*Commodore's PET is a factory-assembled personal computer based on a 6502 microprocessor. The original PET, model 2001-8, was a $795 system that included a keyboard, cassette tape unit, built-in TV screen, some graphics, upper and lower case, extended 8K BASIC, and 8K of user memory.*

*SPOT is devoted to the host of applications—routine and wild—which PET users have found for their machines, as well as to the nitty-gritty of repairs and modifications. In other words, almost anything relating to the PET is fit material for this column. Just send Harry your questions, ideas, and tapes c/o PCC. He'll give each of them his careful attention.*
*— TD*

# SPOT

## The Society of
## PET Owners and Trainers

### BY HARRY J. SAAL

## HEARD AROUND THE QUAYSIDE

Commodore continues to make changes in its product line. The latest is the discontinuance of the original 2001-8 machine, with the built-in cassette tape and small keyboard. In its place is the 2001-8N, which, except for memory size, is identical to its bigger brothers that have 16 or 32K memory. In effect, it means a price increase for economy-minded PET purchasers, since it costs an additional $100 to get a tape cassette. What you do get is the full-size keyboard, and the new corrected ROM set.

Speaking of price changes, Commodore has twice now made a super offer to school systems, given them three machines for the price of two. But recently, the offer was abruptly shortened by 30 days. This caused havoc with many PET dealers, who planned extensive advertising and sales campaigns based on Commodore's offer. It is stunts like this that will cause the PET to lose the backing of its army of supporters.

Several other changes seem to be in the wind. Commodore is getting ready to release a new enclosure for the PET, made of structural foam (like the Apple) rather than steel. The appearance of the PET is somewhat "softened," but otherwise unchanged. The PET and TI 99/4 were the only two personal computers tested by the FCC that meet the July 1980 limits on RF interference. Let's hope this change doesn't affect the excellent shielding currently provided by the metal case. Rumor also has it that Commodore will be switching the character generator on the PET *back* to the

way it was on the first 8K PETs. It was a mistake to change it in the first place, but this will throw even more confusion into the arena!

Lastly, Commodore is hard at work on a "business" machine. The major change is the use of a larger 80 character screen, and built-in floppy disks. (Sound like the Tandy TRS-80 Model II??). Will it have a 6502 CPU, or a 6809 as several of the newer products now under development elsewhere are expected to have? The 6809 is a nice upgrade from the 6502. It contains a series of 16 bit extensions to the current 8 bit architecture of the 6500/6800 family, but to the outside world looks like an 8 bit processor, so all standard peripheral chips are still compatible. Compared to a 6800 it is quite a bit faster; unfortunately when compared to a 6502 running at the same speed it is pretty much even, although easier to write programs for.

## PET TIPS

You may have noticed that on the new PET even when you POKE characters to the screen there is no "snow." This same change permits the PET to print characters or list programs much faster than before, although Commodore's software doesn't take advantage of it. But

you can make your PET go faster by issuing a POKE 59458,62. Now LIST a long program! (To restore the PET back to the normal mode, issue POKE 59458,30.) Doing this on an 8K PET also makes things go faster, but the screen blinks on and off in a very disturbing fashion.

Did you know that the machine language monitor supplied by Commodore is in ROM on the new Pets? The manual indicates that you load it from tape, but it's really there. One quick way to start it up is to SYS(1024). Details about using the monitor are in the User's Manual; remember that an X command gets you back to BASIC.

We all know that programs which do PEEKs and POKEs often work on one model of the PET, but not on the other. I was surprised to see a program which worked fine on an 8K PET have a totally messed up display format when run on a new PET, and there wasn't a PEEK or POKE to be found. There are changes in *BASIC* itself to be wary of! One example is this little expression: typing ?SPC (40);:?POS(0) on an old PET prints 40, and on the new PET prints 0. What changes have you run into?

## PET PUBLICATIONS

The PET Gazette is no longer. Len Lindsay's fine magazine has disappeared, but is replaced by *COMPUTE*, The Journal for Progressive Computing. Issue 1, dated Fall 1979, is already out. It is a beautiful, slick 102 page magazine with lots of good information and sources of products for the PET. Robert Lock, President of Small System Services, Inc., has put together a superb replacement magazine, and has Len Lindsay as his Senior Contributing Editor. As a sign of how much work went into *COMPUTE*, someone managed to get Commodore to pay for 4 pages of advertising, a first to my knowledge.

There is a change in orientation from the PET Gazette. More like MICRO, *COMPUTE* plans to provide information for all 6502 based machines, which includes the Apple, KIM, SYM, AIM, OSI and the new Atari. You can subscribe to The Journal for $9 for six issues (one year). An alternative is a $7.50 "personal/retail" subscription, where your copy is bulk delivered to a local dealer for you to pick up, instead of

being sent by Pony Express. Sounds like a cheaper and faster way to get *COMPUTE*. Subscriptions can be ordered from *COMPUTE*, P.O. Box 5119, Greensboro, NC 27403. All technical correspondence can still be sent to Len Lindsay, 1929 Northport Dr. #6, Madison, WI 53704.

## WORKBOOKS

There are two new student workbooks for beginners learning PET BASIC. Both are in active classroom use, and are designed to be used with the PET at hand, yet don't need an instructor nearby. They gently and effectively introduce the PET, starting with the keyboard. Cow Bay Computing, Box 515, Manhasset, N.Y. 11030 has released *Feed me, I'm Your PET Computer* for beginners. It is available for $4.95, and has a companion book *Looking Good With Your PET* for intermediates (also $4.95).

A series of similar workbooks was developed at San Jose State University, with parallel editions for the PET, Apple and TRS-80. Beginners can get started with *Training your Computer (PET edition)*. Ten or more copies can be ordered from METRA Instruments, Inc., Pickering Division, 2056 Bering Drive, San Jose, CA 95131, for $2 each. Single copies may be ordered from Creative Publications, P.O. Box 10328, Palo Alto, CA 94303, for $4 a copy.

## PET INTERFACES

If you are interested in interfacing any devices to your PET through the user port, or in understanding how the CB2 music works, you probably should take a look at Rodnay Zaks' "6502 Applications Book." It is published by SYBEX, 2020 Milvia Street, Berkeley, CA 94704. This book is chock full of details on all the various peripheral chips that are used in the PET, and includes details about programming them in assembly language. The book costs $12.95 and is available in most computer retail stores.

## PET HARDWARE ADD-ONS

One of the more remarkable gadgets to put on a PET has been developed by Innovision, P.O. Box 1317, Los Altos, CA 94022. The Prestodigitizer<sup>tm</sup> tablet attaches to the PET's user port, and can be used to provide handwritten input
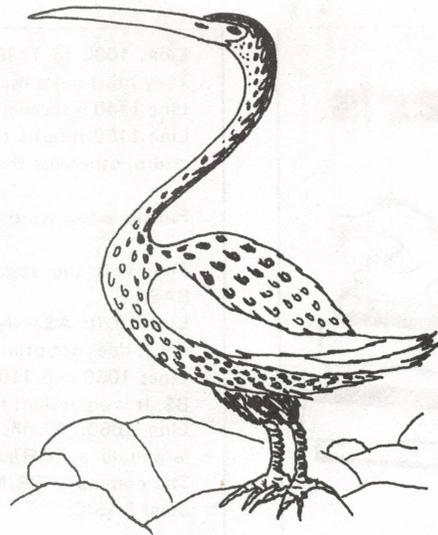
to the PET. (See Prestodigitizer article by David Thornberg, this issue). Sample programs which come with the Prestodigitizer tablet can recognize all the numbers or letters when written on the tablet using the metal tipped stylus provided. In fact, you can even train the PET to recognize your own handwriting. This handsomely packaged device comes with a useful manual, and cassette tape with several sample applications. It costs $48.50 plus $1.50 (and tax in California), and can be ordered either from Innovision, or at local computer dealers.

Have you put sound on your PET yet? If not, the best way to go is to get the Soundware adapter, from CAP Electronics, 1884 Schulman Avenue, San Jose, CA 95124, or your local retailer, for $29.95. It's very attractively packaged, and includes a handy instruction book and demo tape. Even if you already made your own "CB2" sound box, get a hold of the tapes from Soundware called Action Pack, The Classics, and Word Fun. Each costs only $9.95, and contains three excellent programs with sound incorporated. They are well done, and quite inexpensive.

Other sources of interesting music tapes (aside from many of the fine programs still coming regularly from *CURSOR* Magazine) are the Allen Computer Products Music Box 1 and Animation 1 tapes. These two tapes are available at $10 each from Allen Computer Products, 34844 Munger Drive, Livonia, MI 48154. Each contains four selections from Bach, Chopin and Mozart including the Can-Can and Flight of the Bumblebee. All eight programs have amusing animated screen displays while the music plays. Unfortunately the author's attempt

to make the programs run on either old or new ROM machines is somewhat muddled and inconsistent. Just the same, they contain quite a bit of pleasant whimsy, although the quality is not as high as those from Soundware or *CURSOR*.

A light pen for the PET is available from the 3G Company, Route 3, Box 28A, Gaston, Oregon 97119, for $29.95 plus $1.50 mailing and handling charge. The light pen resembles a ballpoint pen, and plugs into the user port of the PET. It requires no external power supply, and adds an additional dimension to games and graphic programs. This type of light pen is quite simple, essentially responding to the presence or absence of light. By displaying one or more flashing cursors on the screen, and testing in software whether the blinking of the cursor is in sync with what the light pen sees, it is simple to set up multiple choice or menu driven programs. The light pen I tested did not have polarizing plugs on the user port connector, and the orientation of the connector always seemed "upsidedown" to me until I placed a "this side up" sticker on the back. Other than this oversight, it is a very well designed product, and one that adds a lot of enjoyment to the PET. Software which is written for use by this light pen is available from several sources. I found the programs written by Quill Software, 2512 Roblar Lane, Santa Clara, CA 95051 to be the best. The light pen is best suited for a multiple choice scenario, such as in the game of Swords and Sorcery, Hunt the Wumpus, or Othello. There are four tapes avilable from Quill, priced at about $20 each. I suggest you write them for a complete up-to-date list as new ones are made available regularly.

# The Programmer's Toolbox™
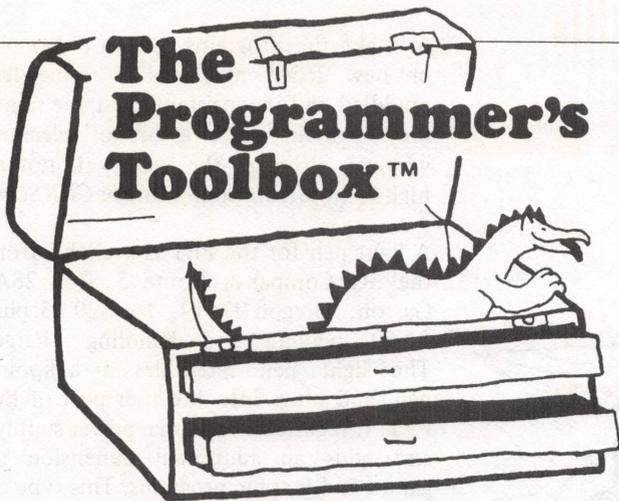
## BY EVERYBODY

In Vol. 1, No. 3 of *PC*, 1973, Marc LeBrun began a column that provided routines that could be used as part of a "toolbox" of computer skills. We revived that column in the May-June 1979 issue of *RC*.

Here are some more "tools" for the Toolbox. Hope you can use these new programs. If you have ideas for useful routines, write them down and send them to us. —RZ

---

## PT11: MENU SELECTOR

Here is a more elegant form of a "menu selector" than the usual "Enter the number of the function desired". This routine accepts any single character, compares it to an arbitrary list of characters, and returns with a number which corresponds to the matched character. The return value can be used in an ON . . . GOTO . . . statement. If there is no match, a nicely formatted list of the acceptable characters is printed. The routine accepts lower case letters. Written as a multiple line defined function in Northstar BASIC, the function can be easily converted to a simple subroutine or to other versions of BASIC.

```
1000 DEF FNI(B$)
1010   T=LEN(B$)
1020   I=0\A$=INCHAR$(0)\IF A$=CHR$(13) THEN 1140
1030   IF A$<" " THEN 1020 ELSE PRINT A$
1040   IF A$=>"a" THEN A$=CHR$(ASC(A$)-32)
1050   FOR I=1 TO T
1060     IF A$=B$(I,I) THEN EXIT 1150
1070   NEXT I
1080   PRINT "ENTER ONLY ",
1090   FOR I=1 TO T
1100     PRINT B$(I,I),
1110     IF I<T-1 THEN PRINT ", ",
1120     IF I=T-1 THEN PRINT " OR ",
1130   NEXT I\PRINT ": ",\GOTO 1020
1140   PRINT
1150   RETURN I+1
1160 FNEND
```

Line 1020 inputs the character and checks if it is a carriage return.
Line 1030 checks for control codes (which are accepted by the INCHAR$ function) and ignores them.
Line 1040 converts lower case letters to upper case.
Lines 1050 to 1070 check for a character match. Jumps to line 1150 if a match is found.

Lines 1080 to 1130 are reached only if no match was found. They print out a list of the acceptable characters.
Line 1140 is reached only if the input was a carriage return.
Line 1150 returns the value of this function: 1 if it is a carriage return, otherwise the number of the matched character + 1.

Finally, a few words on Northstar BASIC:

The \ is the statement separator, equivalent to : in other BASICs.
Line 1020: A$ = INCHAR$(0) puts the next key pressed into A$, it does not print it. It will accept control codes.
Lines 1060 and 1100: B$(I,I) gets the Ith character alone from B$. It is equivalent to MID$(B$, I, 1).
Line 1060: Northstar BASIC requires EXIT to prematurely terminate a FOR/NEXT loop. Other BASICs just use GOTO. The comma in PRINT statements is the same as a semicolon in other BASICs.

### BY LARRY HUDSON

---

## PT12: FACTORIAL ROUTINE

This function and the one following, in PT13, are two more Northstar BASIC routines. For a short and simple way to compute factorials, give this one a try. Refer to PT11 for information on how Northstar BASIC corresponds to a lot of standard BASICs. Warning: this routine is *recursive*—it calls itself in line 40!

```
10 REM FACTORIAL FUNCTION USING NORTHSTAR BASIC
20 DEF FNA(X)
30 IF X>1 THEN 40 ELSE Y=1\RETURN Y
40 Y=FNA(X-1)*X
50 RETURN Y
60 FNEND
70 INPUT X\PRINT #1,X,"!= ",FNA(X)
80 END
  1!=   1
  5!=   120
  10!=  3628800
  20!=  2.432902E+18
  49!=  6.082818E+62
```

### BY R.BLESSING

---

## PT 13: ACKERMANN'S FUNCTION

For those of you with a need to compute a complex function that requires a routine to call upon itself, here is a fine example. In lines 40 and 50, the function calls itself to continue the calculations. Line 50 is especially interesting. Some BASICs may not handle this kind of *recursive* operation, so programmers beware!

```
10 REM ACKERMANN'S FUNCTION USING NORTHSTAR BASIC
20 DEF FNA(A1,A2)
30 IF A2<>0 THEN 40 ELSE Y=A1+1\RETURN Y
40 IF A1<>0 THEN 50 ELSE Y=FNA(1,(A2-1))\RETURN Y
50 Y=FNA((FNA((A1-1),A2)),A2-1)
60 RETURN Y
70 FNEND
80 INPUT "A1 & A2 ",A1,A2\PRINT #1,"A1= ",A1," A2= ",A2
90 !=1\!=1
100 FOR I=0 TO A2
110 FOR J=0 TO A1
120 PRINT #1,TAB(J*6),FNA(J,I),
130 NEXT J
140 PRINT #1
150 NEXT I
160 END

A1=  9  A2=  3

1    2    3    4    5    6    7    8    9    10
2    3    4    5    6    7    8    9    10   11
3    5    7    9    11   13   15   17   19   21
5    13   29   61   125  253
```

### BY R. BLESSING

---