a "Seal of Approval" or a "Rating" between various products.

The Publisher

Letters to the the Editor

I certainly look forward to the receipt of my monthly copy of 'The TORPET'. It assures me that many others out there are sharing similar interests (and frustrations)! The contributions of many, through articles and programs have kept me going. Perhaps one day I will be able to pass along a little assistance myself.

(The new tape/disk I.D. system makes sense!)

Vic Sinclair #4197
Lively, Ontario

Congratulations on a fine organization. I thoroughly enjoy the TORPET magazine.

Ronald I. Gamble #6366
Brockville, Ontario

TORPET is good. Your exchange is outstanding. Wish Commodore was better represented in the States. But, they seem to have a bad case of "shoot yourself in the foot" syndrome.

Tom Owen #0971
Raleigh, North Carolina

The March/April and May issues of TORPET were very well done, plus I enjoyed reading them and LEARNED quite a bit.

John Pereira #6446
Mississauga, Ontario

Just a note of congratulations on the various improvements in your magazine TORPET over the years. As you can see from my membership number, I have been with the group for many years and have purchased first, all of the tapes available at that time and now, several of the disks I could find useful.

I especially enjoy the Club Activities report on the happenings at the various meetings. Often there are bits of information in it regarding special instruction tips which I find most helpful in supplementing the lack of documentation for certain programs you have available on your monthly disks.

Thank you for your help and may I offer my best wishes for the success of the club and your most interesting magazine.

Lloyd Wright VE3CFR #0258
London, Ontario

My husband and I attended your conference on May 14 and 15, and were very pleased with the topics covered, and the information we acquired through this card. Keep up the good work.

You deserve a lot of credit for the many hours of work put into this project.

(Mrs.) Diane McDermitt
Kitchener, Ont.,

Incidentally, I enjoyed the conference very much and learnt a lot. The organization was superb (and I say this as one who has organized international conferences for the last 28 years!)

L. F. Jarrett
Nepean, Ont.,

Correction

In the article "Some Mixed-mode Graphics Subroutines In BASIC" by William R. Frenchu in the June issue, line 20080 should have read...

20080

```
Z=320*HY+8192FOR I=0 TO (HB+LEN(I5))*8:POKE  
Z+I,0:NEXT:RETURN
```

Sorry for the inconvenience.

Why a "themeless" issue

We like to give each issue a theme, such as music or games, and will do so in the future. The only problem is that we receive good articles which we want to publish but either do not fit into any of the themes or there was not room for in that particular issue. Not wanting to deprive our readers of anything, we decided to print a number of these articles in one issue, this one.

Thus, this issue appears to be a bit of a mixture, and it is! We believe that you will enjoy these articles. We have also included a couple of articles about the conference, although we had hoped to print more about the speakers.

Hope you enjoy reading this issue!

Sandra Waugh
Associate Editor

To our contributors: past, present, and future:

The TORPET still pays \$20 per page for articles and we welcome new submissions. We do have a small backlog of articles which we have not yet been able to fit in.

We are trying to get to everything. We plan, in the near future, to have letters prepared to acknowledge the received articles, but this will take some more time before it is implemented.

Send us a letter explaining the types of articles you would like to write. Frequently we need a special subject covered and, if you have indicated an interest, then we can contact you.

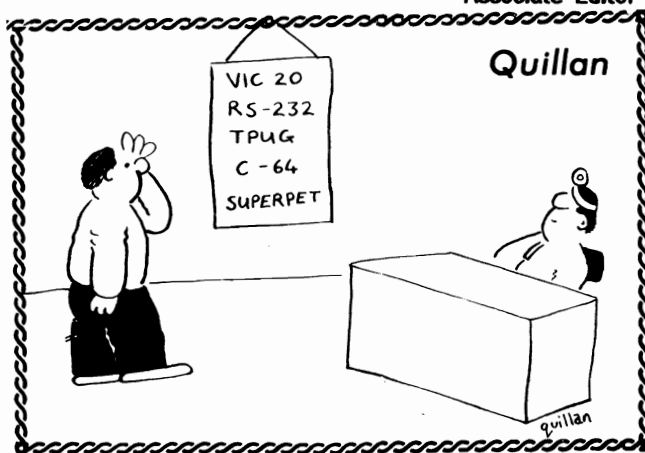
Copyright Policy

Our editorial committee has stated that the non-acceptance of copyrighted material rule is not cast in iron but for the present it remains TORPET's editorial policy that everything it prints is public domain so that new computer clubs can have material for their newsletters.

We also would like for you to share your thoughts about what we are doing right or wrong in TORPET. Write to the editor and tell us your advice.

TORPET needs your help to serve you the best that it can.

Sandra Waugh
Associate Editor



Conference Wrapup by Gord Campbell Toronto, Ont.

The TPUG Conference was quite successful, based on the comments received to date. This success was due to the efforts of many people, most of whom remained in the background.

Special thanks must go to two people who helped out and were unable to attend. **Rob Lockwood** got the ball rolling with the outside speakers, and then found that a major trade show, and the effort to prepare for it, would conflict with the conference.

John Shepherd helped in many areas, only to have his company send him on a business trip to Europe. John was still pitching in the day he left.

Bill O'Brien organized the equipment-handling, and then spent his weekend in the copy centre. **Bob Morrow** got things organized Saturday, a task which was made very difficult when a busload of copiers was late. We did eventually manage to get all the copying done (about 8000 diskettes), although there was a substantial backlog on Saturday evening. For those of you who were unable to pick up your diskettes, the club office is trying to make sure they get back to you by summer.

Jim Carswell was the main intertace to George Brown College, and did quite a job of 'crisis management' throughout the conference. **Dave Fraser**, the Campus Manager, helped tremendously in pointing out mistakes to avoid.

The smoothest part of the whole conference was the dealer area, thanks to the effort of **Terry Herckenrath**. All the dealers who attended seemed to do tremendous business.

Rosemary Beasley put a terrific effort into signs for the conference. People actually seemed to be able to find the speakers this year.

Dave Williams not only enrolled Rosemary, but also got the 'Traders Corner' organized. While there wasn't an enormous amount of equipment offered, it was definitely a success.

Al Farquharson helped organize people

to introduce the speakers, and pitched in wherever it was needed, as did **Keith Falkner** and **Mike Hyszka**.

The club librarians did a superb job of organizing the best material from the past, as well as about 10 disks of new material. People who only brought a couple of disks had difficulty deciding what to get.

Jim Butterfield wasn't supposed to work for the whole weekend, but that's the way it worked out in the end. The 'Introduction to Machine Language' was extremely well received according to my spy, and he then spoke twice on Sunday.

All who attended owe a debt to the speakers. The list is too long to mention them all, but the presentations were generally well-prepared and quite useful.

The individuals and organizations who loaned us equipment for the weekend included the **Toronto School Board**, the **Separate School Board**, **Oakwood Collegiate**, **Commodore**, **BMB Compuscience**, most of the **directors of the club**, and **several others**. Many thanks go to all of them. We certainly didn't have anything to spare.

Chris Bennett, **Doris Bradley**, and the **other people from the club office** gave us tremendous support, from preparation right through to cleaning up the last details.

Finally, many thanks to those of you who simply helped out when the need arose. From our President right down to the newest member, everybody showed that they were willing. Without the prospect of such cheerful assistance, the conference would be an impossible task.



Jim Strasma



Peter Spencer



Keith Falkner



Gord Campbell



Dave Williams



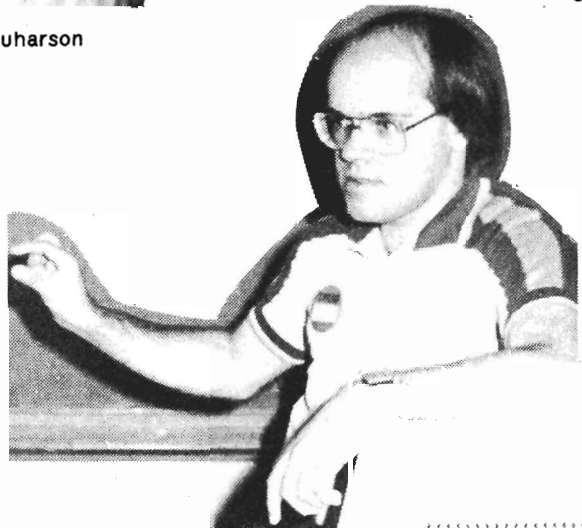
Al Farquharson



Loren Wright



Frank Covitz



Steve Punter

FEATURE

DEALER EXHIBITION

1983 TPUG Conference

BY Terry Herckenrath
Toronto Ont.

The 1983 TPUG Conference Dealer Exhibition was quite a success. I'm sure that everyone who attended the Conference also visited the Dealer Exhibition.

According to some of the exhibitors, business was better than they had anticipated. Lots of people took advantage of the sharp prices on boxes of diskettes and C-64/VIC-20 software.

I was very pleased to meet Gerald King of KING MICROWARE from Montreal. He started his business in February of this year, manufacturing and distributing software for the VIC-20 and C-64 under licence from ABACUS software in the United States. He offers this software at the advertised AMERICAN prices, in CANADIAN funds. Keep up the good work Gerald!

Some of the other good deals were found at the GUARDIAN DATA PRODUCTS booth. They were demo-ing several different printers, one of which was selling for as low as \$375.00.

The best deal around must have been the 5 cent blank cassette tapes at the TPUG booth. Chris, how DO you DO it?

For the business person there was computer furniture for the office, letter quality daisy wheel typewriters/printers and powerline filters as well as some business software.

The kids sure seemed to like the ADVANTAGE booth. They were forever playing games on the two VIC's and C-64's that Advantage had set up. In fact they played JAWBREAKER II so often that the game's tune was starting to drive me nuts!

Somebody found it necessary to STEAL a second hand game cartridge from the TRADER'S CORNER. I hope it was not a TPUG member as I like to think of members as being decent people. Whoever it was, he/she deserves to be hung by his/her toenails.

Some of the dealers also reported a few thefts. I must say I find it simply appalling that some people cannot enjoy themselves without causing harm to others.

That HAS to be the reason why they do it; computer software and accessories can hardly be considered necessities of life.

Mike Hyszka was showing a CBC reporter around on Saturday morning. The reporter stayed around for almost two hours, talking to people about the Conference. I don't know what was done with the material he gathered.

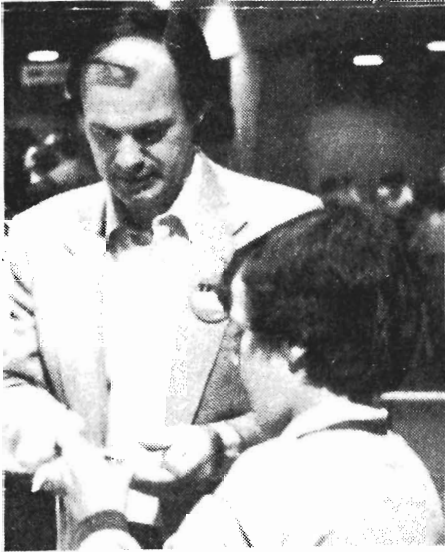
Late Saturday afternoon Chris Bennett drew everybody's attention by firing his 'machine gun', at least it sounded like one. Turned out that he got hold of some of that 'bubble' packing material and unleashed his frustrations(?) on it.

I was just starting to think that the Dealer Exhibition would be free from any sort of trouble, when suddenly, at about one o'clock on Sunday all the lights went out. The gymnasium doesn't have any windows and it also doesn't have emergency lighting, so when the lights went out, boy, was it DARK. Somehow I made my way to the exit to help the security guard make sure that no equipment was being lifted. Except for one man who immediately thought we were picking on him, everyone was very co-operative when we checked their bags etc. as people were leaving the gymnasium. Special thanks to David Bradley, who had the excellent idea to bring his motorcycle inside to shed some light on things.

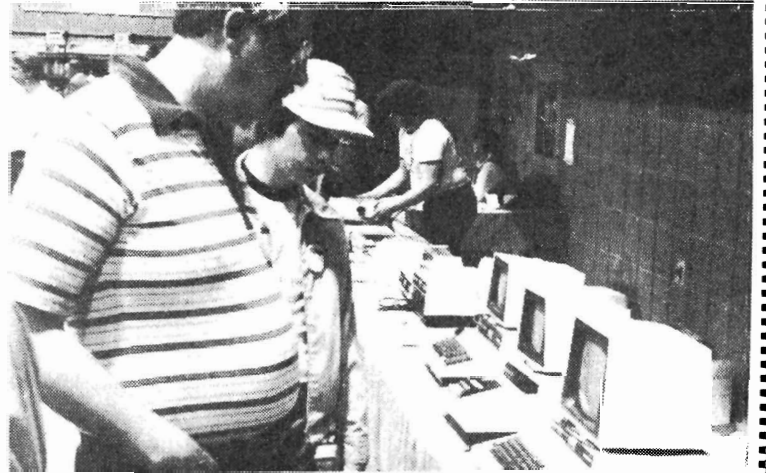
At one thirty the lights came on and everyone simply continued with what they were doing when the lights went out, just as if nothing had ever happened.

This has been the first time that I have been involved in the organization of a TPUG Conference. I realize there must be numerous things that could have been handled better. If you have any suggestions for next year's Dealer Exhibition, please send them to me at the TPUG address. I hope to be able to offer my services again next year, and if not, I'll pass any suggestions along to whoever will be setting up the next Exhibition.

See you all next year!



Mike Bonnycastle



Trader's Corner



*"...and a good time
was had by all."*



Peter Smith

Programmers Do It In Software

Part 3

by Hal Chamberlin

Raleigh, NC

Computing the Samples

Thus the problem of synthesizing sound with a DAC has been reduced to that of computing waveform sample values and quickly outputting them to the DAC. Two constraints, however, keep this from being a simple, straightforward programming task. One difficulty is that reasonably high sample rates, such as 8KHz, allow very little time, such as 125 microseconds, for computing a sample. When synthesizing multiple voices, such as 4, the amount of time spent on each voice has to be around 30uS. Not only must machine language be used, but it must be highly optimized machine language implementing an efficient synthesis algorithm. The other difficulty is that the time between samples must be absolutely consistent from sample-to-sample; even a one microsecond variation will introduce more noise than 8-bit D-to-A conversion does. On some machines such as Ataris, the display may have to be turned off to allow the processor to run at a uniform speed.

The secret to meeting these constraints at all is the use of waveform tables stored in memory. Before the music is played, these tables are filled with values representing the waveshape for each instrument sound desired. The filling process is not subject to the constraints listed above so straightforward machine programming or even BASIC can be used to fill the tables. More on this later.

Assuming that a filled waveform table is available, all that is necessary to "play" the waveform is to write a short loop that scans the table one entry at a time and outputs each entry to the DAC. Since musical waveforms are periodic (repetitive), when the table has been scanned from beginning to end, you "wraparound" to the beginning and scan it again. Each scan through the table will produce one cycle of the tabulated waveform. The number of scans accomplished in 1 second will then determine the fundamental frequency (pitch)

of the generated tone. **Figure 3** illustrates the waveform table concept. Note that wraparound from end to beginning can be visualized as bending the table into a circle.

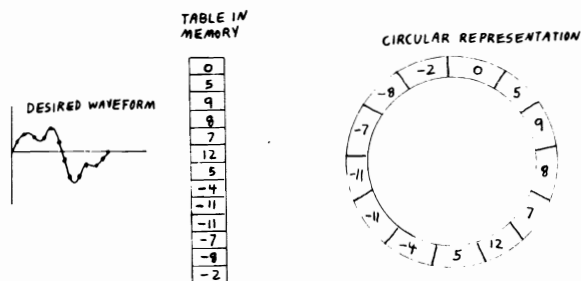


Figure 3. Waveform Tables

If the table is exactly 256 bytes long, then the machine code routine in **Figure 4** will do the scanning job for a single voice. Note the use of the indexed addressing mode for accessing the table. The Y register acts as a pointer into the wavetorm table. When the Y register increments from 0 and reaches 255, the next increment will "overflow" back to zero thus providing the wraparound. It is helpful to visualize the pointer as going around and around the circular table "peeling off" a wavetorm cycle each time around.

Figure 4. Simple 1 Voice Waveform Table Scan Routine

```

LDY #0           INITIALIZE Y
LOOP LDA WVTAB,Y GET A WAVEFORM TABLE ENTRY
STA DAC         STORE IT IN THE DAC
INY             MOVE THE WAVEFORM TABLE POINTER
JMP LOOP        CONTINUE SCANNING FOREVER
    
```

In **Figure 5A** is a routine for producing 4 voices by simultaneously scanning 4 different tables. Every "sample period" (time around the loop), a sample value is read from each table and added up to create a single sample which is sent to the DAC. Thus the mathematical operation of addition is equivalent to the audio operation of mixing several signals into one. Note that the waveform table entries need to be scaled so that when 4 of them are added

GENERAL

up, that overflow does not occur. Figure 5B shows an alternate method of mixing multiple voices. Here, each sample is output to the DAC as soon as it is gotten from the table. The mixing actually takes place in the DAC's low-pass filter. For this to work properly, the "dwell time" of each voice's sample in the DAC should be approximately equal; if they are unequal, the voice dwelling longer will sound louder. One advantage of the 5B method is that the table entries do not need to be scaled (the result is less noise) and one disadvantage is that the loop is slower due to the 3 extra STA instructions.

Figure 5A. Four Voice Waveform Table Scan with Mixing by Addition

```
LDY #0          INITIALIZE Y
LOOP LDA WVTAB1,Y GET VOICE 1 WAVEFORM TABLE ENTRY
CLC
ADC WVTAB2,Y    ADD IN VOICE 2
ADC WVTAB2,Y    ADD IN VOICE 3
ADC WVTAB2,Y    ADD IN VOICE 4
STA DAC        STORE THE SUM IN THE DAC
INY            MOVE THE WAVEFORM TABLE POINTER
JMP LOOP       CONTINUE SCANNING FOR EVER
```

Figure 5B. Four Voice Waveform Table Scan with Time Division Mixing

```
LDY #0          INITIALIZE Y
LOOP LDA WVTAB1,Y GET VOICE 1 WAVEFORM TABLE ENTRY
NOP            EQUALIZE DWELL TIME AMONG THE VOICES

STA DAC        OUTPUT VOICE 1 TO THE DAC
LDY WVTAB2,Y   GET VOICE 2
NOP            EQUALIZE
STA DAC        OUTPUT VOICE 2 TO THE DAC
LDY WVTAB3,Y   GET VOICE 3
NOP            EQUALIZE
STA DAC        OUTPUT VOICE 3 TO THE DAC
LDY WVTAB4,Y   GET VOICE 4
INY            MOVE THE WAVEFORM TABLE POINTER
STA DAC        OUTPUT VOICE 4 TO THE DAC
JMP LOOP       CONTINUE SCANNING FOR EVER
```

Now that waveforms can be output at adequate speed (the figure 5 routines are actually faster than necessary), the next problem is to control the pitch of the tones. Since the pitch is determined by how rapidly the table pointers go around the tables, there are two obvious ways to alter the pitch: change the loop speed by inserting NOPs or change the table length. The former is undesirable for a number of reasons, particularly for multiple voices, so varying the table length will be used instead. The effective table length is actually determined by two factors. One factor is the actual length which so far has been 256 bytes. It is highly desirable to retain this length because it greatly simplifies (that means speeds up) the table lookup

and handling of wraparound. The other factor is how far the pointer advances each sample period. The figure 5 routines always advanced the pointer by 1 but if they are rewritten to advance it by 2 instead, the effective table length becomes 128 entries. If it is advanced by 3, the effective length becomes $85 \frac{1}{3}$ (no problem) and so on. The amount the pointer is advanced in each sample period will be called the table pointer increment. Figure 6A shows the Figure 4 routine modified for a variable increment.

When the table pointer increment is restricted to integer values, only a few different pitches are available for a given table length. For example, the Figure 6A routine can produce only the following frequencies (1MHz clock assumed): 195.3Hz, 390.6, 585.9, 781.2, $N*195.3\text{Hz}$ where N is the increment. Besides being very far apart (the first two are 12 notes apart!), few of the possibilities fall very close to standard music note frequencies. The solution to this dilemma is to allow non-integer table pointer increments. With non-integer increments, any frequency desired may be produced. Their use also implies that the table pointer itself will have a fractional part which calls for interpolation between adjacent waveform table entries. Unfortunately, to actually perform linear interpolation requires a substantial amount of extra code and one (ugh) multiplication to be performed. While the newer 16 bit processors may be able to do this rapidly enough, it is necessary to just ignore the fractional part of the table pointer when wavetable lookup is actually performed on an 8 bit micro. Note that this compromise does introduce some excess noise which is called interpolation noise.

Figure 6B shows a waveform table scan routine modified for non-integer table pointers and increments. Both the pointer and the increment are now 16 bit values with an 8 bit integer part and an 8 bit fractional part. Note that, although the fractional part of the pointer (PTRF) does not participate in the lookup operation, it must be maintained in the calculation for things to work out right. With this routine, frequencies at any multiple of .526Hz may be produced which allows a very close approximation to standard note frequencies.

GENERAL

Figure 6A. Single Voice Waveform Table with Variable Increment

```

LDY #0      INITIALIZE THE POINTER
LOOP LDA WVTAB1,Y GET A WAVEFORM TABLE ENTRY
  STA DAC   STORE IT IN THE DAC
  TYA      ADD THE INCREMENT TO THE POINTER
  CLC
  ADC INCR
  TAY
  JMP LOOP  CONTINUE SCANNING FOREVER
  
```

Figure 6B. Single Voice Waveform Table Scan with Fractional Increment

```

LDY #0      INITIALIZE THE POINTER
STY PTRF
LOOP LDA WVTAB1, Y GET A WAVEFORM TABLE ENTRY
  STA DAC   STORE IT IN THE DAC
  LDA PTRF  ADD THE INCREMENT TO THE POINTER,
  CLC      FRACTIONAL PARTS FIRST
  ADC INCF
  STY PTRF
  TYA
  ADC INCI
  TAY
  JMP LOOP  CONTINUE SCANNING FOREVER
  
```

Figure 7 shows the full-blown, 4 voice synthesis loop that is actually used in existing DAC synthesis programs with perhaps minor modifications. Note that the 4 waveform table pointers (one for each voice) are now kept in memory instead of the Y register (they are all different since the 4 voices will probably have different frequencies) and that indirect addressing through these pointers is used to do the table lookup. Each pointer actually consists of 3 bytes: a constant part that holds the page address of the waveform table, an integer part that points to a particular byte in the table, and a fractional part that is not used for lookup but does participate when the increment is added. Each increment consists of 2 bytes: an integer part and a fractional part according to the pitch desired for the corresponding voice.

Also note that, unlike previous routines, there is provision for the tone generation to stop after a specified number of sample periods. This number is effectively the product of the 8 bit values TEMPO and DUR. In a music program, TEMPO normally remains constant or is changed occasionally while DUR is set according to the desired duration of the 4 voice chord. Note the time equalizing instructions at the end of the loop to prevent sample period jitter when TEMPO is decremented to zero and must be reloaded. Also note that CLC instructions are omitted prior to adding the increments to the pointers. Besides saving 8 microseconds, this action introduces a

slight frequency error which livens up the sound significantly.

Figure 7. Complete 4 Voice Sound Generation Routine

```

PLAY LDY #0      ; SET Y TO ZERO FOR STRAIGHT INDIRECT
      LDX TEMPO  ; SET X TO TEMPO COUNT
      ; COMPUTE AND OUTPUT A COMPOSITE SAMPLE

PLAY1 CLC        ; CLEAR CARRY
      LDA (V1PT+1),Y ; ADD UP 4 VOICE SAMPLES
      ADC (V2PT+1),Y ; USING INDIRECT ADDRESSING THROUGH VOICE
      ADC (V3PT+1),Y ; POINTERS INTO WAVEFORM TABLES
      ADC (V4PT+1),Y ; STRAIGHT INDIRECT WHEN Y INDEX =0
      STA X'1700    ; SEND SUM TO DIGITAL-TO-ANALOG CONVERTER
      LDA V1PT      ; ADD INCREMENTS TO POINTERS FOR
      ADC V1IN      ; THE 4 VOICES
      STA V1PT      ; FIRST FRACTIONAL PART
      LDA V1PT+1
      ADC V1IN+1
      STA V1PT+1    ; THEN INTEGER PART
      LDA V2PT      ; VOICE 2
      ADC V2IN
      STA V2PT
      LDA V2PT+1
      ADC V2IN+1
      STA V2PT+1
      LDA V3PT      ; VOICE 3
      ADC V3IN
      STA V3PT
      LDA V3PT+1
      ADC V3IN+1
      STA V3PT+1
      LDA V4PT      ; VOICE 4
      ADC V4IN
      STA V4PT
      LDA V4PT+1
      ADC V4IN+1
      STA V4PT+1
      DEX          ; DECREMENT & CHECK TEMPO COUNT
      BNE TIMWAS   ; BRANCH TO TIME WASTE IF NOT RUN OUT
      DEC DUR      ; DECREMENT & CHECK DURATION COUNTER
      BEQ ENDNOT   ; JUMP OUT IF END OF NOTE
      LDX TEMPO    ; RESTORE TEMPO COUNT
      BNE PLAY1    ; CONTINUE PLAYING
      BNE *+2      ; 3 WASTE 12 STATES
      BNE *+2      ; 3
      BNE *+2      ; 3
      BNE PLAY1    ; 3 CONTINUE PLAYING
      ENDNOT      ; RETURN
      RTS          ; TOTAL LOOP TIME =114 STATES =8770 HZ

      ; THE FOLLOWING VARIABLES SHOULD BE IN PAGE ZERO
V1PT .BYTE 0      ; VOICE 1 WAVE POINTER, FRACTIONAL PART
      .WORD WAV1TB ; INTEGER PART AND WAVE TABLE BASE
V2PT .BYTE 0      ; VOICE 2
      .WORD WAV2TB
V3PT .BYTE 0      ; VOICE 3
      .WORD WAV3TB
V4PT .BYTE 0      ; VOICE 4
      .WORD WAV4TB

V1IN .WORD 0      ; VOICE 1 INCREMENT (FREQUENCY PARAMETER)
V2IN .WORD 0      ; VOICE 2
V3IN .WORD 0      ; VOICE 3
V4IN .WORD 0      ; VOICE 4

DUR: .BYTE 0      ; DURATION COUNTER
TEMPO .WORD 82    ; TEMPO CONTROL VALUE, TYPICAL VALUE FOR
      ; 3:4 TIME, 100 BEATS PER MINUTE, DUR=64
      ; DESIGNATES A QUARTER NOTE
  
```

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('c*/ %*//' hangs up; '*c/ %*//' does nothing, but '*c*/ %*//' removes all spaces from left.)

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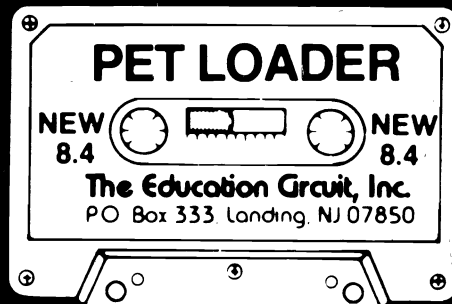
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DEALER INQUIRIES WELCOME.

Re-inking Printer Ribbons

by J. Bos

Brantford, Ont.

Printers such as the 8023p and others do use ribbons that are contained in a cartridge.

The printed letters become gradually less dark until a point is reached where it becomes necessary to replace the ribbon.

The cartridges are fairly expensive, so I will describe the steps required to re-ink the ribbon:

1. Remove the cartridge from the printer.
2. Select a screw driver with a blade width equal to width of the horizontal slots in the vertical sides of the cartridge body.
3. Insert screw driver blade into one of the five slots and twist blade to pry up the cover approximately 1mm (about 0.04 inch).
4. Repeat step 3 for the other four slots.
5. Position screw driver or knife blade on one side under the cover between slot and 'nose' and gently slide it towards the 'nose' of the cartridge.
6. Repeat step 5 for the other side.
7. Goto step 3 if cover is not loose.
8. Do not remove or disturb the ribbon.
9. If you ignore step 8 you'll be sorry.
10. Apply with a little brush a few drops of the re-inking fluid. As a guide you may try about five drops, you can always add more if needed.
11. Make sure that the ribbon is still down

in its original position, especially along the edges, so that the cover can not pinch it.

12. Reassemble the cover on the cartridge body all the way back down to its original position.
13. Inspect the aluminum coloured mask. If it is badly worn you may attach over top of it a new layer of thin metal or plastic tape that has a pre-cut hole in it to clear the needles of the print head. The thickness of the tape may reduce the number of copies that your printer can handle.
14. Reassemble the cartridge in the printer and turn the knob on the top in the direction of the arrow to take up slack of the ribbon.

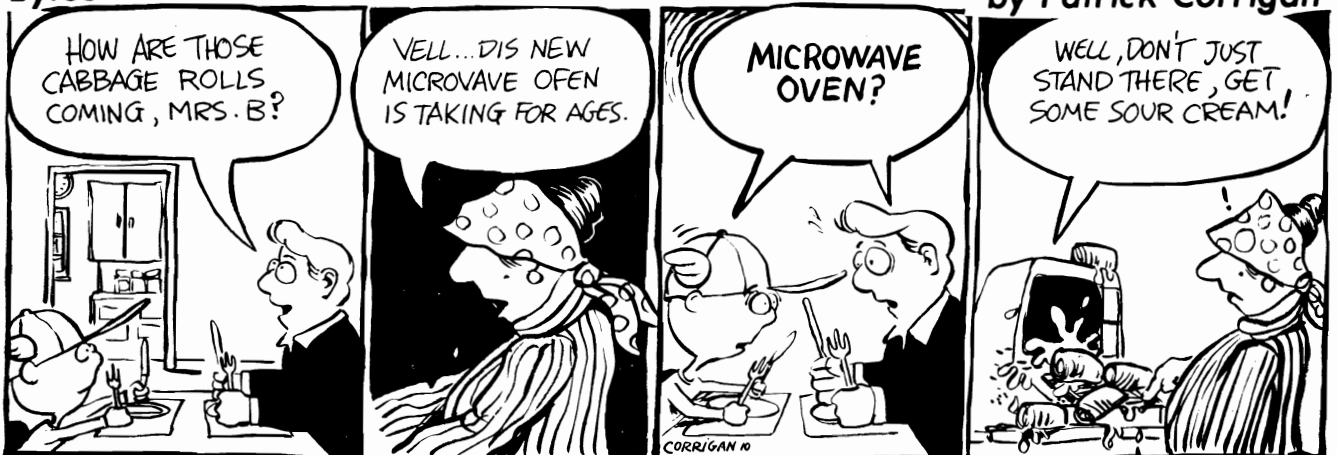
Best results are obtained when the ink has a few hours time to spread evenly through the ribbon.

The re-inking can be repeated several times.

I made the medium for re-inking by first concentrating the contents of a bottle of black stamp pad ink over slow heat to half its original volume. Then I added glycerine to restore the original volume.

(I heated the stamp pad ink in a metal cap of a spray can on a wire stand over a candle.)

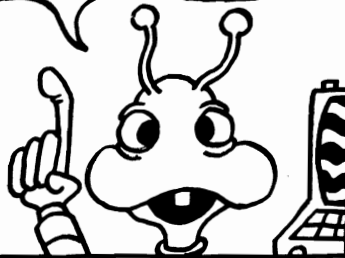
Bytes



by Patrick Corrigan

CURSOR CONTROLS WITH CHIPP!

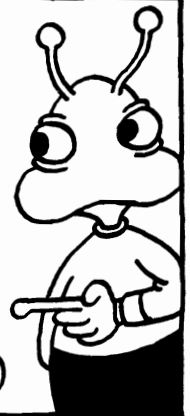
FIRST OF ALL, LET ME SHOW YOU WHAT THE CURSOR BUTTONS LOOK LIKE...



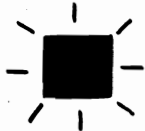
(UP-DOWN)



(LEFT-RIGHT)



THE CURSOR IS THE FLASHING BLACK DOT ON YOUR SCREEN.



THE CONTROLS MOVE IT AROUND THE SCREEN.



PRESS THIS BUTTON AND SEE WHAT HAPPENS :



ZOOM



THE CURSOR SHOULD MOVE TO THE RIGHT.

MIKE RICHARDSON

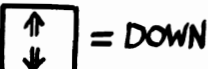
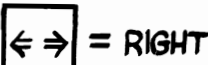
TO BRING IT BACK, PRESS



THE CURSOR SHOULD MOVE TO THE LEFT.



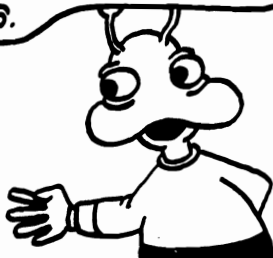
HERE ARE THE BUTTONS FOR ALL FOUR DIRECTIONS



BY MOVING THE CURSOR AROUND, YOU CAN EDIT MISTAKES IN PROGRAMS QUITE EASILY. IT'S A VERY USEFUL TOOL.



THE CRSR BUTTONS CAN BE USED IN PRINT STATEMENTS AS WELL TO MOVE AROUND CHARACTERS.



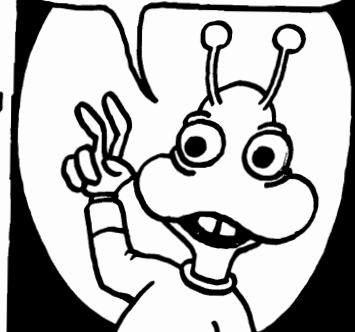
TRY THIS PROGRAM ↘

5?" "

10?" *"

EXPERIMENT WITH DIFFERENT CURSOR CONTROLS.

SEE YA NEXT TIME!



COMMODORE-64

C-64 Link by Todd Hamilton Highland, MI

The Commodore 64 Computer is not designed to communicate to IEEE-488 devices. Peripherals such as the 4040 disk drive and 4022 printer normally used on PETs will not connect to the C-64.

RTC of Canada markets the C-64 link to interface between the C-64 computer and either parallel, serial or IEEE devices.

After four months of use, my conclusion is that the C-64 Link is a very fine product. My hardware-test experience includes a C-64 Computer, C-64 Link, 1541 Disk Drive (serial), and a CBM 2022 Printer (IEEE). To date, no parallel devices have been used.

The C64-Link switches modes with immediate keyboard commands, "IEEE(CR)", "SERIAL (CR)", or "PARALLEL (CR)". The C64-LINK also will switch with software commands, "POKE 820,3", "POKE 820,2", or "POKE 820,6". The C64-Link allows the user many of the BASIC 4.0 commands. However, only the BASIC 4.0 commands understood by your peripheral will work, i.e. back-up will not work with the 1541 disk drive. The C64-Link allows the user to call the on-board monitor, "MONITOR", at any time and to return "X" to BASIC. It also has "Modem" software, but mine is yet to be exercised.

After two and one-half months of operation, the C64-Link failed to communicate to the IEEE printer with "? device not present error". The link was mailed back to RTC for repair. The C64-Link was returned 10 days later, repaired and ready to go. The service was excellent.

After a total four months of service, the C64-Link met my objectives of being able to communicate with a IEEE printer and offered useful new features. However, there is room for improvement. The documentation that comes with the C64-Link is only adequate. It lacks detail in the BASIC 4.0 commands and I/O capabilities of the C64-Link itself. It is not clear which BASIC 4.0

commands will work, and lacks detailed examples for 1541 users with one or two units. The information on software switching of the I/O devices is included in the manual, but little reference is made to it and NO examples are included. The monitor is a definite plus, but it is a very elementary monitor. More capability added to the monitor would make it a very powerful tool.

The C64-Link comes with software to relocate its code to prevent interference with BASIC etc. However, some machine language programs interfere with C64-Link software anyway. The end result is many removals and reinstallations of the C64-Link.

Enhancement of the C64-Link could be provided with switch selectable options:

1. Code location (change memory blocks used)
2. Primary device (presently power-on in IEEE. Serial 1541 requires pressing the C=key on power-up)
3. Disable the C64-Link without removing it
4. Reset the computer. This would allow moving the codes, disabling the link, etc.

The operation of the link could also be improved with a device "not ready response". Presently, if a command is sent to a IEEE device (the printer) and that device is off, the program locks up with the screen blank or appears to transmit data, but nothing happens. A gentle reminder device "not ready or present" and a return to the ready mode would be a help.

The C-64 is a fine product and if you are thinking of borrowing mine, you can forget it. I use it every day!

Worlds Worse Computer Puns by John Ylimaki

Hacking can be frustrating at times...
It's one RAM thing after another.

Glasses are not recommended for PET users.
They cause division.

Byteds

by Bill Yee

Winnipeg, Manitoba

BYTEDS is a compact little utility, written in BASIC, that allows VIC-20 and C-64 users to freely access and save any part of memory. As a tool for managing hexadecimal data entry and storage, its data saving capability has the possibility for misuse. My intentions for this utility are to allow users to achieve a better understanding of their VIC-20 or C-64 systems and also to allow them to explore the world of hexadecimal data bytes and machine language coding. I believe its value in these areas far outweighs any possible misuse. In the VIC-20, the system routines deter misuse by preventing tape saves of memory areas at \$8000 and higher.

The utility is loaded and run like any other BASIC program. It has two main sections - the hexadecimal data editor and the memory image saver. The editor is always entered first to allow the user to view and modify data bytes in memory. Upon completion of editing, the editor is exited to invoke the saver section. The saver section allows the user to save memory to either disk or tape. Addresses for memory locations are inputted in either decimal or, if prefixed with \$ sign, is interpreted as hexadecimal.

The editor displays the address of the current memory location being edited as a 4 digit hexadecimal number. The contents of the location are shown on the same line as a 2 digit hexadecimal number immediately after the address. To enter a new data byte into the displayed location, key in any 2 digit hexadecimal number. Only digits from 0 through 9 and alpha characters A through F are accepted. If a mistake is made, continue input as only the last two characters are used in writing the new data byte to memory.

After keying in a new data byte, memory write is done by hitting either RETURN, SPACE bar, or the UP/DOWN CRSR key. If memory is successfully written, the current location address is incremented except for the UP CRSR which

causes the address to decrement after write. If the location cannot be written, the address remains constant and the contents are redisplayed followed with the message "R/O".

If no new data is keyed in, the location address is incremented or decremented by respectively keying the DOWN or UP CRSR. The SPACE bar redisplayes the same location and data on the same line. This provides a monitoring capability for hardware registers such as timers and ports. Hitting RETURN results in a new request for an edit location address. If no address is inputted, another RETURN ends the editor and starts the memory image save section of BYTEDS.

BYTEDS prompts the user if memory save is desired. A reply of "N" for No ends BYTEDS. A reply of "Y" for Yes causes prompts for start and end addresses for the memory area to be saved. Address values are decimal unless prefixed with the \$ sign to indicate hexadecimal. Prompts are then made for device (Disk or Tape) and a mandatory file name. The save is then done.

The data on disk or tape can be reloaded into memory from where it was originally saved by using the non-relocatable form of the load command in the BASIC environment.

For disk: LOAD "file name" , 8 , 1
For tape: LOAD "file name" , 1 , 1

The load will disturb the BASIC memory pointers so a NEW is needed to reset the pointers. If the reloaded data is to be modified and re-saved, BYTEDS would be reloaded after reset of the pointers.

BYTEDS is a utility that I suspect most users will want to keep handy after they have tried it a few times. It should prove useful even after more sophisticated tools such as a monitor or an assembler package is acquired.

Easy VIC Reset

by Victor Chan

Toronto, Ont.

After reading an article from a major computer magazine saying that, in order to implement a reset switch for the VIC, it is necessary to remove the main board, solder wires to one IC chip and drill a hole in the plastic case. Trying to save possibly hundreds or thousands of VIC's from getting burned and cracked, I decided to investigate an easy VIC reset.

On the VIC user I/O port (left most port from the same port), pin 3 is RES, which, when being grounded, will reinitialize the computer as if it has just been turned on. To ground this pin I took a standard 12 pin edge connector and wired pin 3 to pin N. Key the connector into the user I/O port and then remove it. The computer is then reset and the power up message "COMMODORE BASIC v 2.0" appears on the screen. I took a further step to investigate the contents of the BASIC memory and found that all memory contents are unchanged except the link address of the first statement (first two bytes of BASIC memory), and the end of BASIC pointers (memory locations 45 and 46) has been cleared to zero.

In order to restore these values, one will have to know the address of the beginning of the second BASIC statement and the end of the BASIC program. These values cannot be easily obtained especially when you do not have a machine language monitor built in as that on the PET.

A simple preparation for easy restore of the first statement link address is to always keep the first BASIC statement as:

```
O REM
```

Then the link address is always the same, and can be restored by executing the following sequence of commands in immediate mode:

```
A=PEEK(44): POKE A*256+1,7:
POKE A*256+2,A
```

After executing this statement you will find that you can list your program, but do not edit or run it, as the computer still does not know the locations of the end of your

program. To restore the end pointer is not a simple task, or at least, will require the use of machine language. I will not discuss about restoring the end pointers but will discuss a method to save and load the whole BASIC program by means of ASCII tape files. To save your BASIC program as an ASCII file execute the following sequence of commands in immediate mode:

```
OPEN 1,1,1,"program name":CMD 1:LIST
The computer will respond with a normal
save procedure and lists the program to
tape, when the cursor becomes visible
again, execute in immediate mode the following:
```

```
PRINT$1:CLOSE 1
```

You have now saved on tape the whole BASIC program in ASCII. In order to load it back to the VIC, rewind the tape and execute the following:

```
OPEN 1
```

The computer will respond with the normal load procedures, when this finishes, leave the tape with play button down, clear the screen and use cursor down to move the cursor to the fourth row on the VIC screen, type in and execute the following statement:

```
POKE 153,1: POKE 198,1
POKE 631,13: PRINT "(HOME)"
```

Press return after typing in the commands, the tape will start moving again, and the cursor will come back in approximately five seconds. Once again use the cursor control to move the cursor to the beginning of the above statement and press return. When the loading is completed the message ?SYNTAX or ? OUT OF DATA will be printed on screen. Type in and execute the following statement:

```
CLOSE 1
```

The program has now successfully been loaded on memory and is ready for run or edit.

One last point, the ASCII load and save presented here does not have to be used after reset. In fact, it is a convenient way to append and merge BASIC programs.

Software Review

VIC Editype and Four Programs for Expanded VIC

by **Richard Best**

Mississauga, Ont.

COMPUTE magazine always seems to have a lot that is of interest to a Commodore owner. The April 1983 issue (Issue 35, Vol. 5, No.4), in particular, has a number of very interesting programs that are a welcome addition to a VIC library. The most exciting and useful of these is perhaps the VIC EDITYPE word processor submitted by Paul Bishop. I have now had the program running for several weeks and have found it to be if not the ideal utility, at least a relief from the usual routine of pen and paper or, worse, typewriter and paper. I have submitted a copy to the TPUG library and, for those of you who do not have the relevant issue of COMPUTE, here are a few highlights.

The main menu gives the options of NEW text, CONTINUE new text, SAVE new text, LOAD from tape, PRINT, EDIT, and LOAD AND PRINT all in one step. The program assumes that you will be using a printer (I don't have one either) but you can easily do the composition part on the processor and simply type from the screen on a regular typewriter. This alone, makes a word processor worthwhile, since a typed page cannot be edited at all. When you select the NEW mode, you are asked to give your text a title. This title will be used to store the file. In this mode you can type about one page of text on an 8K VIC. A "MEMORY LOW" warning is provided, but, as Mr. Bishop suggests, you may want to SAVE to tape when the screen editor gets sluggish. In this way, you can write a longer piece by entering one page at a time and storing a series of files. As the memory begins to fill, the cursor has a tendency to misbehave and miss the occasional letter. The program features a wrap-around that will not split any words in two. It can

sometimes be disturbing to watch a word disappear and show up on the next line. When this happens, it is also possible to miss a letter, especially when the memory is very full. Incidentally, all keys repeat except for the cursor keys which are disabled.

Once you have created your masterpiece, if you are like most computerists, there will be a plethora of typing errors. These are handled by the program's EDIT mode. Since EDITYPE is a line editor, it is not possible to add or delete large portions of text easily but if you have made a major catastrophe of your work and must start over, then you will only have to redo one page. Editing is fairly straightforward. Once you have selected the EDIT mode, you are given a minimenu of four options: "F" will advance the text one line at a time, "C" will stop the text for correction, "*" enters the correction and "↵" returns you to the main menu. To edit a line you must retype the line exactly as it appears in the text, press "↑" to enter the wrong version, then type in the correction and press "↑" again to enter the correction. Editing will take a bit of time, especially if you have a lot of text. If the error is not found, the editor simply picks up where it left off. This means that you must have your composition fairly well organized before you begin typing. You may edit at any time and return to the text by selecting the CONTINUE mode.

There is a trick that will help with major editing problems. Stop the program and change the offending line in DIRECT mode. Text is stored as the variable A\$(N) (N=1to200). When you stop the program, you can "PRINT A\$(N)" until you find the problem area. Then enter A\$(N)="(correct version)". Now, to get back into the

VIC

program

WITHOUT DESTROYING YOUR TEXT, enter "GOTO 51". This will bring you to the main menu with text intact. If you type RUN, the VIC will erase all of your work. As noted above, if you have a lot to say, then you can store your article one page at a time and recall it from tape as you need it. This article was written in four parts and stored on a single C10 cassette. Unfortunately, while it is possible to edit text that has been **SAVED** and **LOADed**, it is not possible to **CONTINUE**. This mode works only in conjunction with the **NEW** mode.

The remaining commands are for your files and the printer. **PRINT** will print your text on a printer. You will be asked to select line length (up to 80 characters), indented line length (specify which lines to indent by prefacing the line with "["), Single or Double spacing, and line numbering. There is also an auto-centering feature invoked by starting a line with "^". **LOAD AND PRINT** will retrieve a file from tape and send it directly to the printer. This function allows you to work with longer text.

Due to the way that the screen editor works, there is a slight tendency to crash. For instance, if you **DELeTe** past the start of a line, you will get an "ILLEGAL QUANTITY" error and a crash. Simply type "GOTO51" to get back into the program.

Although **EDITYPE** is a relatively limited word processor, it is easy to use and flexible enough to make it quite useful around the house. There is more than enough power to compose letters and short articles, and also to create files of any sort. With a 3K expander the action is slow but tolerable, and the **SAVE** and **LOAD** functions are quick and easy to use, and increase the processor's over-all capacity. This program is a nice introduction to word processing, and at the price is very hard to beat. It may inspire you to invest in a more sophisticated package but, in the meantime, I hope you enjoy using the **VIC EDITYPE**.

FOUR PROGRAMS FOR EXPANDED VIC

SYNTAX SOFTWARE is a relatively new **CANADIAN** company and, I might add, quite

a good one. The two games I would like to tell you about are their **CYCLONS** and **CRITTERS**, both for expanded VIC and both better than average.

CYCLONS is a space 'shoot-em-up' type game that should win a lot of fans. It can run on either an 8K or a 12K+ VIC. The 8K version operates at the 'advanced' level all the time. With 12K or more, you have four different levels, from beginner to expert.

You are the commander of a yellow ship which bears more than a passing resemblance to a salt shaker. Controlling your ship with a velocity stick, you bounce around deep space in pursuit of deadly spinning **CYCLON** ships. No more than 3 ships will attack at one time, but if you prove a formidable opponent, they will send for a **PULSAR DEATH SHIP**. The **Cyclons** will shoot at you but the **Pulsar** ship will pursue you trying to crash into your ship. The beginner mode is challenging, as is the intermediate mode. Advanced and expert are only for the courageous. In any mode you may choose from four parameters. At the beginner level, you have only the **Cyclons** to deal with. At the expert level, there are three **Cyclons**, two **Pulsar** death ships which match your speed, and a planet surface to crash into.

CYCLONS is a well written and well thought out game. The action is fast and challenging. It is available on cassette and includes well written documentation. This is definitely a four star game.

Also from **SYNTAX** is a game called **CRITTERS**. This one requires at least 12K. My first impression was of a slow **GALAXIANS**, but there are a number of interesting twists to this program. You are the guardian of a pumpkin patch, guarding your crop against pumpkin-stealing **CRITTERS**. The critters look a bit like disembodied rabbits and fly in formation at the top of the screen before swooping down either to knock you down or steal your pumpkins. You are armed with only a pistol and must try to shoot the critters before they turn yellow and go after a pumpkin. The more critters you shoot down, the more will appear the next round.

I did not warm to **CRITTERS**. I found the action quite slow and the idea of the game not that interesting. Still, it is an

VIC

enjoyable game and well executed with the same attention to graphics and documentation as CYCLONS. This is a two and a half star program making it better than average and worth having a look at.

I prepared this article on the **W/P PLUS word processor** from Intelligent Software, written by William Robbins. This is an extremely well done program. It requires 12K or more memory and can be used with or without a printer. It will even work on other Commodore machines. So far I have tried it on a Vic, an original PET, a 4032 and an 8032 CBM. It is programmed to drive a VIC printer but will work on other CBM printers. I used a 4022.

The processor is menu-driven and includes Write, Edit, Display text, Address letter, Print text, File commands, and Quit. The screen does not feature word-wrap in the Write mode, but does in the Display mode. There are five formatting commands to the printer to custom tailor the final output, and it will right justify. Editing is handled much like normal screen editing and to make it a relatively painless procedure, you may enter the edit mode from the display mode. The menu also tells you what line number you are up to in the text. This makes it very easy to find and correct an error. In addition, once you have made a correction, you are allowed to change your mind. Included are insert, Delete and Swap commands which, when mastered, will allow you to do some pretty sophisticated manipulation of text. Files can be stored on either tape or disk.

W/P PLUS is another four star program. It includes good documentation and, since it is written in BASIC, you can change it to fit your own individual needs if necessary. If you do not already own a word processor, you should consider buying one, and if you are shopping around, put this one high on your list.

Creative Computing called **COPYCALC** the world's cheapest **VISICALC**. It is a spreadsheet for a 12K+ VIC, also from Intelligent Software, also by William Robbins. This is a real spreadsheet with many of the features of the original. It is of course limited, but for the price it offers a great deal of performance.

Copycalc comes with changeable

column titles, optional row titles, and the ability to enter rows as functions. For instance, if you want to compute interest, just tell the program to add the appropriate percentage to your initial figure. One row can be entered as a function of another row complete with added constant. The format of the function equation is given at the bottom of the screen when you select the function modes. Once you have entered all your data, press '=' to calculate. In the right-most columns are posted grand totals and averages, and column totals are displayed at the bottom of each column. There is an alternate mode that allows you to enter an additional column as a function of your totals. However, this did not seem to work on my copy. If you decide to go back and change some figures, the spreadsheet will recalculate according to your original parameters.

This is a powerful and versatile program which uses many of the functions most needed in a spreadsheet. It is limited more by the VIC's screen than anything else (it will only display 2 columns at a time). You are only allowed up to 18 rows, but you may have as many columns as you like, dependent only on available memory. The program will also run on other Commodore machines, and it will SAVE or PRINT your calculations. For a mere \$29.95 this is quite a program. Four stars.

CYCLONS (8K/12K VIC) \$22.95

CRITTERS (12K+ VIC) \$22.95

Syntax Software Inc.,

Willowdale Ontario

W/P PLUS (12K+ VIC & C-64) \$39.95

COPYCALC (12K+ VIC & C-64) \$29.95

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Editor's Note: I am not quite sure what Compute's and TPUG's policies are on these matters these days. I think Compute requires copyrights for their programs and requires you to own that copy of Compute before you can use it, and I think TPUG will put into their library only programs that are fully public domain so they will not be able to accept the program.

We are publishing this anyway because we like to tell you about good things wherever they are found.

Editor

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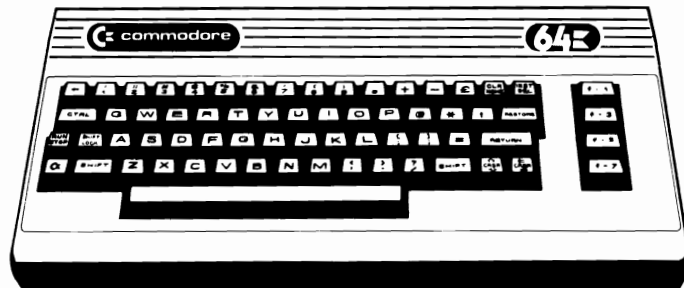
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6502

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Sheridan College is again hosting its popular two day workshop on 6502 Assembly Language programming for the Pet, Apple, and Atari computers. Participants will study the conceptual foundations of machine language programming, learn the most useful commands in the 6502 instruction set, and write working assembly language subroutines and programs. All computer time and manuals are provided for this intensive two day course. The only prerequisite is an elementary knowledge of BASIC programming.

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- I. Machine Language: An Introduction to the Naked Chip
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- III. The 6502 Registers: Barney Does His Boring Job (and Does It Again)
- IV. The 6502 Instruction Set: Tiny Commands For Total Control
- V. Assembling and Disassembling: Putting It Together and Taking It Apart
- VI. First 6502 Programs: Life in the Fast Lane

The instructor for the course is Kem Luther, Ph.D., a teacher in the Computer Studies Program at Sheridan College. In addition to teaching programming at Sheridan, he has several years experience in writing and publishing commercial programs for the major microcomputing systems.

The workshop will be held at the Oakville Campus on September 10-11 1983. The fee is \$150 for the two days (including lunch). Further information may be obtained by calling the Sheridan College School of Computer Studies at 845-9430, 823-9730, or 632-7081, ext. 142.

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String Along With Me!

by Jim Butterfield

Some people are bothered by strings. I don't know why: I tell them that strings are values that you can't perform arithmetic on.

In other words, 27 is a number ... you can add and subtract it "27", on the other hand, is a string. You can print it or put it on a file, but you can't add it to another number. In fact, if you ask the computer, PRINT "27"+"35", the answer will print as 2735 ... it's like the elementary school joke. What happens here is not addition; it's called "concatenation", pronounced with emphasis on the cat.

There are lots of things you want to handle on your computer that are not numbers ... and even numbers that you don't want for arithmetic purposes. For example, if your address is 235 Coxwell, the 235 isn't a number you will want to compute with ... it will be needed only to print on your address label. And if your phone number is 555-1212, you won't expect it to be added to other phone numbers to generate a meaningful total. Then again, maybe I'm wrong ... one of these days, some statistician will announce that the average phone number in Toronto is 513-7809.

Much Ado about Null

Some people are bothered by a special kind of string called a "null" string. This one contains nothing ... no characters, ... nothing. It turns out to be quite useful. If a mailing list wants your middle initial, and you don't have a middle initial, it may end up as a null string - nothing there. You code a null string like this: A\$="" ... since there's nothing between the quotation marks, there's nothing in the string. This isn't the same as a space: A\$=" ". A space is a character. Null is no characters at all.

You can tell the length of a string by using the function LEN(). So LEN("HELLO") is equal to five, and LEN of a null string is equal to zero. But why use a null string, anyway?

Well ... suppose you want to receive characters from the keyboard one at a time, using the GET statement, and string them together, stopping when you GET a carriage return. As you received each character, you'd tack it onto the string you have formed so far, making it one longer. What do you want to start with? No characters at all, of course ... a null string. Let's code that.

```
100 A$="" (start with nothing)
110 GET C$ (get a character)
120 IF C$="" GOTO 110 (nothing, try again)
130 IF C$=CHR$(13) GOTO 200 (RETURN, quit)
140 A$=A$+C$ (add the new character)
150 GOTO 110 (try for more)
200 ...
```

By the way, we use the null string in line 100, but we also check for a null string in line 120 ... if no key has been pressed, we'll GET nothing ... the good old null string.

Changing to a Numeric

There are two ways you can change a string into a number. The first, VAL, gives you the value of the whole string, if it can, so that VAL("235") is the number 235. The second, ASC, gives you the character number of the first character only, so that ASC("235") gives you 50, the code for character "2".

If you try to take the value of a non-numeric string, you'll get zero ... if the string is partly numeric,

you'll get the value up to the first alphabetic. So PRINT VAL("20 MAY 1936") will give you 20, and PRINT VAL("FIFTY-FIVE") will yield zero.

ASC is very useful, when you get used to it. It classifies not only the alphanumeric characters, but the non-printable ones, too. If you'd like to see the character identity of the cursor-down key, type PRINT(" ... now press the cursor-down, which shows up as reverse-Q ...") and you'll get the value. Very handy for classifying keystrokes, among other things.

Making a String out of a Number.

It's often useful to change numerics into strings. There are, again, two ways to do this. The first, STR\$, changes the value into a string of characters, so that STR\$(235) will produce the string, " 235". The second, CHR\$, changes a number from 0 to 255 into a single ASCII character.

If we type X\$=STR\$(56), the resulting string X\$ will have length three, not two ... the first character will be a space. More accurately, it represents the sign of the number: space for positive, minus for negative. By the way, there's a small difference between PRINT 55;"COWS" and PRINT STR\$(55);"COWS". When you print a numeric, it will be followed by a cursor right; when you print a string, it will have no extra characters following. So: the second example will have no space between the last digit of 55 and the first letter of COWS.

We can print any character in the book with PRINT CHR\$(.), even characters that don't print, like screen clear or cursor movements. One character is very hard to print in the conventional way: the quotation marks. You can't command PRINT """"; that just gives you a syntax error. But PRINT CHR\$(34) does indeed print that elusive character.

Changing strings.

We can make strings smaller by cutting them down to size with: LEFT\$, which picks off a selected number of characters from the left; or RIGHT\$, which picks them from the right; or MID\$, which picks them off starting from a selected place in the middle.

There are two kinds of MID\$, by the way. PRINT MID\$("BUTTERFIELD",7) will print starting at the seventh character to the end. With two numbers, PRINT MID\$("BUTTERFIELD",2,5) will print starting at the second character, but will print only five characters.

We make strings longer by concatenating them, of course. We've already seen that an expression such as "HOT"+"HOUSE" results in the string HOTHOUSE.

If we combine the two techniques, making things both shorter and bigger, we can rearrange or rebuild a string as we wish.

```
X$="BUTTERFIELD": PRINT RIGHT$(X$,5)+LEFT$(X$,6)
reworks things very easily.
```

Why Strings?

It's useful to know that everything that Basic inputs and outputs - from keyboard, tape or disk, and to screen, tape, disk or printer - everything happens as a stream of characters. If you programmed PRINT 8+9 you would actually send to the screen: space, 1, 7, cursor right, return. Characters.

So ... if you want to exercise ultimate control over input and output, you'll make up the strings yourself and deal with each character.

Next time you're feeling strung out on input/output coding ... get with it, and string along.

More About Fuzzy Numbers

by R. Richard Amari

Abingdon, Va

In the January, 1983 issue of the TORPET, an article appeared entitled A PET PEEVE, Fuzzy Number by John Ylimaki. John provided great insight on the problems of performing arithmetic calculations with precision. If you were not able to read that article, suffice it to say results of simple calculations may not always be as expected. Using John's example, subtract 3 from 3.1 and display the results. Obtaining string values can also cause unpredictable results. Try displaying the string value of 64.29.

This problem may never be more dramatic than when it occurs in a financial application. Imagine producing your first income statement for a client. Here it comes, hot off the printer and into his hands showing a net profit of \$1,223.2300001 for the month. Not very impressive! (The report not the profit). John gives two methods for performing calculations to keep precision. One is to do all arithmetic in BCD. That means programming in machine language so let's look at the solution in BASIC. Second, it is suggested to round numbers before printing and if possible do all calculations in integer as this problem only occurs with floating point variables. It probably is not feasible to do all calculations in integer (or cents) as the largest dollar figure which would be able to be obtained in terms of cents would be \$327.67. This is due to the constraint which specifies integer constants can range from -32768 to 32767. By rounding only before you print, you risk the chance of allowing fields to be represented in exponential form prior to printing. Your report may now come up with a net profit of 122.323E3

I have found the easiest and safest way to assure that all numbers keep to two decimal positions at all times is to run them through the following routine after each calculation. I keep the routine at the top of the program for performance reasons as it may be executed many times in a program. It will indeed affect the run time of the program if it is executed

repeatedly, however to an end user, a good looking report is worth the wait. Besides, it takes far longer to explain why the net profit is \$1,223.2300001 than it does to let the program correct it.

```

1 *****
2 Make Cents Routine- N5 contains result
3 of arithmetic calculation. Field rounded
4 to two decimals is returned in N5$.
5 *****
6 IF N5<0 THEN N5=N5-.005
7 IF N5>0 THEN N5=N5+.005
8 N5$=STR$(N5)
9 L%=LEN(N5$)
10 FOR H =1TOL%
11 P$=MID$(N5$,H,1)
12 IF P$="."THEN14
13 NEXT
14 IF H<(L%-2)THEN16
15 GOTO17
16 N5$=LEFT$(N5$, (H+2))
17 RETURN
    
```

CHAPUT!



WHEN THEY DEVELOPE A PERIPHERAL THAT WILL MOW THE LAWN OR EMPTY THE GARBAGE, THEN I'LL GET EXCITED ABOUT COMPUTING.

Scopy 5.0 Instructions

by Keith Peterson

XA-TPUG BEST MISC.P
(PTS)

Scopy is a file transfer system, capable of transferring program, sequential, or relative files between disk drives and/or devices. File selection is done by listing the directory using Scopy commands, then selecting the programs to be included from the directory listing.

You may also send specific commands to either drive, such as a new command, or a uj (reset)

Scopy offers a considerable number of options in its file transfer setup, including replace, copy to new name, scratch, wild card copy, and renames. All commands are stored in a queue, and may be viewed at any time. Queue entries may be removed if desired.

Here is a list of command options, and a short description of their effect:

- @ prefix for directory of 'from' drive/device
 - @ standard directory
 - @0 (@1) directory of drive 0 of 'from' device
 - @0:xx* wild card directory (wild card may be in quotes)
 - @0 "xx" specific directory looking for file 'xx' (demonstrating quotes)

- ? prefix for directory of 'to' drive/device
 - ? standard directory
 - ?0 (?1) directory of drive 0 of 'to' device

All following commands operate on file names in quotes on the current cursor line.

- return Copy file on current line
- c Copy file to new name
- o 'On' : Replace a file
- c0 (c1) copy to new name within drive 0 of 'to' drive
- r0 (r1) rename file to new name on drive 0 of 'to' device
- s0 (s1) Scratch file

Scopy Directives

- | | |
|------------|---|
| left arrow | clear queue |
| - | remove entries from queue |
| up arrow | execute queue |
| fre | toggle bytes free display |
| slow (slo) | select 'slow' transfer method (may be required on non-standard devices) |
| fast (fas) | select fast transfer method (default) |
| gar | force a garbage collection |
| m | modify a drive device number |
| d | change from and to drive and device numbers |
| v | view queue |
| run | restart program |

Specific Operation Instructions

DIRECTORIES

This is a directory-based program in that all operations are designed to be done directly off a directory listing. Thus the directory commands are designed to allow either specific or general directory searches.

All directories may be paused with a space bar or terminated with a return. After a directory is terminated, it may be continued by scrolling the screen with cursor down. Directories that have scrolled off the top of the screen may be viewed by scrolling screen down with a cursor up. Items operated on will show that operation when scrolled.

All directory commands are prefixed by either an @ or a ?. An @ specifies that the directory is being requested of the 'from' device, a ? that the 'to' device should be accessed. These examples will show only the @ prefix.

Directories may be complete directories, specific directories, or wild card directories:

@ prints complete directory of 'from' drive and device

@0:xxx or @0: "xxx" prints a directory including only the file 'xxx', if it exists.

@0:x?* or @0: "x?*" prints a directory including only the files that fit the 'wild

card', that is, a pattern match is done on the file name where any character fits a ? and anything beyond an * is ignored.

COPIES

A file that you wish to copy from the 'from' disk/device to the 'to' disk/device without changing the name may be added to the queue by simply moving the cursor to the line containing that file name (in quotes or not) and touching return.

This operation will accept a wild card input. For example, a return on a line containing "code*" will put a separate copy command into the queue for each file starting with the first four characters 'code' currently on the disk in the 'from' disk/device.

c "xxx" will read the file name on the line, then prompt for a destination file name with the prompt 'to?'. At this time you may either modify the existing file name or move the cursor to a file name on another line and touch return. A command to copy a file by the first name on the 'from' disk/device to the second name on the 'to' disk/device will be entered into the command queue.

o "xxx" will read the file name on the line, then prompt for the name of a file to replace on the 'from' disk/device with the prompt 'On?'. You may just touch return or modify the file name and touch return, or move to a different line and touch return to input the second file name. Two entries will be made in the command queue: first a scratch command to remove a file by the second name from the 'to' disk/device, then a copy command to complete the transfer.

c1 "xxx" This command is for copying a file on the destination device to a different name on the same drive. It will read the file name on the line, then prompt for a destination file name with the prompt 'to?'. At this time you may either modify the existing file name or move the cursor to a file name on another line and touch return. A command to copy a file by the first name to a file by the second name on the 'to' disk/device will be entered into the command queue.

r1 "xxx" This command is for renaming a file on the destination device to a different name. It will read the file name on the

line, then prompt for the new file name with the prompt 'to?'. At this time you may either modify the existing file name or move the cursor to a file name on another line and touch return. A command to rename a file by the first name to the second name on the 'to' disk/device will be entered into the command queue.

s0 "xxx" This command is for scratching a file on the destination device. It will read the file name on the line and enter a command to scratch the file into the command queue. Wild card entries are allowed, so be careful.

Other Commands

The other commands follow similar syntax, and need not be embellished further. In all cases, file names are entered in quotes, and are taken from the current cursor line. Various prompts are used where appropriate.

Scopy Directives

Several commands exist to facilitate both the actual copying process and the queue building process.

- m** Prompts for old device number and new device number. Soft-changes device number of a drive on the old device number to the new device number.
- d** Allows you to change the 'from' disk/device and 'to' disk/device. Puts you back through the boot-up drive/device questions, with defaults set to the current disks/devices. Thus a 'd' and four returns allows you to check your setup disk/device numbers.
- v** View queue. All operations requested will be displayed. Operations will show drive number, but not device number. Thus copies destined to be copied between drive0/device 8 and drive0/device 9 will show as c0:name=0:name. Direct commands to the 'to' or 'from' devices will show a reverse field t or f.

left
arrow

Prompts with a 'Clear-are-you sure?'. If you touch 'y' the queue will be cleared. Any other key, and it will not be.

- x Where x is a number. Prompts for 'remove last x items from the queue?'. Touch 'y' and it will be done.
- up arrow Executes queue. Enter this command when you want Scopy to do all the things you told it to.
- fast & slow Whenever possible, Scopy uses a fast file transfer system in which the file being transferred is never actually in the computer. Slow mode is automatically used on relative files, and certain conditions may make slow mode preferable on other files as well. For example, a non-Commodore disk drive or a fast dump to a modem might find the slow mode more practical.
- t & f Commands that you wish to issue directly to either the 'to' or the 'from' drive may be sent with this command. For example, a format could be sent by 'tn0:test.a1'

- tre Toggles a display of the bytes tree in the upper right hand corner. This slows down the directories and scrolling, so it's best left off. It will come on automatically just before a garbage collection occurs.
- gar Force a garbage collection. This command reduces memory usage to its minimum, so you can get a true bytes free. A garbage collection removes all directory history entries except the last 48, so you can only scroll backwards over the last 48 directory entries..

THE QUEUE

The queue automatically fills as you enter files to be operated on. It may be erased or items removed. When the queue is executed, two possibilities exist. It may either be re-executed or it will be cleared and a new queue started. To re-execute the queue, just enter the up arrow command again. To clear the queue and start a new one, just start the new queue. The old one will be cleared automatically.

Herckenrath Box

Terry Herckenrath

142 Glenforest Road
Toronto, Ont. M4N 1Z9

This new monthly column will be dealing with the VIC-20 only. The general format will be of a question / answer type, geared primarily to the beginning user of the VIC-20. More advanced questions are of course also welcome, but may not necessarily be answered through the TORPET. In

those cases the person who submitted the question will be contacted directly. Send your questions to my home address (see above) rather than the TPUG office.

Aside from answering questions, I'll also try to come up with useful hints about BASIC and the VIC-20. If you know some useful tidbits, please do not hesitate to share them with your fellow VIC-20 users. PLEASE send them in.

Stick to VIC

by Terry Herckenrath

PROBLEM... You want to use the function keys in a program. You have a Super Expander plugged in and you find you can't 'read' the function keys.

SOLUTION...The Super Expander has a 'wedge' into the keyboard decode logic. The keyboard decode logic basically tells the rest of BASIC (and your program) what key(s) are being pressed. This wedge intercepts the function keys,

and never tells the rest of BASIC (and your program) that a function key is being pressed. To be able to 'read' the function keys, you'll have to 'remove' this wedge. This is done by the following two POKES:

POKE 655,220 and POKE 656,235
Locations 655 & 656 contain a pointer to the keyboard decode logic. By poking the above values, you are in fact restoring the VIC's own keyboard decode logic.

That \$28 Modem And Your PET!

By Richard Bradley

Toronto, Ont.

Many people have discovered the existence of modems for \$28.00. Some of these people have them running now, and seem to be quite happy with them. If you are in this position then you don't need to continue reading. But there are others who have the modems on the shelf, because they don't know how to hook them up to their PET.

As any of you will know from looking at the sheet that comes with the modem that it requires +5 volts, +12 volts, and -12 volts. This may be the main reason that many of you have not continued with your project. I know when I first saw the voltages required I got kind of lost for a while. I had no problem with the +5 and +12, but the -12 kind of knocked me for a loop. I thought about building a power supply for it, but decided to do some measuring inside my PET. There seemed to be two interesting sets of pins on the left side of the circuit board, and I figured they warranted investigation. After a bit of measuring I found that a +11 volts, and -10.5 volts existed on two of the pins. As many people know there is +5 volts on pin 2 of either of the cassette ports. I tried these out, and nothing blew up. So I then cut up my INTELCOM cable, and did the connections to get the ground, transmit and receive data set up. This did not work. I assumed that the modem must be TTL, and that I was losing the transmission in the resistors. I took out the resistors, and it worked!

To get your modem to work this is what you have to do:

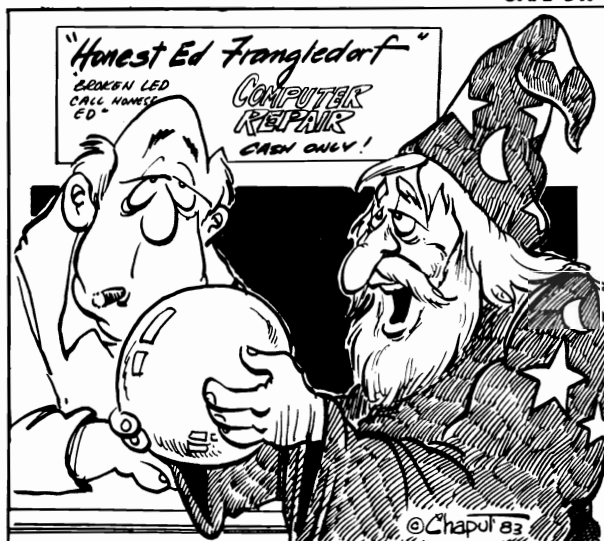
1. Connect the green (+5 volts) wire to pin 2 of either of the cassette ports.
2. Connect the purple (-12 volts) wire to the front pin of J10.
3. Connect the blue (+12 volts) wire to the front pin of J11.
4. Connect the brown and red (ground) wires to pin A of the user port.
5. Connect the orange (receive data) wire to pin B of the user port.
6. Connect the yellow (transmit data) wire to pin C of the user port.

To do the above, it is recommended that you buy the proper connectors for the user port and the cassette port. And single pin slide-on connectors will do for J10 and J11. I have provided a diagram to show you where the ports, and pins are. This diagram is from a FAT 40, and will not match up perfectly for all PETs. In fact, if you have a very old PET with a small keyboard it is possible that you may not have J10 or J11, and you will need to build a power supply for the +12, and -12 volts.

I noticed that when I got mine working I had a lot of noise in my transmission. On the circuit board of the modem there are three variable resistors. I played with all of mine, but found that only one of them helped me with noise problems. I have provided a diagram that shows where the three variables are located. R1 on the diagram will help to clear noise problems. R2 will vary the frequency of the carrier. R3 will vary the volume of the carrier.

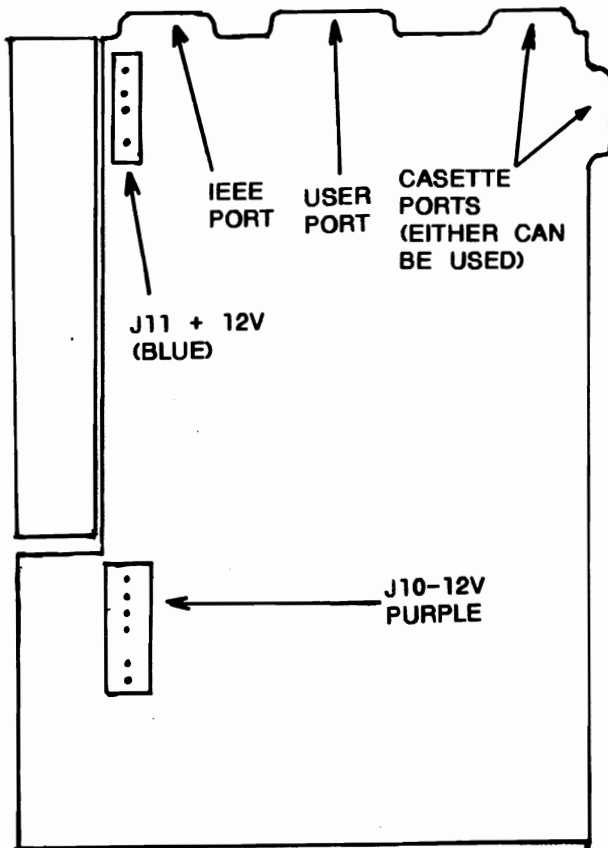
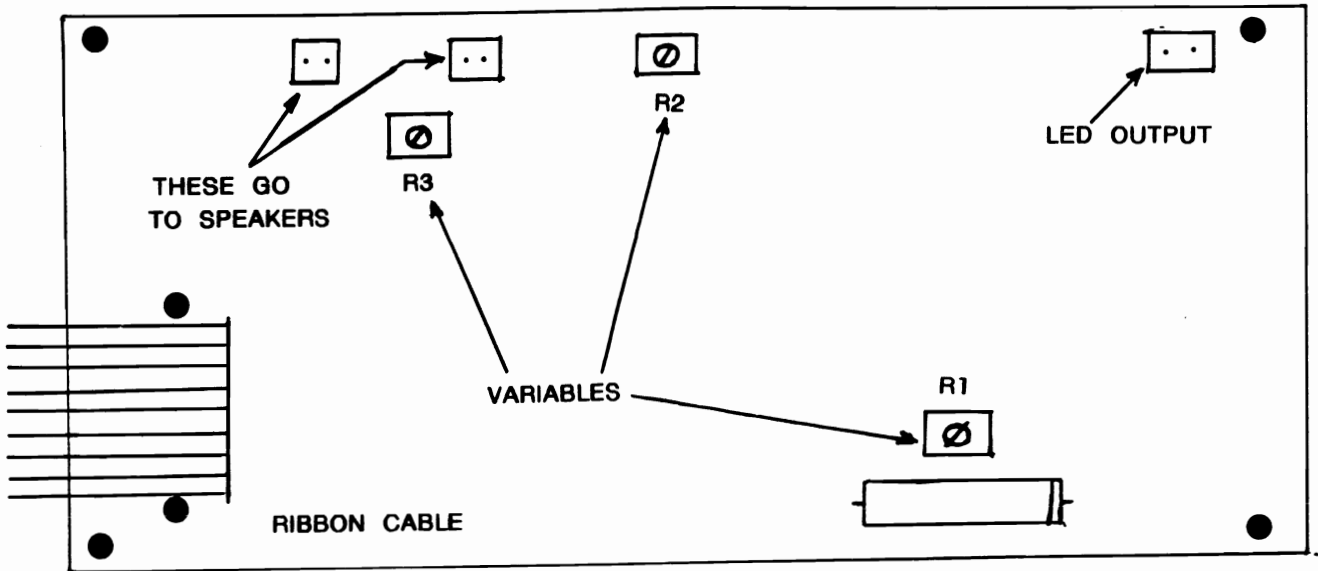
If you would like someone to do the wiring for you or need any additional information feel free to give me a call at 1-416-782-7320. Or if you get your modem going leave me a message on the NORTEC BBS, 1-416-487-2593.

CHAPUT!



I WANT YOU TO ADD A MODUM SO I'LL HAVE A DIRECT LINE TO THE NETHER WORLD.

PET



MODEM	PET
BROWN	PIN A USER PORT
RED	PIN B USER PORT
ORANGE	PIN C USER PORT
YELLOW	PIN 2 CASSETTE PORT
GREEN	FRONT PIN OF J11
BLUE	FRONT PIN OF J10
PURPLE	

NEW PRODUCTS

"BACKPACK" BATTERY BACKUP SYSTEM AVAILABLE FOR COMMODORE COMPUTERS

BackPack, a battery backup system for Commodore PET and CBM microcomputers and floppy disk drives, will prevent loss of data due to power shortages or line surges.

Designed and manufactured by Electronic Technology Corporation of North Carolina, **BackPack** supplies a minimum of 15 minutes reserve power to 32K of memory, the video screen and tape drive. **BackPack** fits right inside the microcomputer cabinet, and can be installed easily by a novice user. **BackPack** is recharged during normal operation and has an integral on-off switch.

BackPack measures 5.5 inches x 3.6 inches x 2.4 inches and weighs 4.5 pounds. It takes 16 hours to be fully charged, and supplies reserve power for at least 15 minutes. It is available in various voltages, and the battery life expectancy is three to five years.

The **BackPack** system can be used on Commodore PET 2001 and 4000 series microcomputers, the C2N Cassette Drive, and the 2040, 4040 and 8050 dual drives. It will also give power to the CBM 8000 series micro, but the screen size will not be normal on battery backup.

See your dealer for details.

Word Recognition Probe for the LA-12 Logic Analyzer

The **WRP-1** Word Recognition Probe gives the LA-12 twelve channel Logic Analyzer full word recognition capability. The **WRP-1** allows the designer to start or stop the analyzer at a definite address or logic state in a program sequence. The data stored in the logic analyzer can then be viewed on the LA-12 to analyze the data relevant to that portion of the program sequence.

A total of 18 inputs allows the **WRP-1** to trigger on a full microcomputer address. Each input has its own three position switch for selecting positive, negative or don't care status for each input bit.

The **WRP-1** retails for \$ 195.00 and is available from stock.

See your dealer for details.

Commodore 64 to RS-232 Interface Cable \$79.00

Connecticut microComputer Inc. introduces the ADA 6410, an interface cable for the Commodore 64 to RS-232.

The cable plugs into the RS-232 port of the computer and provides voltage conversion to drive standard RS-232 printers, terminals, and mainframes.

The unit is complete with a six foot cable, and all electronics are completely enclosed. Power is received from the computer. There is no special software needed. Address #2 is used.

The ADA 6410 retails for \$ 79.00.

See your dealer for details.

IEEE-488 64 Digital Channel Data Acquisition Input Module

Connecticut microComputer announces a new C-64 digital line input module which is a self-contained IEEE

488 (GPIB) bus compatible device. It is the first product in the **BUSster** series of I/O modules.

The **BUSster A64 Digital Input Module** accepts commands from any host computer through its IEEE port, reads and stores data from up to C-64 digital TTL level lines and then sends this information back to the computer. A **BUSster** module economically increases a computer's interfacing capability while reducing its workload.

This is easily programmed through BASIC commands from the controlling computer. The built-in timer and buffer allow data sampling and collection to occur, while the host computer is occupied with other tasks.

The **BUSster A64 Digital Input Module** sells for \$495.00 in standard version, including case and power supply, and is available from stock.

See your dealer for details.

R6511Q Single Board Computer (CmC SBC6511)

This new single board computer uses the recently announced R6511Q microprocessor from Rockwell International. This advanced microcomputer chip uses an enhanced version of the standard 6502 instruction set and has an on-chip clock, asynchronous serial port, event counter, timer, 192 bytes of RAM and other features.

The basic configuration of the CmC SBC6511 includes the R6511Q CPU, power supply, address decoders, 1.8432 MHz crystal, serial port operation to 19200 baud, an 8 position CPU readable DIP switch, expansion ports and sockets for 2KB of RAM and up to 8 KB of ROM.

Options include: an IEEE-488 (GPIB) interface; an RS-232 interface; case; power pack; development board with monitor, trace, disassembler, etc.; assembler; digital and analog interfaces.

The basic board requires 9 to 12 Volts AC or DC at 300 milliamps for power.

The retail price is \$ 189.00 with substantial OEM discounts.

See your dealer for details.

New Commodore VICMODEM package now available

Commodore Computer has announced a **VICMODEM** package for users of Commodore's VIC-20 and C-64 personal computers.

Included in the package are: the popular **VICMODEM**; a white Northern Telecom telephone with the Commodore logo; a modem tape containing all the necessary software to use the modem with the VIC-20 or C-64; one free hour of time on the CompuServe service; a free hour of the Dow Jones News/Retrieval Service; and savings on subscriptions to other information services including MarketScan and Info Globe.

The **VICMODEM** allows the users of a VIC-20 or C-64 to access the world of telecommunications, send electronic mail and telex messages, and to access numerous information sources ranging from wire services to stock quotes and encyclopedias. Shopping and banking are some other uses of the **VICMODEM**.

To find out more about the new Commodore **VICMODEM** package, contact an authorized Commodore Computer dealer.

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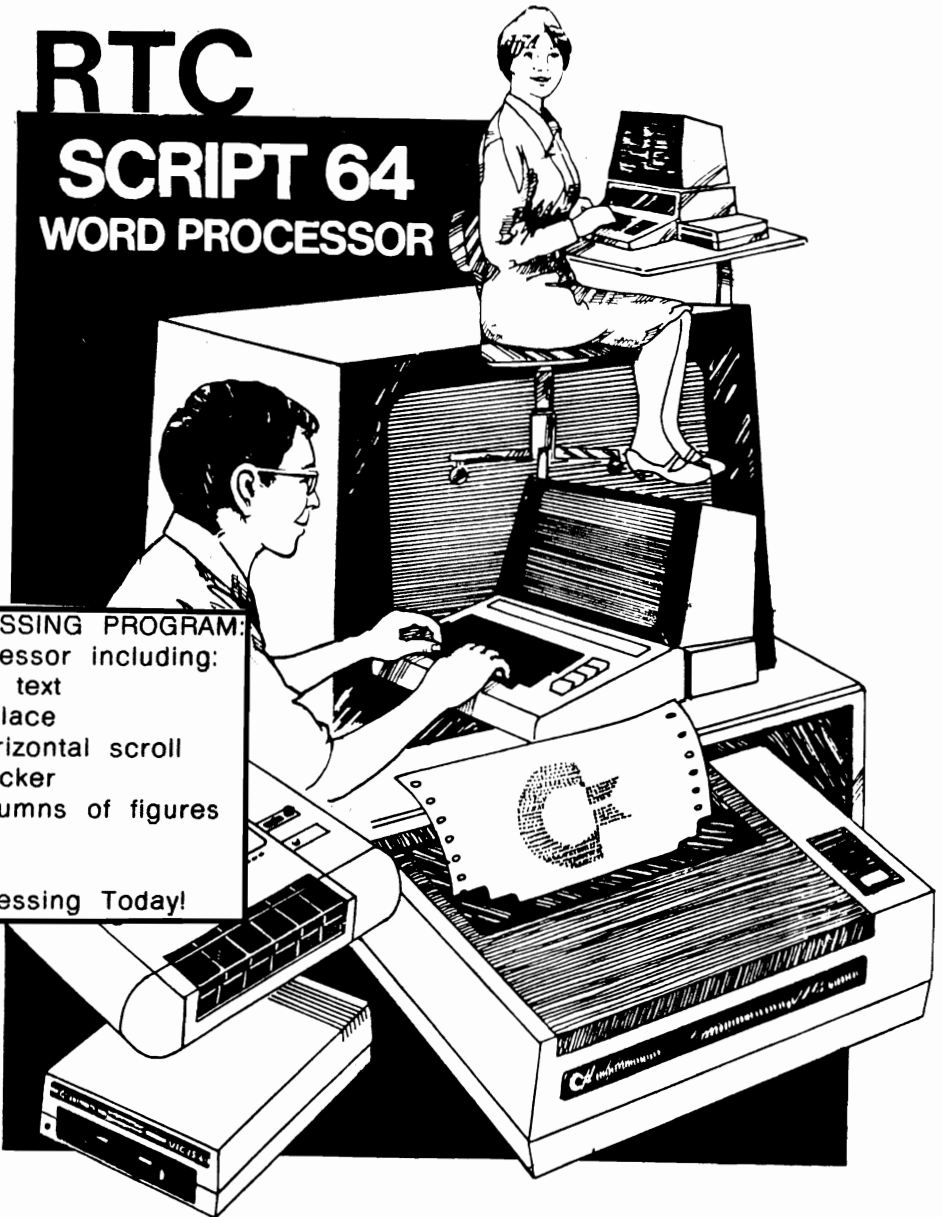
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SuperPET APL Disc Review

TPUG-ST1

by Carol Shevlin

Toronto, Ont.

For those who've never seen APL, I should mention that it looks very unlike other high level languages. APL is written in a form of shorthand where one keystroke will do the work of several lines of code in Basic or Pascal. It is convenient in a finance or mathematical environment for personal computing. However, the shorthand format can render a program unreadable even to its author if it isn't well commented. I really enjoy it and think that other SuperPET owners will too, once they give it a try. The SuperPET APL is a faithful version of the APL that is available for much larger machines, as opposed to being a "tiny" version. All the special characters are available and the flavour of the language comes across unimpeded.

This APL disc is a real mixed bag. Some of the workspaces contain programs whose only purpose is to wow the crowd with unreadable hieroglyphics, while others are full of useful stuff.

Since there are 23 workspaces on the disc with an average of 5 programs per workspace, I'm going to review only a few in depth.

Almost without exception, the workspaces whose names start with "byte" are of the 'wow the crowd' variety. To anyone interested in learning APL these will prove confusing and offputting. I suggest you ignore them.

The workspaces that start with "apl.", except "apl.plot", are all taken from the tutorial disc that comes with the SuperPET. They are documented in the "apl.index" workspace, as well as in the MicroAPL manual. They will be useful to any prospective APL programmer. As well, the disc includes the Waterloo workspaces for converting your own APL programs from version 1.0 to version 1.1. These workspaces are called "wsconv.aplold" and "dfconv.aplold".

Now we get down to the more original offerings:

"Tutorial" is filled with variations of the programs from the tutorial workspaces. These offer some insight on the workings of APL's predefined functions, and are therefore of interest to the APL programmer. However, they aren't very useful otherwise.

"Help" and "scans" are filled with descriptions of the various APL predefined functions. These descriptions are, in some cases, more detailed and better presented than the ones in the MircoAPL manual.

"Print" contains programs to allow APL printing to a CBM printer. Since I don't own the appropriate printer, I'm not in a position to comment on if and how well these might work.

"Publications" contains a list of APL reference materials.

"Pert" contains programs that analyse a PERT diagram. The documentation is scanty, but adequate if you've studied PERT diagramming. If you haven't, I'll just say that the PERT (Program Evaluation and Review Technique) diagram is a network model which is used to plan, schedule, and control complex projects. I'm planning to use this program at work (I wonder if Gord Campbell's done a PERT diagram for the TPUG Conference?).

"Apl.plot" will graph the results of a given function over a given set of values. It's not the most sophisticated plot routine I've ever seen, but it's easy to use and the results are rather neat. The program always formats the graph so it will just fill the screen. This makes the results easy to read but tends to distort the graph if your interval gives results in a very large range.

"Etimar79pg24" is filled with 14 programs from the magazine. They are mostly concerned with character string manipulation; something APL is not well known for. Also in the workspace is a program called 'solve', which does some linear algebra for the fans. APL IS well known for its capacity to handle arrays in n-space. As well as these useful programs,

SUPERPET

there's one called 'accum' which is one of the worst examples of the 'wow the crowd' type. According to its own comments "A is a matrix... Result is the first 2 columns of the matrix... why is not clear". To me, why bother?" is not clear.

"Matrix" solves simultaneous linear equations which have been randomly generated. More linear algebra for the fans.

"Sep27" contains various short APL programs. All of these are mathematical functions. These will be of interest to prospective programmers and math students. If you've been dying for a

program that gives the sine of an angle stated in degrees instead of radians, this workspace is for you!

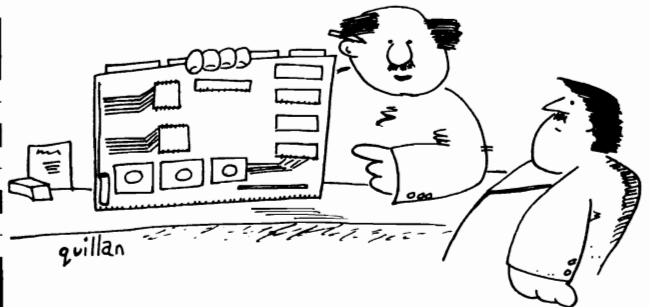
Well, that's about it except for one workspace called "wscreate". I couldn't quite figure out what this one was supposed to do. So, I'll let it be a challenge to you.

One hopes that as, if, and when the proposed APL group gets going, we'll see some more programs become available that are useful to the general public. I've got this one-liner that returns a set of lottario numbers.....

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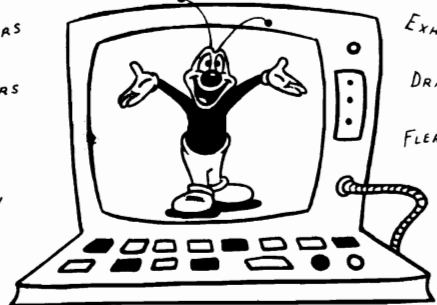
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CLUB ACTIVITIES

"Getting Started"

by Betsy Byrne

Albuquerque, NM

The 'New Mexico Commodore Users' began, as I would assume many other Commodore groups have, with an outpouring of enthusiasm and ideas from users, chance met in a local Commodore dealership, Omega's Computer Connection. My husband, Danny, and I work for Omega on Saturdays, so it seemed natural to approach the owners to discuss using the store for meetings after hours and also to request their sponsorship to get us started. We also contacted other local Commodore dealers about helping sponsor the group, but none of them felt they were able to get involved to that extent, although they thought it was a good idea.

Armed with whole-hearted approval and promise of cooperation from Omega, Danny and I called Commodore headquarters in Pennsylvania and were put in touch with Jeff Hand, who is also on the staff of the Commodore Magazine, Power Play, and is a Systems Operator for the Commodore Information Network. I knew we were on the right track when he asked "Is this call costing you money? Let me call you back, and he did! Jeff was very supportive and gave us lots of encouragement, explaining that Commodore likes to interact with as many users as possible and that the user groups are one of the best formats for doing this. We also discussed the obvious benefits of users sharing information and ideas, the ability of the group to maintain a public domain software library, and to serve as a foundation for specific interest clubs such as sound and graphics, or telecommunications.

Another important phone call we made was to Jim Butterfield in Toronto, who needs no introduction to readers of Compu-te! and the Commodore Magazine. Jim is a member of TPUG (Toronto PET Users Group), one of the oldest and most respected Commodore Groups. He had several suggestions for us as to how we might structure our group and he certainly instilled a large amount of the confidence

we needed to organize this user group! Now, feeling we were on firm ground, so to speak, we put ads in the classified section of all the local newspapers under 'Computers', put up a sign at Omega, and called the other stores that sell Commodore products so they might inform their customers.

When the day of the meeting arrived, we had about fifteen people signed up. I borrowed folding chairs so that we had seating for 22 people in the Omega Computer Connection store. A half an hour or so before the meeting I went out to pick up some coffee and refreshments. Picture my amazement when I returned to the store to find more than fifty people waiting for me!! In spite of somewhat(!) crowded conditions the meeting was an unqualified success. We have now moved to a larger meeting place provided by a local bank.

Our meetings usually follow this format:

1. We have a short business meeting and vote on such things as plans and major expenditures.

2. A speaker is introduced or a demonstration is given of interest to the entire group.

3. We break up into sub-groups and gather around our respective computers, usually for a computer specific demonstration followed by a question and answer session.

Then general discussion and socializing takes over, with people practically waiting in line to talk to some of our more knowledgeable members!

Our group organization is as follows: Several members are chosen from each sub-group to serve as an executive board. The executive board elects the officers and makes executive decisions for the group. A monthly newsletter, that is free to members, is published by the group with additional copies sold in local stores to help pay for the printing costs.

In between the umbrella Commodore group meetings are meetings of the PET, VIC-20, C-64 and other clubs including machine language, graphics, and womens'

CLUB ACTIVITIES

BASIC study. We are organizing two children's groups called the 'Commodore Kids', a pre-teen, and a 13 to 17 group. One of our main goals at the moment is to obtain a permanent place from which to administer our software and print libraries, and to provide a hot-line phone service staffed by volunteers to answer questions and solve problems.

We now have over one hundred members and we are still rapidly growing due to the increasing popularity of Commodore products. Our advice to anyone who has been thinking about joining or organizing a Commodore User Group is: **DO IT!** You won't believe how much fun it is and how rewarding it can be until you try it.

MEETING REPORTS

R.A. Russell

Uxbridge, Ont.

VIC-20 CHAPTER MEETING

The VIC chapter had a lively meeting May 4th, with an overflow crowd of more than 100 people. Due to this, the next meeting will be at the Earl Haig Auditorium, which has space for 800 people. A 4-part series of seminars or teaching sessions for the combined VIC-20 and C-64 people was mentioned. It is free, but pre-registration is required. Call (416)249-5805 and leave your name on the answering machine. Location - York Public Library at Northcliff and Eglinton, between Vaughan and Dufferin. Dates are July 4, and 18, August 2 and 22, at 7:30 p.m.

Next, a series of programs was demonstrated:

1. **A mortgage interest calculation program** was found to be very good.
2. **GRUNG**-A game like Clue was shown, different each time. Allows you to go around a castle and attempt to ferret out clues as to who is the murderer, the weapon and the location.
3. **VIC Hangman**-A well-presented game with good graphics.
4. **DATA ENTRY Program**-A small version of Visicalc--of limited interest unless you have extra memory.
5. **WORD PROCESSOR**-On tape for May, not demonstrated much.

A Digital Interface unit was plugged into the VIC-20 which has write protect switch, a 6-position memory selector switch so games etc., in cartridge form may be left plugged in. Unit was well made and received praise from the membership. For further information, call the office.

A VIC Graphics package from Abacus Software, \$39.75, was demonstrated. This permitted plotting, colour changes, shape drawing and was quite fast. Sine waves and 3-D pictures of waveforms were demonstrated. For those who want a couple of lines of programming so your program can address any size VIC, try:

```
10 SC=POKE(648)*256: CL=38400: IF SC<>680
   THEN CL=37888 (SC=location of top left
   of screen memory, CL is location of
   colour memory)
```

AID - A tool which allows changing items in a program, renumbering and other nifty items were mentioned.

Dave Simpson showed his program for keeping track of school courses, ENROLL 8K. Seems like a useful program for those needing this type of data storage and processing (print routine not tried yet!). See this on Lunes' tape.

Chris, with his knowledge of VICs, showed screen manipulation. Example: Supposing you wanted to put "Test" on line A and be able to change A and "Test" to whatever line and string desired, try this:

```
10 Open 1.0:PO$="SQQ....."[use Rev $ for
home, Q for down cursor (21 of them)]20?
PO$:"QUES":INPUT#1,A,A$?:LEFT$(PO$,A):A$:
GOTO20
```

Another idea is to print *12* with no sign space or trailing space. The statement ?"":A"" yields * 12 * IF A=12

12. Use ?"":MID\$(STR(A),2):"", namely make A a string and take the string beginning at 2nd character.

CLUB ACTIVITIES

Lastly, Chris showed how to ask for Yes or No answer with desired answer as a default value. Try this:

10 Input "Yes or NOJJYII";A\$ - rote J =right cursor, I=left cursor.

20 If A\$<>"Y"And A\$<>"N"THEN 10 - note we do not accept any answer but Y or N.

Calendar of TPUG Events

There are no monthly meetings for the Central, Westside, VIC-20 and Commodore-64 chapters in July and August.

Four summer sessions for those VIC-20 and C-64 owners who are new to computers--pre-registration required

Mike Hyszka 416-249-5805

July 4, July 18, August 2, August 22

TPUG ASSOCIATES CLUB CHAPTER MEETINGS

PET Educators Group

(Windsor, Ontario)

-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 519-948-5327

London Commodore Users Group

-meets at Althouse College of Education on the last Monday of each month at 7:00 p.m.

-contact Dennis Trankner 519-681-8059

Genesee County PET Users Group

(Flint, 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

Views From The Better Half

by Marty Campbell

Toronto, Ont.

There are attributes that I was never told I would need as a wife; but I soon found out, and my daughter is getting an earful.

As wife and mother of TPUG members, my life is naturally affected. There are computers all over the house. Dinner conversations are reduced to PEEKs, POKEs and streams of numbers. There are stacks of computer magazines and reference manuals lying around. All of this is okay for family living, but it gets rather crowded at holiday parties. One Christmas gathering to which I was looking forward, had PETS in the library, a PET in the kitchen and a C-64 on the piano bench, beside the Christmas tree. The only festive music was the C-64 Promo playing (over and over) Jingle Bells, Rudolph, Silent Night and Frosty looking like he needed directions to the men's room.

As wife of the Conference Co-ordinator, I was even more involved. At least half of you TPUG Members who registered for the Machine Language Course will remember that it was I who answered the 'phone and took down your name, 'phone number, and TPUG number. For several weeks the 'phone in our house rang constantly. This should have been a hassle, but you TPUG

people are the greatest! More than one call led to bright, witty conversation. I shudder to think of the 'phone bills some of you Americans will be receiving. How could I possibly mind my husband being part of such a nice group of Commodore--user people!

Now the bottom line - to all you wives and mothers - THE SECRET IS, (when tripping over cables, or trying to dust under and around printers and monitors), PRETEND YOU DON'T MIND! In time you won't.

WORLD'S WORST COMPUTER PUNS

by John Ylimaki

If you are the VIC-tim of a HACKING cough, VIC's cough drops are useful. Cheer up it's not TERMINAL. If you can't shake the BUG see your doctor for an IPOdermic.

DEBUGGING programs is a little like swatting mosquitoes. Eliminate one BUG and you may find 20 at its funeral.

CLUB ACTIVITIES



by Doris Bradley

TPUG Office

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 in this or the June issue) to:

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

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

HELPFUL HINTS

Our mail has indicated that many of you had difficulty with the Program and Disk identifications in our 'old' listings. (These are found in TORPET 12 or the Whole PET Catalog pages 244 to 275.) This information can be helpful so here are some clues for you.

Program Identification

STAR WARS X3 P 25 TPUG BEST-GAME 1

The explanation is:

STAR WARS - is the name of the item
X3 - indicates the disk on which "it" is found
P - indicates "it" is a program rather than a sequential file (S)
25 - indicates "it" takes up 25 blocks on the disk

TPUG BEST-GAME 1 - is the name of the disk on which "it" is found

If you have the 'old' listing, look in the alphabetical listing of programs and you will see that STAR WARS is also on G2 and X4; that there is a VIC-20 version on V1; and that there is STAR WARS! on G2.

Disk Identification

In the second section of these 'old' listings details of each disk are found. Taking X3 TPUG BEST-GAME 1 and looking at the entry for STAR WARS we find:

STAR WARS X3 P 25 0401-1C81

The explanation is similar. The one difference is the last column. These are hex numbers. The program starts at hex 0401 and ends at hex 1C81.

WHO'S GOT THE ANSWER?

I own a SuperPET and have been making

comparisons between Waterloo microBASIC and CBM COMAL-80, which are more similar than many people may realize.

I would like to contact others interested in COMAL to compare the various versions. My own, of course executes as if on a CBM 8032. I would appreciate news from any user with COMAL on a CBM 8096, or the Instrutek ROM, or Z-RAM, or CP/M. I doubt that as yet there are any users out there with Apples or CBM "64" COMAL. When there are I would like to hear from them too.

Harry D. Baecker

5335 Valiant Dr. NW
Calgary, AB T3A 0Y9

I've been doing a fair amount of programming with the 1541 disk drive and my C-64, particularly with "relative files". While my overall reaction is quite favorable, there have been quite a few glitches that have caused me some frustration. For instance, certain combinations of four sequential and relative files simultaneously opened seem to confuse the 1541. I would like to get in touch with other 1541 users to compare notes.

R. B. Yori

Copley, OH

Are there others interested in using the computer (VIC-20) to control and monitor devices outside the computer such as furnaces, power supplies, meters, A/D converters etc.?

Paul DePriore

Somerville, NJ

I need a good, colorful, graphically realistic, stimulating, adventure game for the C-64--any suggestions?

Gloria Bears

Stanton, CA

'PET' PALS WANTED

The last question reminds me that there are a lot of people out there interested in adventure games. (TPUG's disk X5 is a non-graphic one.) Does a group exist to compare notes on how to 'get past the bear' or whatever?

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Jim Clefstad, Box 154, Mackenzie, B.C. V0J
2C0(1)

Used CBMDual Disk Drive 4040. Call Ken,
(416)483-5649.

Has anyone seen or heard from Dr. Daley?
Has anyone experienced and solved
problems with Dr. Daley's Mail List version
A.4 or newer? We invite correspondence in
an effort to retain the utility of this ver-
satile software. Call collect (201) 658-3133
or write L. K. Shick, Stampsoft, P.O. Box
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Attention VIC-20 and Commodore 64
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"FOR SALE": COMMODORE 8032 microcomputer and 8050 dual disk drive (one megabyte capacity), like new. \$2500.00 for the pair. Will not sell separately. Write CS Design Inc. Box 602, Waterloo, Ontario, N2J 4B8. (2)

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 G.AID PROG#2.PAL
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 TERM.R12A/1G
 TERMINAL.R12
 TERMINAL.S12
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 VT52BIN
 VT52BASIC
 CBM 8010
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 TERM INST.WP 1
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LIST-ME.C3.L.V0
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 PHONE NUMBERS.P
 WWV.8
 WWVI.8
 WWVII.8
 WWVIII.8
 WWIX.8
 WW WORD LIST.D
 WWI.4
 WWII.4
 WWIII.4
 WWIV.4
 SUPERSPEED SORT.
 LIST-ME PX8.L
 NOS TRANSLATOR3
 FINANCE 1.4
 MUSIC LESSON
 MUSIC LESSON 2

X9 - TPUG BEST MISC.P

COPY-ALL
 MULTI-INVADERS!
 WATERMELON
 SPREAD SHEET 40T
 SPREAD SHEET80DT
 PRINT USING
 PRINT USING&TEST
 PRNT USING ML
 SCREEN ROUTINES
 BAS&ML COMBINER
 QUIET AFTERNOON
 Q-BACK CHALLENGE
 COSMIC FIGHTER
 HEX DUMPER 80
 FIZZBIN
 FIZZBIN 8K RULES
 FIZZBIN 8K GAME
 PUKMAN
 STAR SYSTEM
 WARLORDS INSTR
 WARLORDS GAME
 BLOCKADE
 ALIEN BLASTER
 OUTPOST-ML3
 OUTPOST
 LIST-ME PX9.L
 MINEFIELD 2

XA - TPUG BEST MISC.P

VISIBLE PET
 TOLL BRIDGES
 STAR LANES
 TV SATELLITES
 BILLBOARD
 DOCTOR 8032
 DOCTOR.INS
 BOWLING
 SIMCAL INSTR.W
 SIMCAL.Z
 LOAN AMORT.8
 SCOPY5.8
 SCOPY INSTR.8
 FAST INVADERS.8
 CRYPTOGRAMS.P
 TURTLE.8
 CBM.4032 V2P
 WP BUSTER/PET.P
 DISK LOGGER.P
 SUPERMON INST.P
 SUPERMON1.REL.4
 SUPERMON4.REL.P
 SUPERMON2.REL.P
 MORTGAGE.Z
 DISASSEMBLER.P
 PROG CONVERTER.Z
 STORYWRITR/V10.P
 LIST-ME PXAL

XB - TPUG BEST EDUC.P

SCREEN PRINT
 FILE MAKER
 A
 B
 C
 D
 E
 F
 H
 I
 J
 K
 L
 M
 N
 O
 P
 Q
 R
 S
 T
 U
 V
 W
 X
 Y
 Z
 SCREEN
 HOME ROW
 ALL ROWS
 G
 FLASH
 FILE MAKER II
 HIGH WRIST
 LOW WRIST
 SHIFT LOCK

SIGN
 \$ SIGN
 % SIGN
 NUMBERS 1-5
 NUMBERS 6-0
 EACH NUMERAL
 ALPHA PROGRESS
 DUM 3.4
 KEYBOARDING
 COVER
 LIST-ME PXB.L

C-64

(C) CONTEST

D CAMPBELL-----
 LIGHT CYCLES 64!
 D FRANCIS-----
 VOYAGER VI
 40 RADIUS
 60 RADIUS
 SPHERE.1
 10 DEGREES
 20 DEGREES
 30 DEGREES
 45 DEGREES
 60 DEGREES
 70 DEGREES
 80 DEGREES
 90 DEGREES
 120 RADIUS
 150 RADIUS
 180 RADIUS
 ET.PLOT
 GLOBE

(C)TU - TPUG MAY/83.C

LIST ME TPUG MAY
 PONZO TUTOR-5.C
 PONZO TUTOR-6.C
 PONZO TUTOR-7.C
 BACH FUGUE.C
 ENTERTAINER.C
 TERMINAL.64.2.C
 TERM.64.C
 NIGHTMARE PARK.C
 WHEEL FORTUNE.C
 YESTERDAY.C
 C-64 GRAPHER.C
 64 H-R PLOT M/L
 BLACKJACK.C
 BIRTHDAY.C
 TWIN BAGELS.C
 SUBMARINES.C

(C)E1 - TUTORIALS.C

LIST ME E1
 PONZO TUTOR-1.64
 PONZO TUTOR-2.64
 PONZO TUTOR-3.64
 PONZO TUTOR-4.64
 PONZO TUTOR-5.64
 PONZO TUTOR-6.64
 PONZO TUTOR-7.64

(C)E2 - TUTORIALS.C

LIST ME E2
SPRITES TUT-1.64
SPRITES TUT-264
GRAPHIC TUT-1.64
GRAPHIC TUT-264

(C)G1 - PICTURES 1.C

LIST-ME CG1.L
CONT.LDR.ML
III RES LOADER
SCREEN
CONT.LDR.PAL
SPIRAL.1
SUE
KAREN
SNOOPY
ALBERT
DOLLAR
DIP
SNAIL
DES.1
7-3HILL
MUSIC
MAP
DIANE
WILLY
RACCOON
SINCOS1
WATCH
WINSTON
MICROMETER
NUDE

(C)G2 - PICTURES 2.C

LIST-ME CG2.L
CONT.LDR.ML
III RES LOADER
SCREEN
CONT.LDR.PAL
SQUEEZE
TEX
IIPALONG
GUY
FIG1
FIG2
FIG3
MOUND2
EYES
FRIENDS
SINCOS2
SATELLITE
DONALD.DUCK
VM.THINGS
SESAME.ST
NUDE.REV
VIS.ROSETTE
VIS.G1A
XMAS.CARD.1
4HILL5

(C)S1 - MUSIC/SOUND 1.C

LIST-ME CS1.L
THE KANON.C
BACH FUGUE
ENTERTAINER.C
YESTERDAY.C
BACH DUET.C
ORGAN.C

DIXIE.C
TWINKLE.C
YANKEE.C
GUNFIRE.C
PONG.C
RAYGUN.C
SIREN.C
ALIEN.C
BELL.C
BOMB.C
CLAP.C
PIANO.C

CANADIAN MORTGAG
STAR DESTROYER
VIC ARTIST
MATHOFF
POKER! INSTRNS
ZARZON BASE
SNAKES & LADDERS
PLOW BY NUMBER
DIANE'S NUMBERS
TYPING TUTOR
MARSTON CITY
LUNAR LANDER
MUSIC
MUSIC - J.B.
POKER - VIC
VIC ALARM CLOCK
LABEL MAKER V3

VIC-20

(V) CONTEST

FALLING STAR
THE HELICOPTER
HELI. PART 2
FORT. HUNT.INST.
FORTUNE HUNTER
UXB PART 1
UXB PART 2
MINESLIDE
SUB-SINK.INST
SUB-SINK.MAIN
INDEX
VIC TEXT EDITOR
VIC-DATA BASE
VIC SPIRAL
MINER-8K-INTRO
MINER-8K-GAME

(V)TV - TPUG JUNE 83.V

LIST-ME VTV.L
DRIVE DISM
CROWN 3D
CALCULATE BASE.V
ALPHA. SORTER.V
METRIC CONVERT.V
DATE FORMATER.V
SPEED READING.V
ENROL LIST 8K.V
VISION TEST.V
LONG DIVISION.V
ONE ARM BANDIT.V
TARGET SHOT.V
STARSHIP 3K.V
PING/PONG(T).V
STATE CAPITAL.V
USA SONG.V

TPUG's This and That

It was great to meet so many of our members at the conference. A number of you pitched in and helped at the registration/disk return desk. A great big Thank You!!

Club Chapters

There are now 3 club chapters affiliated with TPUG. More than 180 members of PET Educators Group (Windsor, Ontario), London Commodore Users Group, and Genesee County PET Users Group (Flint, Michigan) have saved \$5 each on their associate membership fees and each of these groups is receiving at least 1 free disk of the month. The details of their meeting places and contact people appears elsewhere in 'Calendar of TPUG Events'. Are there any other groups interested in a similar arrangement? Details are in the TPUG information package (the insert in the March/April TORPET).

PET Emulator

It has finally arrived in Canada! We hope to have a summer student assess the PET library in order to find out which of the PET public domain programs work with the C-64. If you can tell us about any of our PET disks, please do. Many hands make light work.

HAM Radio

VIC-20 NET 8:30 pm Mondays at 3760khz (75 meter band) NET Manager Joe Cain VE3ANJ, NET Control Bill Melhivish VE3AOY

Commodore User's NET--9 am Saturdays at 7158 khz (40 meter band)

-also 2 pm Sundays, local time, at 14230 khz (20 meter band)

TN Disk/Tape

TPUG has a policy of only having public domain software on TPUG disks. As soon as we become aware that a copyrighted program is on a disk/tape we remove it. This is why you will NOT find Frogger and Centipede on TN. The new listings for the library will delete any mention of them.

Commodore Educational Software

This summer, this software is being upgraded and enlarged (up to 1/3 more programs). This upgraded software will be available in the Fall.

Stamps

A number of people closely associated with the TPUG office are stamp collectors (philatelists), so if you have the option please use unusual stamps rather than ordinary ones. In philatelic terms we like commemoratives rather than "definitives". Thanks.

Doris Bradley

Assistant Business Manager

PET/CBM/COMMODORE 64

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