BEST OF THE PET® GAZETTE

PET® is trademark of Commodore Business Machines. The PET GAZETTE is not connected in any way with them. We learn everything the hard way.

The PET GAZETTE will continue in 1979 to be YOUR magazine. Still FREE (donations appreciated). In order to continue we need articles from YOU!! Please send them typed, single spaced, ready for printing.

Sorry, but our Software/Hardware Listing was delayed. Our first 1979 issue will feature it.

We are happy that MANY PET users are now WISE buyers who buy ONLY products they have seen reviewed.

Companies—we do reviews FREE of charge. Send us your products for review. We do NOT return products sent to us.

We apologize to any company who was left out after sending us a product for review. We have many people doing product reviews. Some never turned in their reviews.

NOTE: Reviews and articles are strictly opinion. We will print opposing reviews or articles if you send them to us, well done. Short articles as on pg 1 are based on comments we have received, which are also opinion.

Information and programs are provided ONLY as ideas. We are not responsible for their correctness. Use this entire book at your own risk. (PS, it all should be just fine.)

We forgot to list the programs included in each PAK (see pg 96). EDUCATIONAL: Morse Code, Math Drill, Story Problems, Capitols, Spelling Test, Speed Reading. GAMES: Mastermind, Acey Deucy, Pet Pong, Battleship, Football, Baseball. MUSIC: Pet Organ, Joplin Clock, William Tell, Star Wars Theme, Java, On Wisconsin, Misc. Music. USEFUL: File Manager 3, Easy Reader, Typewriter 6A, Digital Clock, Biorhythm, Case Converter. DEMO: Kaleidescope, Computer Art, Maze and Runner (or ON GOSUB Demo), Data Entry Demo (3 programs). UTILITIES: Renumber (including GOTO, GOSUB, IF THEN), No LIST, Auto Line Eraser, Auto Line numberer, and two more. BEST OF PAK 1: Morse Code, Star Wars Music, Biorhythm, No LIST, Utility Demo, Battleship, Kaleidescope.

Now that the PET GAZETTE is a magazine (still free) we are looking forward to a good year in 1979.

CONTENTS

Warning 1
Standards 2
Good Guy Awards 4
Resources 8
Letters 10, 14, 47, 54, 55
Pet Hints 20, 26, 32, 78, 79
Machine Language 24, 71
Music Convention 26, 34, 36
Data Files 38
Joysticks 42
On Goto 45
Info Summary 50
PET Clubs 54
Program Overlays 56
Program Protection 60
PET pouri 61, 62, 66
Memory Map 70, 88
Basic Abreviations 71
PET Symbol Table & Data Format 74
Decoder 76
Dynamic Keyboard 80
Tape Hints 83
Microsette 85
PET Cassette Exchange 93
Free Sottware 95

PROGRAM LISTINGS

Auto Line Eraser—Lindsay 68
Auto Line Eraser (Annotated)—Lindsay 68
Auto Line Number—Lindsay/Weiler 63
Automatic Line Numbering—Mellissa 75
Case Converter—Weiler 81
File Manager 3—Cumberton 28
5"PI" FIND/CORRECT/SELF-ERASE—Lindsay 60
Hex Data Read Routine 71
Keyboard Buffer Display—Irving 14
Mem Explorer/Decorder—Busdiecker 77
No-List Demo—Lindsay 60
ON GOSUB Example—Lindsay 64
Password—Sosnowski 16
Patterns—Wuchter 24
Plot 72
Print Screen Contents 72
Renumber 60
Repeat Key Routine—Software Shoppe 30
Sound Input Routine—Lindsay 24
Taps (Music)—Adams 16

ADVERTISERS INDEX

Axeco 46
Blosystems Research 65
Calculators/Computers 23
CGRS Microtech 31
Channel Data 3
Computer Mart Systems 37
Computhink 48, 49
Connecticut Microcomputer 5, 58, 59
Dr Daley 35
Excel 33
Forethought 69
George Risk Industries 11
International Technical Systems 27
Jamestown Small Computer Systems ..... Inside Back Cover
Madison Computer Store 90
M & E Associates 15
Micro Computer Industries 45
NCE/Compumart 17
Nestar 21
New England Electronics 7
Osborne & Associates 9
Pacific Data Products 65
Paper ..... 82, Back Cover
Petshack 39
Program Design 13
Reich Engineering 25
Sawyer Software 19
Skyles Electronic Works 91, 92
Software Shoppe 69
Total Information Service 86
ZZYP Data Processing 29

REVIEWS

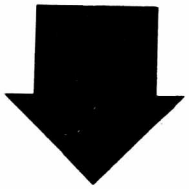
Accounting Pack 1—Sawyer Software 46
Add 'em Up—Jamestown Small Computer Sys 40
Anti Aircraft—New England Electronics 40
Asteroid—ZZYP Data Processing 36
Baccarat—CMS 41
Baseball—Brinson 88
Betsi—Forethought Products 50
Big KB Keyboard—Skyles Electronic Works 38
Big KB Memory—Skyles Electronic Works 38
Billboard—Micro Sottware Systems 89
Black Bart (Poker)—ZZYP Data Processing 41
Black Box—Dr. Daley 88
Black Bret (Blackjack)—ZZYP Data Processing 41
Blackjack—CMS 41
Blackjack—JK Johnson 41
Block—ZZYP Data Processing 87
Bombadier—New England Electronics 40
Budget—Petshack 86
Cassette Tapes—Dr. Daley 8
Cassette Tapes—Full Compass 85
Cassette Tapes—Microsette 85
Cassette Tapes—Pyramid Data 85
Channel Data Book—Channel Data Systems 87
Chase—Dr. Daley 84
Checkers—CMS 87
Checking Account—Computers One 82
Check Management—Jamestown Small Computer Systems 40
Chessboard—Sawyer Software 87
Commodore PET User Club Newsletter (England) 24, 55
Computer Derby—Petshack 47
Computone—Microsignal 36
Craps—CMS 41
Cursor 6, 66
Depth Charge—New England Electronics 40
Dictator—Dr. Daley 50
Dogfight—New England Electronics 40
Extended Graphics—Software Shoppe 66
Football—ZZYP Data Processing 87
Football 2—Dr. Daley 12
General Ledger—Computers One 82
Gomoku—CMS 12
Hangman—YP Data Processing 86
Hangman—Mike Richter 67
Huntwriter—Mike Richter 67
Iron Planet—ZZYP Data Processing 84
Joysticks—Coyote Electronics 43
Joysticks—Microtronix 42
Keyboard—Excel 87
Kingdom—Personal Software 47
Kites—AB Computers 89
Legal Diary—Computers One 82
LEM Landing trom Moon Orbit—Alpha Omega Software 53
Life—Smith Business Services 46
Matador—Personal Software 95
Math Tutor—Petshack 47
Maxit—H. Saal 55
Medit—Total Information Service 86
Metric-Calc—Micro Software Systems 87
Microchess—Personal Software 40
Micro Set 1—Micro Software Systems 66
Missle—Software Industries 36
Monitor—Petshack 55
Monitor—Smith Business 55
Morse Code—Dr. Daley 36
Music Box—New England Electronics 36
Numberama—Petshack 41
One Queen—Personal Software 95
Petable—Program/Petable 63
PET Data Sheets—Alcorn Data Service 50
PET Dust Cover—New England Electronics 6
Petforth—Programma Consultants 46
PET Info Packet—New England Electronics 16
PET Tutor—Paper 50
PET Workbooks—Total Information Service 82
Poker—Personal Sottware 41
Practical Computing 55
Printer Adapter—Connecticut Microcomputer 8
Program—Program/Petable 66
Purser Cassette Reference List—Purser 34
Ouest—Computer Project 67
Ouibic—CMS 12
Read, Write PET Memory—Ketchum 16
Rent Accounts—Computers One 82
Roullette—CMS 41
Schedule Planner—Sawyer Software 54
Sharks—Reich Engineering 64
6502 Disassembler & PEEK—Petshack 55
Slot Machine—Reich Engineering 64
Some Common Basic Programs—Osborne & Assoc 54
Star Fighter—ZZYP Data Processing 36
Startrek—Petshack 84
Startrek—Dad's Reliable Software 84
Startrek—Smith Business Services 84
Startrek—Dr. Daley 84
Starwars—Software Industries 36
Swee-Ping—Micro Sottware Systems 47, 89
Swordquest—Fantasy Software Games 67
TNW 488/103 Low Speed Modern—Networks 6
TNW 488/232 Serial Interface Module—Networks 6
Traverse & Curve/Intersect—A H McCann 12
Trust Accounts—Computers One 82
Video Checkers—Compu Ouote 12
Word Processor Program—Connicticut Microcomputer 46
Wumpus—PET Cassette Exchange 66
ZZAPP—Dr. Daley 84

Well, here it is -- the BEST of the PET GAZETTE. We tried to squeeze as much as we could into this one issue. (Better than full size type with wide margins, right??). We have lots and lots of reviews. Make sure you remember that the reviews are one persons opinion. But regardless -- if it is reviewed you KNOW that it exists. Now that everybody and his brother is selling PET software, I kind of wonder about the programs we don't get to review. Maybe they are not sending them to be reviewed because the program is not that good. (OR does NOT even exist). For example, Commodore sure took an AWFUL long time to deliver their programs. Also, not to pick them out, but as an example, MICROTRONIX has been advertising quite a few programs and accessories for the PET for some time now. I wonder how many really exist. For example the printer with PET graphics. They promised to send me a printout showing the graphics as soon as they had it perfected. That was several months ago and needless to say I haven't seen them. Plus they mad a big thing out of their CHESS program with joystick imput - pictured in one of their main ads. Please note the reprint from last issue concerning that program. They cashed our check for that CHESS program well over a month ago and also cashed our separate check for the exorbitant shipping charges. We have yet to get even a postcard from them. Now you see why we constantly warn you:

NEVER ORDER ANYTHING UNLESS YOU ARE SURE IT EXISTS ! ! ! !

IF IT IS REVIEWED IN THE PET GAZETTE YOU CAN BE SURE IT EXISTS ! ! ! !

We only ordered the CHESS program from MICROTRONIX because we doubted that it existed and wanted to verify that doubt. Since we have not received it yet that speaks for itself. Plus what about our check they cashed.??? I talked to someone on the phone just the other day who said he saw the MICROTRONIX exhibit at a computer show. He asked them where their CHESS program was, with the joystick input. Their representative told him that there was no such program. Anyhow, please heed our warning -- there are many companies who would love to collect your money, use it for their research and development, and then if all goes well, send you what you ordered in a few months. If all goes well that is!!!



We are giving MICROTRONIX a double take. There supposedly are threatened law suits if anything is printed, so being cautious I will mention some things. 1)Their joysticks as sent to us were definately used, nicks and all. 2)Close to three months ago, Mr. Aiken of Microtronix called and said they were going to send me their fantastic chess program. About 3 weeks ago Mr Aiken again called me. When asked he said he would send the chess program right away. We still don't have it. Mike Sawyer of Sawyer Software has called me several times concerning that chess program. According to Mike Several months ago he sent Microtronix his CHESS program, inquiring if they would like to be a distributor for it. He said that after a LONG time they told him NO but now are selling a program using graphics that look VERY MUCH like his. Since they are not giving him any royalties it appears suspicious. However the listings must be compared before we will know for sure. But Microtronix seems to be stalling. Neither Mike nor us can get a copy of their Chess program. Maybe they are trying to come up with their own code before sending out copies. We HAVE ordered the Chess program from Microtronix and thus have the right to use it. So, if anyone has received Microtonix's Chess program PLEASE send us a copy. It will be used only to compare listings (we have Personal Softwares Microchess 2.0 and love it). We can send you a couple programs from our exchange for your trouble. 3) Also, about 3 months ago when Mr. Aiken called, he told me that within a couple days they would have the Integral Data printer printing full PET graphics and lower case. 3 weeks ago he told me that they were still working on it. Today (OCT 19) we have NOT heard that it is working yet. Thus with these suspicions, we would really appreciate hearing from anyone who has dealt with Microtronix. Send us your comments, good and bad.

Warning On Heath Accessories

FROM: ACG-NJ NEWS

If you have a Heath H-8 system, you are probably in the market for software for your system. You will also, no doubt, come across many ads in the national publications for H-8 software from companies.

One H-8 owner, Ted Stowe, ran across an ad and sent a money order to the company for software he would like to have run on his H-8 system. That was last year and to date the only thing he has received from the company is the letter which appears on the right. It seems as if the company is selling an idea for a product, and if it gets enough orders for it, it writes it. Although they state in their letter that they will make a refund if you don't wish to wait, most customers become disgruntled at this type of company operation. Ted would like to have the software, or he wouldn't have sent for it in the first place, but all he can do now, besides wait, is to let others in on his dealings with this company. It took Ted 3 months to get this letter from them. Tom Williams, of Dr. Dobb's Journal, has also been trying to contact this company, but so far without success.

Ted also has ordered some extender and prototyping boards for his system from a company called Seletron. The extender board is poorly designed, so if it is plugged into the system, it will short out. The boards from this company come without the metal supports and other hardware which make it impossible to mount the boards. The prototype board also came undrilled, which was explained done to keep down costs. If the metal support were mounted on the board, it would short out the +5 V and ground lines. In calling Seletron you may also get the switchboard for Mini Micro Mart, who is also selling the same products for the same prices. If you call Mini Micro Mart, they can switch you over to Seletron's phones instantly. Ted had sent back one of these boards months ago, which they were going to exchange for a different product and has not received anything yet.

Multi-Micro Media
CORPORATION
P.O. Box 1025
Arvada, Colorado 80001
(303) 425-5221

TO ALL MULTI-MICRO MEDIA CUSTOMERS:

Thank you for your order. It is most appreciated.

The purpose of this letter is two-fold: to acknowledge your order and to explain when, if ever, you can expect to receive it.

At present we have not received sufficient orders for some of the products to make it economically feasible to produce them at this time. The schedule below is our best guess as to when the order level will warrant producing the most minimal quantities for shipping.

PRODUCT	FORECAST	PROBABLE SHIPPING DATE
H8-BG1	Unclassifiable	Unknown
H8-BG2	Unclassifiable	Unknown
H8-MC1	Unclassifiable	Unknown
H8-MG2	Unclassifiable	Unknown
H8-MG3	Unclassifiable	Unknown
H8-MG4	Poor	July 1
H8-CODE	Unclassifiable	Unknown
H8-KING	Unclassifiable	Unknown
H8-DISM	Good	June 15
H8-EDUC	Good	June 1
R8-BG1	Excellent	May 1
R8-BG2	Very Good	May 15

As of May 1, 1978, we intend to re-evaluate the status of ALL orders for ALL products. At that time, any product whose forecast is still "Unclassifiable" will be cancelled and the orders for that product will be returned.

In the meantime, anyone who wishes to cancel an order is invited to do so. We will return your original order document and if payment was rendered by check, we will return your check. In the case of money orders made payable to Multi-Micro Media Corp., we will write a refund check for the same amount back to you.

Unless advised to the contrary, products will be shipped when produced and for credit card customers, you will be billed one at a time. In the case of orders for a combination of produced as well as cancelled products paid by check or money order, an appropriate refund will accompany the first product shipped.

Again, thank you for your order. We, like you, hope that interest will increase in our product line to make it possible to bring to you what we feel are good products. Your patience during this trial-time is appreciated very much.

Sincerely,

MULTI-MICRO MEDIA CORPORATION
Operations Department

H-E-L-P

Our Center has a very good and nearly complete collection of computing magazines. We are missing the first two Volumes of Creative Computing and a couple early issues of Peoples Computer Company. Please contact us if you have any and would part with them for some free programs (or even money).

Please forgive us if we left anyone out. Write and tell us so next issue will include you.

PET STANDARDS

To be able to exchange programs and listings that are fully compatibl and easily understood we hope you will follow these standards. (these are conventions and guidelines)

1) Start your program with line 100.

Starting with line 100 serves two purposes. It allows 100 free lines for identification and useful routines. It also will allow a user an easy way to return to a program in case he/she jumps out of the program accidentally. (by hitting return with no data for an input statement etc) The user would simply type in GOTO 100 and would be back in the program.

2) Identify the program.

Use lines 10-19 for identification purposes. A suggested format is:
```
10 PRINT "PROGRAM NAME"
12 PRINT "AUTHOR - DATE"
14 PRINT "LIST THE BOOK OR MAGAZINE TAKEN FROM, IF ANY
16 PRINT "MEMORY NEEDED __K"
```

3) Include instructions as part of the program.

Instructions on paper are great, but may get lost. Best to have both but do make sure enough instructions are part of the program so that it will be useful without the written instructions.

4) ALLOW the User to read your identification/instructions.

Include a routine such as the following:
```
40 PRINT "HIT ANY KEY TO CONTINUE"
42 GET A$:IF A$="" THEN GOTO 42
```
As soon as any key is pressed the program will continue.

5) Put the PET into the correct mode (Graphics or lower case)

Don't assume that the PET will be in the graphics mode. Always start your program by using one of the following (which ever is correct for your application)
```
50 POKE 59468, 12:REM GRAPHICS
    or
50 POKE 59468,14: REM lower case
```

6) Clear the screen before starting.

Use a line such as:
```
60 PRINT"(CLR)":REM CLEAR SCREEN
```

7) Include documentation within your program itself.

Include alot of REMarks in your program. It will really help the next person understand what is going on. (You will be surprised how much it will help you with your own programs)

8) Use lower case whenever you have alot of text to display.

It is much easier to read a screen of text in lower case rather than all capital letters. The user will appreciate reading lower case (and will be impressed with your good programming)

9) Label each subroutine or main section of the program.

To make it easy to spot the beginning of each section of your program begin with a line with alot of asterisks (*) such as:
```
430 REM ********** PRINT THE HUGE LETTER **********
```

10) Use line numbers increasing by 10 each new line.

Later on you may want to add a line or two and by leaving 9 lines in between every 2 program lines you allow for future additions.

11) Indent each FOR...NEXT loop

This is a good programming technique. Remember that the PET erases extra spaces between the line number and the beginning of your statement. To be able to indent simply use colons (:). Example:
```
560 REM ********** SHOW ADDITION WITH THE SUM **********
570 FOR A=1 TO 4:REM Loop for the first number
580 :FOR B=1 TO 6:REM Loop for the second number
590 ::PRINT A;" PLUS ";B;" EQUALS ";A+B
600 ::PRINT : REM print one blank line
610 :NEXT B:REM Next second number
620 NEXT A:REM Next first number
```

By indenting, as above, you can see if you end every loop, and in the correct order. To use this method just indent 1 space for each FOR used and continue this until you encounter the NEXT. Don't indent that space on the NEXT line. You are indenting ONE space INSIDE each for next loop.
Did you notice how the REMarks let know exactly what was happening in the program??? Get into the good habit of using remarks.

CONVENTIONS FOR LISTING GRAPHIC AND SPECIAL KEYS

We believe that the conventions proposed by PEOPLES COMPUTERS magazine are very good. They require no memorization of special symbols and can be typed on a normal typwriter without backspacing to "double stike" such as ∅ takes two stokes, one capital S and a backspace to stike the /. We should all agree on something NOW before everyone does it different and everyone gets confused.

12) Use key cap identifiers if possible.

By using the letter/letters printed on the key there is nothing to memorize.

13) Use CAPITAL letters and enclose them in square brackets.

This method allows each to be typed with any typewriter or printer. Use regular parenthesis if square brackets are not available.

14) Use a number before an item to tell how many times it should be repeated.

This saves alot of typing. Keep the number inside the brackets also.

15) Enclose consecutive special keys within the same brackets separated by commas.

This is much easier to read and eliminates typing brackets all the time.

16) For graphics use the letter on the key enclosed in brackets.

If you see a letter inside brackets it means shift and hit that key. (S) means shift and hit S which gives you a heart.

17) Use REMark statements to include these conventions within the program itself.

First enter the line just as you normally would. Then immediately following it (or the next line) have a REMark and list the special parts of the line using the conventions specified above. Your program will then run correctly and can be listed on a printer and be easily interpreted. Anyone else using your program will then be able to run through a listing and understand what keys you are using to get the results he/she sees.

***See Peoples Computers, Jan. 78, page 17 for further information.

Example:
```
230 ?"(HOME, 3DOWN,S)"
```
You type 2 3 0 ? " the HOME key CURSOR DOWN 3 times shift S "

Personal Ledger

Channel Data Systems' Personal Ledger is a complete double entry bookkeeping system with provisions for budgeting and keeping records of income, deductible and non-deductible expenses, assets and liabilities. Its simple interactive features enable entering transactions, adding or editing accounts, and printing of a detailed Income Statement and Balance Sheet. Users completely unfamiliar with computerized accounting and with little or no knowledge of bookkeeping can use the system.

Up to 50 accounts are allowed with names and budgets specified by the user. An audit trail of all entered transactions is printed on the printer of your choice or on the screen if you do not have a printer. All account data is stored on cassette, loaded prior to entering transactions and stored after entering transactions. There is no waiting for printing to the tape during operation of the system. Extensive error recovery features are included to allow reentry of an erroneous instruction or value.

The Personal Ledger runs in 8K bytes of free RAM on Commodore's PET and 16K bytes on Radio Shack's TRS-80 Level II. PET BASIC is a version of Microsoft BASIC which can be translated to most other BASIC systems with minimum modifications.

Personal Ledger is supplied on cassette in Commodore PET or TRS-80 Level II format (Please specify) and includes a complete manual with a program listing, flow charts, sample data, and complete operating instructions. All for only $20.00 (Calif. residents please add 6% sales tax) by Channel Data Systems.

ORDERS: Check, money order or VISA/Master Charge accepted; programs and cassetes guaranteed and shipped within five days after receiving your order. VISA/MC telephone orders welcome at (805) 964-6695.

REMEMBER: Specify **TRS-80** or **PET** when ordering **PERSONAL LEDGER**

Channel Data Systems

5960 MANDARIN AVENUE · GOLETA, CA 93017 805·964·6695

The Channel Data Book

Channel Data Systems is publishing a comprehensive hardware/software reference service for users of the Commodore PET personal computer. **The Channel Data Book** is a user-oriented directory of PET-related products including:

>Software
>Hardware and Peripherals
>Literature and Periodicals of special interest to PET users
>Listings of user groups and distributors
>Cross references by product type and supplier

Designed as a personalized working tool, **The Channel Data Book** provides a complete reference service for PET-related products, plus convenient dividers and color coding to organize programs, articles, and newsletters of specific interest to each user. Special sections for filing correspondence you have received from Commodore and flyers from other product suppliers are also provided. Flyers from suppliers of PET-related products who elect to advertise in the Data Book will be included in product sections. Venders that market PET-related products or services should be sure to contact CDS, as a summary of the information will be included at no cost.

The Data Book includes an attractive 3-ring binder and updated supplements with easy to follow instructions for filing new and revised material. The low price of $20.00 includes **The Channel Data Book** and update service through calendar year 1979. California residents please add 6% sales tax. Order now from Channel Data Systems.

ORDERS: Check, money order or VISA/Master Charge accepted; Satisfaction Guaranteed. VISA/MC telephone orders welcome at (805) 964-6695.

Channel Data Systems

5960 MANDARIN AVENUE · GOLETA, CA 93017 805·964·6695

BITS & PIECES — INPUT VS GET

If your program asks the user for an answer, try to make it as easy as possible for the user. Don't make him type in Y E S when Y would suffice. And use the GET command for all one letter or one digit answers. (ie don't use INPUT) Example:

```
220 PRINT"Would you like to go first?";
230 GET A$:IF A$="" THEN GOTO 230
240 PRINT A$:IF A$<> "Y" THEN goto the section where the PET goes 1st.
```

It is possible to use the GET command and then create your own blinking cursor. I would recommend that if you do this to NOT use the black/white box. That is used for the regular cursor. If you use it when a RETURN is not needed after your answer, then people will get confused. DO USE a blinking gray box. That works very well, and the user would know, if he sees a blinking white box he must hit return after his answer, if he sees a blinking gray box he doesn't need to.

HIT VS TYPE

How do you ask the user to hit a special key so that he does'nt type in the word as a series of letters?

You might try using the word PRESS to mean it requires only one key. Then you could use TYPE or an equivalent to mean several letters.

```
250 PRINT"PRESS 'STOP' TO END THE DISPLAY"
or
350 PRINT"TYPE R U N TO START THE GAME"
```

USER CONTROLED MOVEMENT IN THE GAME

Any games that have the user control the movement of pieces -- PLEASE use the standard method.

```
7  8  9
4  5  6      5=STOP MOVEMENT
1  2  3
```

If two players play at the same time, use the above for controls for the right side player. Use the same principle for the left side player with:

```
Q  W  E
A  S  D      S=STOP MOVEMENT
Z  X  C
```

In your instructions at the beginning, draw a picture of the above diagram. It is easy for the user to understand it this way.

KEYBOARD MEMORY BUFFER

The PET can remember what you typed even while it is doing something else. Thus you can answer an INPUT question even before it is asked. This is good and bad. Good because if you know that it is going to ask for your bet, you can type in 1 0 0 'RETURN' before the question is asked and speed things up. It is bad however because someone might hit a key or two while waiting for the computer to ask the next question. There is a way to clear the memory buffer before your INPUT request. Try POKING a 0 into 525, or monkey around with locations 526-534 (This is the keyboard buffer) Write a short note for us if you figure it out.

Robert Purser

PO BOX 466, EL DORADO, CA 95623

GOOD GUY AWARDS

As you may have guessed, we get to know most of the PET companies through our correspondence with them and most importantly from comments from our many loyal readers. Bob Crowell of New England Electronics is aquiring a good reputation for good service and helpfulness. Ron Jeffries of CURSOR is trying to get GOOD, low cost software to you. If your tape doesn't load, they replace it free and refund your postage costs to return it. Robert Elliott Purser is trying to compile a list of all software available for the PET, Apple, and TRS-80. He likes the PET best. Mike Sawyer is putting out some good business programs. Each tape sold is individually recorded, verified, loaded, and run to assure you of a good tape. Of course a replacement is sent if you can't load the program.

CURSOR™
Programs for PET™ Computers
P.O. Box 550 Goleta, California 93017

SAWYER SOFTWARE
828 Lewis, Rt. #3
Dexter, Mo. 63841
314-624-7611
SAWYER SOFTWARE

P.E.T.™ PRODUCTS

NEECO now has many products available for your Commodore P.E.T.—We invite software authors to contact us concerning our 25% Royalty Program.

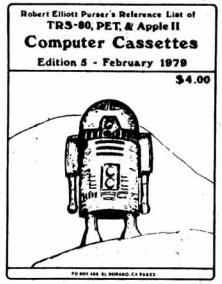
SOFTWARE: Too many programs to list here! Call NEECO and ask us to send you our free Software/Hardware Products Directory!

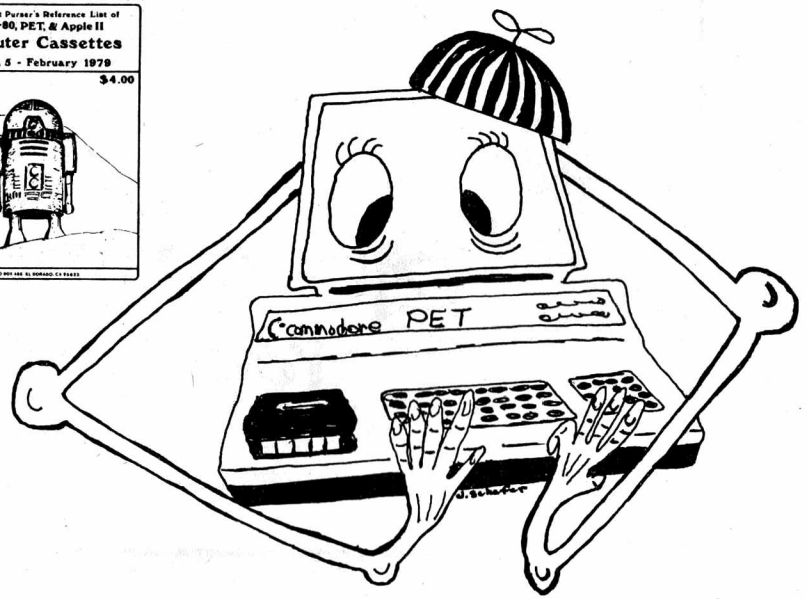
THE MUSIC BOX™: Music composer and sound effects generator. Allows you to compose and hear music on your P.E.T.—Program/Hardware allows you to display notes, *HEAR* the notes, save pages of music on tape for playback later, much more! The **MUSIC BOX™** displays the notes as a song is played!—Allows you to add sound effects to your own programs!—Endless possibilities!—All cassette software, plug-in hardware and **MUSIC BOX™** instruction book for only $49.95!—**MUSIC BOX™** fits right inside your P.E.T.!—No assembly required at all!

DUST COVER: PROTECT YOUR PET! Cover your P.E.T.'s delicate circuitry and keyboard from dust and spills! Heavy, clear vinyl plastic cover shows off your P.E.T. while protecting it from dust and unwanted sticky fingers! ONLY $17.95

VISA OR MASTERCHARGE Phone Orders Accepted!(+4%)

NEW ENGLAND ELECTRONICS CO.
248 Bridge Street, Springfield MA 01103
(413) 739-9626
"Authorized Sales & Service on the Commodore P.E.T.™ Computer"

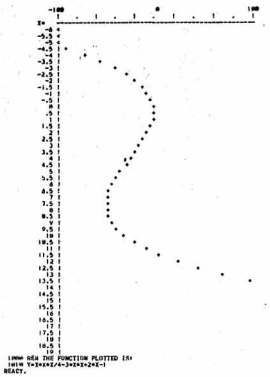




PET prints

COMMODORE PET HARD COPY OUTPUT USING PET ADA 1200

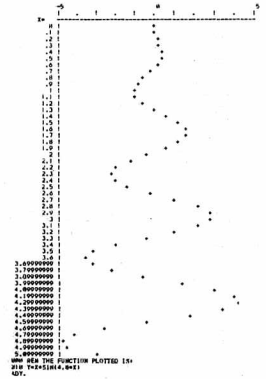
BEST OF THE PET GAZETTE / Page 5

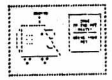


```
 1 OPEN 4,8:CMD 4:LIST
10 REM ARCSIN AND ARCCOS FUNCTIONS FOR THE COMMODORE PET
20 REM WRITTEN BY RICHARD HOWDEN
30 REM            CONNECTICUT microCOMPUTER
40 REM            150 POCONO ROAD
50 REM            BROOKFIELD, CT 06804
60 REM
70 REM *Listed on a GE TermiNet 300
80 REM *using a CmC ADA 1200.
90 REM
100 REM OPEN OUTPUT FILE ON DEVICE #8.
110 OPEN 5,8
120 REM
500 REM GET A SINE VALUE
510 INPUT S
520 C=S
530 REM
1000 REM THE SINE OF THE ANGLE IS S
1010 REM IF THE SIN IS IN THE RANGE OF -1 TO 1, THEN COMPUTE.
1020 IF S<1 AND S>-1 GOTO 1050
1030 AS=99:GOTO2000
1040 REM THE ARCSINE IS AS
1050 AS=ATN(S/(1-S*S)^.5)
1060 REM THE RESULT IS IN RADIANS. CONVERT TO DEGREES.
1070 AS=AS*180/
2000 REM THE COSINE OF THE ANGLE IS C
2010 REM IF THE COSINE IS IN THE RANGE OF -1 TO 1,
2011 REM       AND NOT = TO 0, THEN COMPUTE
2020 IF C<>0 THEN 2040
2030 AC=99:GOTO 3000
2040 IF C<1 AND C>-1 THEN 2070
2050 AC=0:GOTO 3000
2060 REM THE ARCCOS IS AC
2070 AC=ATN(1-C*C)^.5/C)
2080 REM THE RESULT IS IN RADIANS. CONVERT TO DEGREES.
2090 AC=AC*180/
3000 PRINT#5," SIN,COS      ARCSIN      ARCCOS"
3010 PRINT#5,.5,1
3020 FOR N=1 TO 13-LEN(STR$(1)):PRINT#5," ";:NEXT
3030 PRINT#5,AS1
3040 FOR N=1 TO 13-LEN(STR$(AS)):PRINT#5," ";:NEXT
3050 PRINT#5,AC
3100 GOTO 500
READY.
```

```
SIN,COS      ARCSIN      ARCCOS
.1           5.73917448  84.2608206
SIN,COS      ARCSIN      ARCCOS
.2           11.536959   78.463041
SIN,COS      ARCSIN      ARCCOS
.3           17.4576831  72.5423069
SIN,COS      ARCSIN      ARCCOS
.3333333     19.4712244  70.5287706
SIN,COS      ARCSIN      ARCCOS
.4           23.5701785  66.4218216
SIN,COS      ARCSIN      ARCCOS
.5           30          60
SIN,COS      ARCSIN      ARCCOS
.6           36.8699977  53.1301824
SIN,COS      ARCSIN      ARCCOS
.7           44.427894   45.572996
SIN,COS      ARCSIN      ARCCOS
.7259182     46.5446835  43.4553965
SIN,COS      ARCSIN      ARCCOS
.8           53.1301824  36.8698977
SIN,COS      ARCSIN      ARCCOS
.9           64.1580673  25.8419328
SIN,COS      ARCSIN      ARCCOS
.999999      89.9180618  .081382363
```

```
 X          Y
 0          0
 .5         .33773159
 1          -.99016689
 1.5        1.1095818
 2          -.34680356
 2.5        -1.2614229
 3          2.4051042
 3.5        -1.9904662
 4          1.3235972
 4.5        -1.7156219
 5          +4.52789179
```





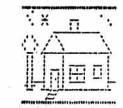
```
TRENDACK Sales - Carburetors - 1977

T 200 |                                                        ###
H     |                                                        ###
O     |                                                        ###
U     |  # TYPE C                                          ### 000
S     |                                                    ### 000
A     |  0 TYPE B                                  ###     ### 000
N 150 |                                            ### ### 000 000
D     |  X TYPE A                                  ### ### 000 000
S     |                                        ### 000 000 000 000
      |                                    ### 000 000 000 000 XXX
0 100 |                                ### 000 000 000 XXX XXX XXX
F     |                            ### 000 000 000 XXX XXX XXX XXX
      |                        000 000 000 XXX XXX XXX XXX XXX XXX
U     |                    ### ### 000 000 XXX XXX XXX XXX XXX XXX
M     |                ### ### ### 000 000 XXX XXX XXX XXX XXX XXX
I  50 |            ### ### ### 000 000 XXX XXX XXX XXX XXX XXX XXX
T     |        000 000 000 000 XXX XXX XXX XXX XXX XXX XXX XXX XXX
S     |    XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX
      |XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX
      +-----------------------------------------------------------
       JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
```

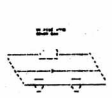
Powers of X

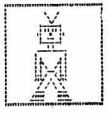
X	X^2	X^3	X^PI	X^5.25	X^.5
5#	25##	125###	217586.221	830083735	7.07106781
10#	100##	1000###	1919487.58	3.16227367E+10	10
15#	225##	3375###	6861877.28	2.65753572E+11	12.2474487
20#	400##	8000###	16039435.3	1.29339299E+12	14.1421356
25#	625##	15625###	34146855.2	3.80315787E+12	15.8113883
30#	900##	27000###	69548854.8	1.01131532E+13	17.3205081
35#	1225##	42875###	98271922.8	2.21173273E+13	18.7082869
40#	1600##	64000###	14949141	4.57946723E+13	20
45#	2025##	91125###	216427747	8.49895295E+13	21.2132034
50#	2500##	125000###	381345248	1.47772127E+14	22.3606798
55#	3025##	166375###	496549888	2.43727208E+14	23.4520788
60#	3600##	216000###	534342381	3.84852281E+14	24.4948974
65#	4225##	274625###	687112634	5.95861722E+14	25.4950976
70#	4900##	343000###	867239597	8.64490843E+14	26.4575131
75#	5625##	421875###	1.07713708E+09	1.24185712E+15	27.3861279
80#	6400##	512000###	1.31924716E+09	1.74260952E+15	28.2842713
85#	7225##	614125###	1.59069272E+09	2.39579338E+15	29.1547595
90#	8100##	729000###	1.98097987E+09	3.23424693E+15	30
95#	9025##	857375###	2.26257349E+09	4.29540482E+15	30.8227?
100#	10000##	1E+06	2.65936596E+09	5.62341327E+15	31.6227766

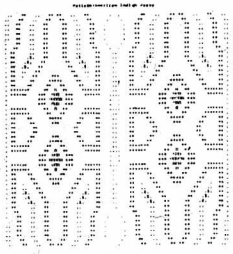
Powers of X

X	X^2	X^3	X^PI	X^5.25	X^.5
5#	25##	125###	217586.221	830083735	7.07106781
10#	100##	1000###	1919487.58	3.16227367E+10	10
15#	225##	3375###	6861877.28	2.65753572E+11	12.2474487
20#	400##	8000###	16039435.3	1.29339299E+12	14.1421356
25#	625##	15625###	34146855.2	3.80315787E+12	15.8113883
30#	900##	27000###	69548854.8	1.01131532E+13	17.3205081
35#	1225##	42875###	98271922.8	2.21173273E+13	18.7082869
40#	1600##	64000###	14949141	4.57946723E+13	20
45#	2025##	91125###	216427747	8.49895295E+13	21.2132034
50#	2500##	125000###	381345248	1.47772127E+14	22.3606798
55#	3025##	166375###	496549888	2.43727208E+14	23.4520788
60#	3600##	216000###	534342381	3.84852281E+14	24.4948974
65#	4225##	274625###	687112634	5.95861722E+14	25.4950976
70#	4900##	343000###	867239597	8.64490843E+14	26.4575131
75#	5625##	421875###	1.07713708E+09	1.24185712E+15	27.3861279
80#	6400##	512000###	1.31924716E+09	1.74260952E+15	28.2842713
85#	7225##	614125###	1.59069272E+09	2.39579338E+15	29.1547595
90#	8100##	729000###	1.98097987E+09	3.23424693E+15	30
95#	9025##	857375###	2.26257349E+09	4.29540482E+15	30.8227?
100#	10000##	1E+06	2.65936596E+09	5.62341327E+15	31.6227766









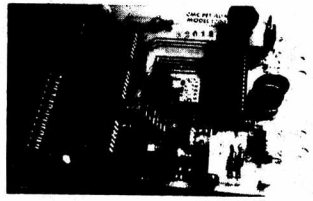
CONNECTICUT microCOMPUTER

150 POCONO RD. - BROOKFIELD, CT06804 - (203)775-9659

CONNECTICUT microCOMPUTER

150 POCONO ROAD - BROOKFIELD, CONNECTICUT 06804

(203) 775-9659



RS-232 PRINTER ADAPTER FOR THE COMMODORE PET

The CONNECTICUT microCOMPUTER ADApter model 1200 is the first in a line of peripheral adapters for the COMMODORE PET. The CmC ADA 1200 drives an RS-232 printer from the PET IEEE-488 bus. The CmC ADA 1200 allows the PET owner to obtain hard copy program listings, and to type letters, manuscripts, mailing labels, tables of data, pictures, invoices, graphs, checks, needlepoint patterns, etc., using a standard RS-232 printer.

The CmC ADA model 1200B comes assembled and tested, without power supplies, case, or RS-232 connector for $98.50. The CmC ADA 1200C comes complete for $169.00. Specify baud rate when ordering. (300 baud is supplied unless otherwise requested. Instructions for changing the baud rate are included.)

WORD PROCESSOR FOR THE COMMODORE PET

CONNECTICUT microCOMPUTER now has a word processor program for the COMMODORE PET. This program permits composing and printing letters, flyers, advertisements, manuscripts, articles, etc., using the COMMODORE PET and an RS-232 printer.

Script directives include line length, left margin, centering, and skip. Edit commands allow the user to insert lines, delete lines, move lines, change strings, save onto cassette, load from cassette, move up, move down, print and type.

The CmC Word Processor Program addresses an RS-232 printer through a CmC printer adapter.

The CmC Word Processor Program is available for $29.50.

RS-232 TO CURRENT LOOP/TTL ADAPTER

The CmC ADApter model 400 has two circuits. The first converts an RS-232 signal to a 20 ma current loop signal, and the second converts a 20 ma current loop signal to an RS-232 signal. With this device a computer's teletype port can be used to drive an RS-232 terminal, or vice versa, without modification of the port. The CmC ADA 400 can also be paralelled to drive a teletype or RS-232 printer while still using the computer's regular terminal. The CmC ADA 400 can easily be modified to become an RS-232 to TTL and TTL to RS-232 ADApter. The CmC ADA 400 does not alter the baud rate and uses standard power supplies. The current loop is isolated from the RS-232 signal by optoisolators.

The CmC ADA 400 is the perfect partner for KIM if you want to use an RS-232 terminal instead of a current loop teletype.

The CmC ADA 400S comes with drilled, plated through solder pads and sells for $24.50. The CmC ADA 400B comes with barrier strips and screw terminals and sells for $29.50.

This announcement was composed on a COMMODORE PET and printed on a GE TermiNet using a CmC ADA 1200C printer adapter and the CmC Word Processor Program.

Qnty	Description	baud rate	price	total
	CmC ADA 1200B (basic)		$98.50	
	CmC ADA 1200C (complete)		$169.00	
	CmC Word Processor Program (cassette)		$29.50	
	CmC ADA 400S (solder pads)		$24.50	
	CmC ADA 400B (barrier strips)		$29.50	
	Subtotal			
	Connecticut residents add 7% sales tax			
	Handling and shipping - add per order		$3.00	
	Foreign air mail - add $5.00 per order			
	Total included with order			

CHARGE TO: VISA MASTER CHARGE A/C INTERBANK NUMBER Expiration date

Credit card number

SIGNATURE

CONNECTICUT microCOMPUTER
150 Pocono Road, Room 7
Brookfield, Conn. 06804

NAME

COMPANY

ADDRESS

CITY STATE ZIP

REVIEWS
How to do one

In your review mention the favorable points of the product. If there are major drawbacks mention them. For programs, are they human engineered? Do they use GET commands for yes and no type answers? Is there any graphics used? Animation? Sound? (Is the sound abiding by our conventions?) When displaying a lot of text to read is it in lower case? Are the instructions clear and easy to understand?

Make sure to explain what the product does. (Does it do what was advertised?) For PET accesories, describe how easy it is to hook up or use. Are they safe around children? Also you could mention how good the service was. Any problems? Were the problems resolved? End with a sentence summing up your impression of the product.

Type your review. Make sure that it fits inside a 4 and 1/2 inch column. (Set your margins at 4 1/2 inches and don't go over that) Better yet, if you have access to use the Word Processor from Connecticut Microcomputer send us a tape with your review. We will then read it in and type out the review here. Send your review to:

PET Gazette
1929 Northport Dr.
Room 6
Madison, WI 53704

As a safeguard we will only print reviews for products we have seen/used ourselves. That is the only way we can be SURE the product exists. We don't want any part in promoting a non existent product.

Remember, just because a product is announced or advertised does NOT guaranty that it exists. If it is reviewed in the PET GAZETTE you can be sure it exists.

If you send us a review for a product we have not seen/used we will contact that company and advise them that we have your review, and will print it as soon as we verrify that the product exists.

We encourage people to send in a follow up review on a product previously reviewed. This second review will be by a different person with a different view. This is important, especially if you disagree with a review.

REVIEW
PET DUST COVER
$17.95
New England Electronics
248 Bridge St
Springfield, MA 01103

This beautiful dust cover is semi-transparent. It is shaped to snuggly cover the PET but allow you to still see it beneath. It prevents dust from getting in through the expansion ports. And since it is waterproof a spilled Coke will not give you heart failure.

After spending 800 bucks for your computer the least you can do is protect it while it is not in use.

REVIEW
TNW 488/232 Serial Interface Module
$240
The Net Works
5924 Quiet Slope Dr
San Diego, CA 92120

This is a bidirectional RS-232 module. It is also available as a dual channel module for $280. With this unit you can have input as well as output with your PET via the IEEE bus. The networks also includes an extra IEEE port slot so you can connect another IEEE device if you wish.

It comes with a thorough manual which includes schematics. They explain what is going on when you use this unit. AND they give software examples for your benefit. You can hook up any RS-232 peripheral to this unit. This includes printers, modems, keyboards, etc.

For an extra $35 you get an attractive case with decorative wood sides and a beautiful gold top. $20 will get you a complete set of cables you will need to hook it up to your PET.

If anyone is using one of these modules please send us some notes on how it works for you.

REVIEW
TNW 488/103 LOW SPEED MODEM
$320
The Net Works
5924 Quiet Slope Dr
San Diego, CA 92120

This modem module will allow you to use you computer via the phone lines. It is an auto originate, answer, and dial modem. Thus it truly is a full service mosem. It is well documented. The manual includes schematics and tips on how to use it. The best part is that included is a cassette ready to load into your PET that will allow your PET to function as a full duplex terminal.

Now your computer can not only answer the phone for you, but also can dial any phone for you, even long distance (watch out for a huge phone bill).

The unit has an extra IEEE slot which allows you to hook up other devices and use them simultaneously. A beautiful cabinet is $35 extra (and it matches the cabinet for their RS-232 module) and cables to connect it to your PET are $20. For $15 they will send you the necessary cables to hook into a CBS or CBT.

If anyone is using one of these modems please send us some notes about your experiences.

REVIEW
CURSOR
12 months/$24
Box 550
Goleta, CA 93017

CURSOR is a Cassette sent to subscribers once each month. It contains about 5 or 6 programs ready to use with your PET. Programs are a variety of categories including educational, household, and games. The games are well done and very unique.

At 5 or 6 programs a month for 12 months is about 60 to 70 programs for only $24. Cursor is very worth getting.

INTRODUCING

DUAL DRIVE MINIFLOPPY FOR PET!

DKH641 IS A PRODUCT OF CONVENIENCE LIVING.

*DUAL MINI FLOPPY DRIVE WITH 100K PER DISK SIDE FOR TOTAL 200K ON LINE.
*DESIGNED FOR COMMERCIAL SPEED REQUIREMENTS *FAST LOADING SPEED.
*DISKMON™ (DOS) AUTOMATICALLY REORGANIZES FREE DISK SPACE AFTER SAVE OR ERASE.
DISKMON IS RESIDENT IN ROM VIA DISK CONTROLLER BOARD PLUGGED INTO EXPANDAPET.
*DISKMON ADDS 14 COMMANDS TO BASIC INCLUDING DISK DATA FILES.
*DISKMON COMMANDS SUPPORT COMMERCIAL PRINTER OFF PARALLEL PORT SUCH AS CENTRONICS 779.
*FULL DISK SOFTWARE SUPPORT * FORTRAN & PLM COMPILERS THIS JANUARY.
*90 DAY MANUFACTURER'S WARRANTY ON HARDWARE*READY TO USE ON DELIVERY. WITH FULL INSTRUCTIONS AND UTILITY DISKETTE.
*CALL OR WRITE FOR ADDITIONAL INFORMATION * INITIAL QUANTITIES LIMITED.
*THIS SYSTEM IS FULLY SUPPORTED BY SOFTWARE FROM THE MANUFACTURER.
*ORDERS ARE NOW BEING ACCEPTED FOR DECEMBER & JANUARY DELIVERY.

DKH641	—DUAL DRIVE SYSTEM, COMPLETE WITH DISKMON	$1295.00
DKL067	—DISKMON ASSEMBLER LISTING/DOS	$19.95
ASM789T	—PET ASSEMBLER ON CASSETTE	$19.95
ASM789D	—PET ASSEMBLER ON DISKETTE (5.5 inch)	$49.95
LNK456	—AUTOLINK LINKING LOADER ON DISKETTE	$49.95
FOR300	—FORTRAN COMPILER ON DISKETTE (JAN'79)	$69.95
PLM400	—PLM COMPILER ON DISKETTE (JAN'79)	$49.95

★ ★ ★ BUSINESS PACKAGES STARTING IN 1st QUARTER 1979 ★ ★ ★

*THIS SYSTEM REQUIRES EXPANDAPET MEMORY (MINIMUM 16K—SEE BELOW)

PET COMPUTER

WHY NOT BUY FROM THE BEST?

8K PET ..... $ 795
24K PET (8+16K) $1210
32K PET (8+24K) $1310

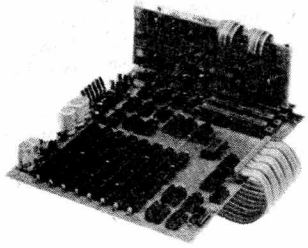
ALL PRICES INCLUDE 48 HR. PRE-SHIPMENT TESTING & 3 FREE CASSETTE PROGRAMS

PRICES SHOWN ABOVE INCLUDE EXPANDAPET. PME MEMORIES WILL HAVE HIGHER PRICING.

★ NEECO IS A CUSTOMER ORIENTED, FULL SERVICE COMPANY.
★ PETS RECEIVE 48 HR. 'BURNIN' BY NEECO BEFORE SHIPMENT.
★ FULL CUSTOMER SERVICE AND FULL PRODUCT SUPPORT.
★ 48 HR MAXIMUM 'TURNAROUND' ON PET WARRANTY SERVICE ON PETS PURCHASED FROM NEECO.
★ FULL PRE-PURCHASE INFO AVAILABLE FROM OUR PET INFO PACKAGE — WE ANSWER CUSTOMER QUESTIONS!
★ AUTOMATIC SOFTWARE/HARDWARE UPDATES VIA OUR PET OWNERS MAILING LIST — CALL/WRITE TO BE LISTED!
★ COMMERCIAL QUANTITIES AVAILABLE.
★ WE ALSO MARKET REPLACEMENT RAMS & ROMS, ETC.
★ OFF THE SHELF DELIVERIES (NO DEPOSIT REQUIRED). SCHOOL INQUIRIES INVITED!

INTERNAL MEMORY EXPANSION FOR PET!

EXPANDAPET™ *INTERNAL MEMORY EXPANSION UNIT*



*MOUNTS EASILY INSIDE YOUR PET
*EASY TO INSTALL (15 MINUTES)
*NO DEGRADATION OF PET SYSTEM
*USES LOW POWER DYNAMIC RAMS
*90 DAY PART&LABOR, 1 YR-RAMS.
*30 DAY MONEY BACK GUARANTEE.
*MOUNTING SLOTS FOR 4 BOARDS.
*CALL/WRITE FOR ADDITIONAL INFO
*DEALER INQUIRES INVITED.

EXPANDAPET PRICES

16K (+8K PET = 24K) $425
24K (+8K PET = 32K) $525
32K (+8K PET = 40K) $615

OPTIONAL PLUG-IN BOARDS
SERIAL I/O BOARD..... $75
S-100 I/O BOARD..... $75
4K EPROM BOARD..... $50

32K UNIT ALLOWS 8K OF ASSEMBLY LANGUAGE SUBROUTINES ACCESSED VIA THE USR COMMAND.

EXPANDAPET IS A PRODUCT OF CONVENIENCE LIVING.

FULLSIZED TYPEWRITER KEYBOARD FOR PET!

*COMMERCIAL QUALITY KEYBOARD WITH METAL ENCLOSURE.
*BASIC TYPEWRITER DESIGN FOR TOUCHTYPISTS.
*SINGLE KEY FUNCTIONS FOR ALL CURSOR CONTROLS. SHIFT/RUN, INSERT, CLEAR SCREEN/HOME CURSOR, MORE.
*FUNCTIONS SIMULTANEOUSLY WITH PET'S KEYBOARD.
*PLUGS DIRECTLY INTO PET'S LOGIC BOARD.
*DOES NOT USE USER OR IEEE-488 PORTS.
*NPK-101 IS FULLY TESTED & READY TO USE.
*ATTACHES DIRECTLY TO FRONT OF PET'S FRAME.
*CAN BE USED AS A REMOTE TERMINAL (SPECIAL ORDER).
*30 DAYS TRIAL PERIOD * 90 DAY WARRANTY.
*CALL OR WRITE FOR FULL SPECS-INITIAL QTY LIMITED.

ORDERS ARE NOW BEING ACCEPTED FOR DEC/JAN CUSTOMER DELIVERIES. **$139.95**

NPK-101 IS A PRODUCT OF NEW ENGLAND ELECTRONICS.

WE CANNOT LIST ALL OF OUR SOFTWARE AND HARDWARE PRODUCTS
CALL OR WRITE FOR OUR *FREE* SOFTWARE/HARDWARE DIRECTORY

DOMESTIC & OVERSEAS DEALER INQUIRIES INVITED ON * MEMORY * KEYBOARD * SOFTWARE

NEECO

NEW ENGLAND ELECTRONICS CO., INC.
248 BRIDGE ST., SPRINGFIELD, MASS. 01103
MON-FRI 9:30-5:30, SAT 10-2, E.S.T.

(413) 739-9626

ACCEPTED, ADD 3% SERVICE CHARGE.

RESOURCES

A

Abacus Software
PO Box 721
GrandRapids, MI 49510

A B COMPUTERS
PO Box 104
Perkasie, PA . 18944

ACADIANA SOFTWARE
Rt 3, Box 778
St. Martinville, LA 70582

ADVANCED COMPUTER PRODUCTS
PO Box 17329
Irvine, CA 92713

ALCORN DATA SERVICES
PO Box 1535
Corinth, Miss. 38834

ALPHA OMEGA SOFTWARE
1015 Saturn Springs Dr
Garland, TX 75041

APPARAT, INC
Box 10324
Denver, CO 80210

A TO Z INC, M H MAJOR
300 Guaranty Bank Plaza
Corpus Christi, TX 78475

AUTOMATIC HARDWARE CO
771 NE Harding St
Minneapolis, MN 55413

AXECO INDUSTRIES
13304 87 NE
Kirkland. WA 98033

AXIOM CORP
5932 San Fernando Rd
Glendale, CA 91202

B

BC COMPUTING
2124 Colorado Ave
Sun Prairie, WI 53590

BIOSYSTEMS RESEARCH
PO Box 160272
Miami, FL 33116

C. Blackstock
22312 80th Ave West
Edmonds, WA 98020

ROGER BRACHT
803 11th St
Rapid City, SD 57701

BREITENBACH SIMULATIONS
2905 Brandywine Dr
Ann Arbor, MI 48104

JERRY BRINSON
PO BOX 36014
Indianapolis, IND 46236

C

CALCULATOR/COMPUTER MAGAZI
Box 310
Menlo Park, CA 94025

CATALYST COMPUTER CENTER
Lakeland H.S. 1630 Bogie Lake
Milford, MI 48042

CHANNEL DATA SYSTEMS
5960 Mandarin Ave
Goleta, CA 93017

CGRS MICROTECH
PO Box 368
Southampton, PA 18966

-Continued-

R E V I E W - DR. DALEY, C-10 Cassette tapes (and any custom length)

1-20 at $1.25 each; 21-100 at 99¢ each; over 100 at 84¢ each C-10.

The tapes have a leader (good) and the screw type shell (good). Best of all is the fact that the tapes we have used thus far are EXCELLENT. We haven't had any problems with reliability yet. We are very happy to find a good alternative source of tapes. (So we won't have to buy Microsette tapes) The quality and price is comprable to that of Microsette. Recommended. Also note that tapes are available in lengths C-1 up to C-99. These are custom made for you. Tape duplication is also available.

R E V I E W - PRINTER ADAPTER (RS-232) - $98.50/$169 - Connecticut Microcomputer.

The PET Computer now can print!

If you have a printer already (RS-232) then this is just what you need. The adapter plugs into your PET. The adapter then has a cord and plugs into your printers RS-232 port.

If you don't have a printer, but want one right away, then this is for you. It is available NOW !! (We have one) You can then get any RS-232 printer and you're all set.

This printer adapter comes completely assembled in 2 set ups.
1) for $98.50 you get it completely assembled but without power supply, case or connecting cables.
2) for $169 you get it complete with a nice case, power, and cables.

Connecticut Microcomputer is also selling a Word Processor that works very well with this Printer Adapter. Their ad (see the middle two pages of this issue) was printed using their Printer Adapter and Word Processor.

The Printer Adapter plugs into your IEEE-488 bus. It is a very useful and convenient attachment for your PET. We hope that our next issue of the PET GAZETTE will be printed using our PET with this Printer Adapter. We have ours hooked up with a Teletype 43 and it works just beautifully. The PET is becoming very powerful.

***** BELOW IS THE GAME OF STARTREK3 (From Dr. Daley) PRINTED ***** ON A TELETYPE 43 USING A CONNECTICUT MICROCOMPUTER ADAPTER:

```
 WELCOME TO STARTRECK
WORKING
OBJECTIVE:DESTROY 25KLINGONS IN 50
YEARS THE NUMBER OF STARBASES IS 1
 81.068881UNIT HIT ON ENTERPRISE FROM SECTOR 2- 1 (-81.068881LEFT)
YOU HAVE NO SHIELDS.
LIBRARY COMPUTER DAMAGED.
. . . . E . . .  YEARS = 50
K . . . . . *.  CONDITION= RED
. . * * . * . .  QUADRANT= 4- 4
. . . . . .  SECTOR = 1- 5
. . * . . . . .  ENERGY = 3000
. . . . . .  PHOTON TORPEDOES= 10
. . . * . . . .  SHIELDS = 0
* . . . . . .  KLINGONS LEFT= 25
SHIELDS VERY LOW!
COMMAND?
DO SOMETHING!
 50.3994901UNIT HIT ON ENTERPRISE FROM SECTOR 2- 1 (-50.3994901LEFT)
YOU HAVE NO SHIELDS.
LONG RANGE SENSORS DAMAGED.
COMMAND?
DO SOMETHING!
 37.3751866UNIT HIT ON ENTERPRISE FROM SECTOR 2- 1 (-37.3751866LEFT)
YOU HAVE NO SHIELDS.
WARP ENGINES DAMAGED.
COMMAND?
BREAK IN  650
READY.
```

COMPUTER IS THE MACHINE

MAN IS THE COMPUTOR

OSBORNE & ASSOCIATES, INC.
630 Bancroft Way
Berkeley, CA 94710

Some Common BASIC Programs

now available on

PET® Cassettes

Now you can get 74 practical programs on cassette for the Commodore PET. These tested programs cover a wide variety of financial, mathematical, statistical, and general interest topics. All of the programs are from the Osborne & Associates publication *Some Common BASIC Programs*. The book explains how each program works, shows sample program runs, and has program listings with remarks.

The listings on the cassettes differ somewhat from the book's listings because we had to change the programs for the PET, but the explanations, sample runs, and listing remarks still apply. These tested programs cover a wide variety of financial, mathematical, statistical, and general interest topics.

The programs are recorded on a high quality cassette and packed in a hard plastic box. We guarantee tape readability — we'll gladly exchange a tape for a new one, provided the tape hasn't suffered physical indignities.

The cassettes retail for $10, including first class postage. The book *Some Common BASIC Programs* is available for $8.50 retail, plus shipping. Dealer discounts are available on the cassettes and books — contact us for details.

Here is a list of program titles:

Future Value of an Investment
Future Value of Regular Deposits (Annuity)
Regular Deposits
Regular Withdrawals from an Investment
Initial Investment
Minimum Investment for Withdrawals
Nominal Interest Rate on Investments
Effective Interest Rate on Investments
Earned Interest Table
Depreciation Rate
Depreciation Amount
Salvage Value
Discount Commercial Paper
Principal on a Loan
Regular Payment on a Loan
Last Payment on a Loan
Remaining Balance on a Loan
Term of a Loan
Annual Interest Rate on a Loan
Mortgage Amortization Table
Greatest Common Denominator
Prime Factors of Integers
Area of a Polygon
Parts of a Triangle
Analysis of Two Vectors
Operations on Two Vectors
Angle Conversion: Radians to Degrees
Angle Conversion: Degrees to Radians
Coordinate Conversion
Coordinate Plot
Plot of Polar Equation
Plot of Functions
Linear Interpolation
Curvilinear Interpolation
Integration: Gaussian Quadrature
Derivative
Roots of Quadratic Equations
Real Roots of Polynomials: Newton
Roots of Polynomials: Half-interval Search
Trig Polynomial
Simultaneous Equations
Linear Programming
Matrix Addition, Subtraction, Scalar Multiplication
Matrix Multiplication
Matrix Inversion
Permutations and Combinations
Mann-Whitney *U* Test
Mean, Variance, Standard Deviation
Geometric Mean and Deviation
Binomial Distribution
Poisson Distribution
Normal Distribution
Chi-square Distribution
Chi-square Test
Student's *t*-distribution
Student's *t*-distribution Test
F-distribution
Linear Correlation Coefficient
Linear Regression
Multiple Linear Regression
Nth Order Regression
Geometric Regression
Exponential Regression
System Reliability
Average Growth Rate, Future Projections
Federal Withholding Taxes
Tax Depreciation Schedule
Check Writer
Recipe Cost
Map Check
Day of the Week
Days Between Two Dates
Anglo to Metric
Alphabetize

OSBORNE & ASSOCIATES, INC.
P.O. Box 2036, Dept. AE1
Berkeley, California 94702

Name _____

Address _____

City _____

State _____ Zip _____ Phone _____

Please send:

	Price	Quantity	Amount
PET Cassette			
Some Common BASIC Programs (the book)			
California residents add 6% sales tax			
BART residents 6-1/2% sales tax			
Shipping charges (see below)			
TOTAL			

SHIPPING CHARGES

Books:
- ☐ All foreign orders $4.00 per book airmail
- ☐ $0.45 per book 4th class (allow 2-3 weeks in the U.S.A.)
- ☐ $0.75 per book UPS in the U.S.A. (allow 10 days)
- ☐ $1.50 per book special rush shipment by air in the U.S.A.
- ☐ Shipping for large orders to be arranged

Cassettes:
- ☐ No charge in the U.S.A., 1st class
- ☐ All foreign orders $1.50 per cassette airmail

- ☐ Payment enclosed
- ☐ Bill me ($70 minimum - approved O&A accounts only)

- ☐ Send me information on O&A book discounts
- ☐ Send me information on O&A cassette discounts

S1016

RESOURCES

-Continued-

CMS
5115 Menefee
Dallas, TX 75227

COMMODORE SYSTEMS
360 Euston Rd
London NW1 3BL ENGLAND

COMMODORE
3370 Pharmacy Ave
Agincourt, Ontario, CANADA

COMMODORE, PET COMPUTER DIV
901 California Ave
Palo Alto, CA 94304

COMPU-QUOTE
6914 Berquist Ave
Canoga Park, CA 91307

COMPUTER COMPLEMENTS CORP
147 Jericho Turnpike
Floral Park, NY 11001

COMPUTER FACTORY
790 Madison Ave
New York, NY 10021

COMPUTER MART SYSTEMS
13 East 30th St
New York, NY 10016

COMPUTER PROJECT
Peninsula School/Penins. Wy
Menlo Park, CA 94025

COMPUTER RESOURCES COMPANY
1437 Gordon St
Allentown, PA 18102

COMPUTERS ONE/#306 Kahala
4211 Waialae Ave
Honolulu, HI 96816

COMPUTER TUTOR
317 Elm St
Helena, Ark 72342

COMPU-THINK
648 Sheraton Dr
Sunnyvale, CA 94087

CONNECTICUT MICROCOMPUTER
150 Pocono Rd
Brookfield, CT 06804

CONTEMPORARY MARKETING
790 Maple Lane
Bensenville, IL 60106

CONTRACTORS' MANAGEMENT SYS
PO Box 212
Chantilly, VA 22021

CONTROL LOGIC
Natick, MA

CONVENIENCE LIVING SYSTEMS
648 Sheraton Dr NOW compu-
Sunnyvale, CA 94087 THINK

COYOTE ENTERPRISES
Box 101
Coyote, CA 95013

CREATIVE COMPUTING
PO Box 789-M
Morristown, NJ 07960

CREATIVE SOFTWARE
PO Box 4030
Mountain View, CA 94040

-Continued-

Dear Len:

Many thanks for the continuing high quality of the Gazette. Here are a few data for you; sorry that they'll probably miss your next issue. I'm sure that Tim has told you of our conversations, and of the fact that the Word Processor is appreciably improved over the previous version(s). I have a good deal of additional software which I will not be releasing through you (at least at this time), including a fascinating program which prepares and gives briefings; its interest stems in large part from the fact that I edit a page at a time - on the screen. (It works like a charm, and I'll be using it to brief a TRW corporate VP in a week or so on the uses of microcomputers in our business.)

Some specific data:

1) I have received the second cassette deck from Commodore, and it does not work with the older boards. In later boards, the connectors are two-sided; in the older ones, the cassette connectors (at least) contact only on the bottom. Alternatives: jumper the edge connectors to work on both sides, rewire the deck-2 connector. Possibly (also) use a Beeper (from HUH) which transposes the connections. I'll try the last of these soon and see whether it works; if not, I'll rewire the connector since I have two older machines. Note that if Commodore had wired the connector the other way it would work on all machines

2) I have bought both the Beeper and the Petunia from HUH. Both function correctly. The Beeper must be modified (cut an extra key) to work with the old machines. The Petunia uses both the User Port (as advertised) and the second cassette port- and does not provide a second connector to allow plugging in cassette 2 at the same time.

3) Mike Louder and I have been working around some limitations, and have some useful code for you. Here we go:

Get a character and return .

```
Old way: 10 GET C$: IF C$>"" GOTO10
         20 GET C$: IF C$=""GOTO20
         30 RETURN

New way: 10 POKE525,0:WAIT525,1:GET C$: RETURN
```

Picture is from: creative computing P.O. Box 789M Morristown, NJ 07960 MAY 78

Advance the tape between records

```
POKE59411,53: POKE514,0: WAIT514,16:POKE 59411,61: RETURN
```

Computed GOTO (GOTO A where A is a computed value)

```
PRINT "clr, cd,cd,cdGOTO"A"home":POKE525,1: POKE527,13:END
```

Computed instruction (instruciton is X$)

```
PRINT"clr,cd,cd,cd"X$"home":POKE525,1:POKE527,13:END
```

Comments: The first saves a lot of space (about 19 bytes vs. 39); the second avoids the (remote) possibility of the clock turning over during the conventional method and saves code; the latter pair are "impossible" functions in Commodore's BASIC which are of significant value in some esoteric code. The variations on the last are numerous, and neither of the ones which ends with "END" in fact terminates processing. A permutation on the last is a subroutine which executes the computed instruction, then returns to the program with everything (except the screeen) intact; note, however, that it cannot be used to write a BASIC line without destroying both the subroutine-return stack and all data:

```
PRINT"clr,cd,cd,cd"X$":RETURN:home":POKE525,1:POKE527,13:END
```

The variations are endless!

4) I spent a fruitful day at Commodore, and saw their new keyboard, the printer undergoing life test, etc. The new ROMS are not ready yet, and in fact still have some software work in progress. Many of the old POKE locations will be changed, so the code above will not work until the addresses are changed. The ROM monitor is a dilly, and will probably justify replacement of the chips in itself; of course, it was advertised as part of the original package, but was not provided.

Please keep up the good work.

Sincerely yours,

Mike

Michael Richter

PERK UP YOUR PET

$229.00

New Standard Size
Keyboard Adds Speed & Versatility

You asked for a versatile keyboard to attach to your Commodore PET. *And GRI did it right!* PERK is a convenient typewriter-style keyboard that attaches quickly. No modification required. In minutes you can have the speed and ease of standard typewriter input plus the added capacity of upper and lower case alpha characters, optional graphics, cursor editing, full screen control, full screen editing and more...including multiple hookups to a single PET. Find out all the ways PERK can make your PET much more valuable.

See your local computer store or contact GRI

GEORGE RISK INDUSTRIES, INC.

GRI Plaza • Kimball, Neb. 69145
Tel: (308) 235-4645

RESOURCES

-Continued-

C

CURSOR
Box 550
Goleta, CA 93017

D

DADS RELIABLE SOFTWARE
1614 Norman Way
Madison, WI 53705

DATA SYSTEMS
Box 1873
Rocky Mount, NC 27801

DILITHIUM PRESS
PO Box 92
Forest Grove, OR 97116

DR DALEY
425 Grove Ave
Berrien Springs, MI 49103

Carol Donovan
84 Christy Rd
Battle Creek, MI 49015

E

ECLECTIC SOFTWARE
2830 Walnut Hill Lane
Dallas, TX 75229

EDV - BENUTZER VERBAND
Gunther W Berlein
Postfach 29
D-8473 Pfreimd
Brunner-Bey-Strasse 35
W. Germany

EXCEL COMPANY
2241 Tamalpais Ave
El Cerrito, CA 94530

F

FANTASY GAMES SOFTWARE
PO Box 1683
Madison, WI 53701

FOREMAN
Box F
Mobile, AL 36601

FORETHOUGHT PRODUCTS
87070 Dukhobar Rd #K
Eugene, OR 97402

ANDY FRALEY
1753 York Rd
Reading, PA 19610

John Fung, Minnesota Daily
720 Washington Av SE, #357
Minneapolis, MN 55414

G

R A GATES
PO Box 756
Kentfield, CA 94904

GEORGE RISK INDUSTRIES
GRI Plaza
Kimball, NEB 69145

GRT CORP-CUSTOM PROD. DIV.
1286 North Lawrence Stn Rd
Sunnyvale, CA 94086

H

HOME COMPUTER CENTRE
6101 Yonge St
Willowdale, Ontario CANADA

DAVE HOWE
Box 28314
Sacramento, CA 95828

Kurt Huebner
1266 Valle Vista
Fullerton, CA 92631

REVIEW - FOOTBALL2 - $10 - DR. DALEY

This is an excellent simulation of a football game -- for 2 players. Played by pro rules, the offense can choose any one of 17 plays and the defense can choose one of 4 including goal line defense. Penalties come up just as in a real game. The computer analyzes how well your offensive play would have run against the defense chosen. (Of course it is random to a point). Anyone who likes football will like this computer version.

REVIEW - VIDEO CHECKERS - COMPU-QUOTE

While checkers is certainly not one of the world's most interesting or complex games (in my opinion) I do feel this program is excellent. It is truly a video checkers game; the board is POKEd, not PRINTed. In addition, pieces blink when they are moved, making the program easier to play. The program also catches illegal moves and will force you to jump a piece if you can (which conforms to the "official" checkers rules). It is truly the best checkers game I have ever seen. While it does not play a very good game of checkers, it plays better than most. In short, I believe there are more exciting games for the PET. But if checkers is in your taste, then by all means, get this program. (NOTE: I'm extremely impressed with the company - they recorded the program on both sides of the tape and provided fairly decent instructions. Other software vendors take note!)

review by Jon Staebell

REVIEW - GOMOKU - CMS - $9.95

The object is to get 5 men in a row - horizontally, vertically, or diagonally - on a 9x9 grid. The computer asks you your name and uses the first letter to designate your moves. It uses P for PET, unless your name happens to start with P, then it uses C for Computer.

There are 30 moves in the game. You go first. The computer plays a defensive game, but as soon as you make a non-threatening it takes the initiative. After you both have 20 men on the board the remaining 10 moves are moving men from one place to another.

The computer plays a tough game and makes its moves quickly.

One very nice feature of the program is once you choose your row & column for your move, it displays a "?" for a few seconds at that location. If you decide that is not the best place all you do is hit return and you may make your new move instead.

--Bill Bendoritis--

REVIEW - QUIBIC 4 - CMS - $9.95

This is a very good version of three dimensional tic tac toe.

Besides giving directions it will show you all 76 different combinations that win. If you don't wish to see them before each game they may be skipped.

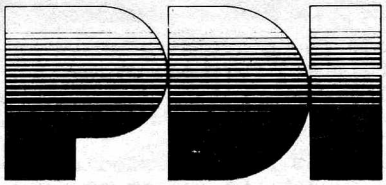
It plays a good game, but finally we did beat it once.

One nice feature is once you choose your move it displays a "?" in that location for a few seconds. If you change your mind, just hit return and make a new move. This is very nice because it is easy to make a mistake when you play on 4 boards of 16 squares.

--Bill Bendoritis--

REVIEW - TRAVERSE & CURVE/INTERSECT - $35 - A H McCann

These two programs are useful for Civil Engineers & Land Surveyors. Traverse does these calculations: 1)Bearing traverse 2)Field angle traverse using either deflection angles or interior angles 3)Compass adjustment for perfect closure 4)Inverse from coordinates. Curve/Intersect does these: 1)Solves all values of circular arcs given any of 6 possible pairs of unknowns 2)Solves all values of the intersection of two lines for the known coordinates of one point on each line and one of the following:a.Bearings of both lines b.Bearings of one line and length of the other c.Lengths of both lines. The programs do exist and we hope to find an engineer to help test them.



HAVING TROUBLE LEARNING BASIC?

STEP BY STEP is an interactive computer course in BASIC that's easy even for beginners. Program Design has developed a logical, structured approach that really works. At the end of STEP BY STEP, you'll be writing programs using all important BASIC commands.

AVAILABLE FOR TRS-80 LEVELS I & II, PET, AND APPLE II

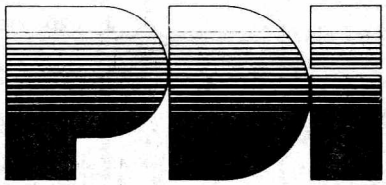
STEP BY STEP:

- presents material in small steps
- provides guided programming practice in each lesson
- tests your progress after each lesson
- teaches actual program writing, not just terms
- is suitable for anyone from junior high up, regardless of math background

10 lessons with quizzes, plus final test 3 cassettes
64 page Workbook $39.95 plus $2.00 shipping

VISA & Master Charge accepted (include number, exp. date, MC include digits above name)

Department 400
Program Design, Inc., 11 Idar Court, Greenwich, Conn. 06830



PROGRAMS FOR KIDS

Educational and fun. Developed by educational designers. Teach essential skills in an exciting new way.

PRESCHOOL IQ BUILDER—Helps 3-to-6-year-olds develop vital intellectual skills needed to do well in school.
7 programs + Guide TRS-80 Levels I & II, PET, Apple II

MEMORY BUILDER: CONCENTRATION—Educational games to help children 6 and up improve memory.
3 games + Guide Apple II & PET

STORY BUILDER/WORD MASTER—games that teach grammar and vocabulary to children 9 and up.
4 games + Guide TRS-80 Level II, PET, Apple II

GRAPH BUILDER—teaches children 10 and up to read graphs. Includes games.
11 programs + Guide TRS-80 Levels I & II

Each title $13.50 plus 5% shipping
VISA & Master Charge accepted (include number, exp. date, MC include digits above name)

Department 80
Program Design, Inc., 11 Idar Court, Greenwich, Conn. 06830

RESOURCES
-Continued-

H
HUH ELECTRONIC MUSIC PRODUC
PO Box 259
Fairfax, CA 94930

I
INSTANT SOFTWARE/KILOBAUD
Peterborough, NH 03458

INTERACTIVE COMPUTER SYSTEMS
PO Box 517 **CANADA**
Fredericton, New Brunswick

INTERNATIONAL TECHNICAL SYST
PO Box 264
Woodbridge, VA 22194

J
JAMESTOWN SMALL COMPUTER SYS
2508 Valley Forge Dr
Madison, WI 53719

JAMES JOHNSON
9304 Emory Grv Rd
Gaithersburg, MD 20760

RANDY JULIN
15 Poncetta Dr #322
Daly City, CA 94015

K
DON KETCHUM
313 Van Ness Ave
Upland, CA 94720

BRENT KLINCHUCH
2744 Ashwood St
Orange, CA 92665

L
LAWRENCE HALL OF SCIENCE
COMPUTER PROJECT
PETE ROWE
ROOM 254
University of California
Berkeley, CA 94720

ED LICHTEN
35090 Quaker Way
Farmington Hills, MI 48000

RICHARD LIEBERT
PO Box 268
Scarborough Station, NY10510

M
MADISON COMPUTER STORE
1863 Monroe St
Madison, WI 53711

MAGNEMEDIA
17845 SkyPark Circle, SuiteH
Irvine, CA 92714

MARKETRON
1240 Bay St Mall
Toronto, Ontario, CANADA

MATRIX MAGAZINE
1041 North Main St
Ann Arbor, MI 48104
-Continued-

Dear Mr. Lindsay:

Your problem in issue #4 on avoiding unwanted keyboard strikes being interpreted as INPUTS was very elegantly put, since the clue for working it out is in the same issue at the bottom (?side) of page 7.

The apparent solution, as you suggested (line 90 of the enclosed program), is to set the buffer counter equal to zero before each INPUT statement. Another way would be to set the buffer contents equal to blanks (line 100); these would be printed after the prodding question-mark as leading blanks before the INPUT.

An interesting finding: there is a counter (loc 525) and a ten-character buffer (loc 527-536). However, since the counter numbers a maximum of nine characters, the tenth character (loc 536) is never displayed!

The enclosed display program (lines 110-170) will allow users to see how hitting keys changes the contents of this buffer.

Sincerely,

Doc

STEFAN IRVING, M.D.

CTRL-G = clear screen
CTRL-V = reverse
CTRL-H = cursor left
CTRL-L = cursor right
CTRL-D = cursor down

LISTING OF PROGRAM TO DISPLAY CONTENTS OF KEYBOARD MEMORY BUFFER

```
 90  POKE 525,0   :   REM   zeroes buffer counter
100  FOR I=527 TO 536 : POKE I, 32 : NEXT I  :  REM  blanks buffer contents
110  ?"{CLR}KEYBOARD BUFFER CONTAINS" PEEK(525) "CHARACTERS"
120  ?"{4 RIGHT}{RVS}LOC","{4 RIGHT}CONTENTS
129  REM  prints keyboard buffer contents continuously
130  FOR I=526 TO 536
140  PRINT I, CHR$(PEEK(I))
150  NEXT I
160  FOR J=1 TO 600 : NEXT J  :  REM  timed loop to relieve eyestrain
170  GO TO 110
```

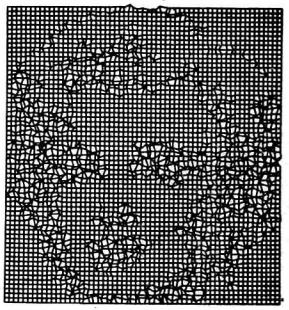
* * * * * MORE GARBAGE BELOW * * * * * * * *

Last issue I wanted to add some pictures and drawings. Someone snuck in a terrifying picture. We actually would like to print pictures a bit more beautiful. PLEASE SEND US some pictures, especially if your PET prints them out. The picture on the right is from CREATIVE COMPUTING, PO Box 789-M, Morristown, NJ 07960. Are we on the right track yet???
How about below - also from Creative Computing ???
PS: the picture that originally could have been printed here got censored. Too bad!!!

ARTISTS OUT THERE: Please send us some pictures --could be robots, PET computers among any kind of background setting, etc. --THANKS--

Here's what the group did to a photograph of Marilyn Monroe:

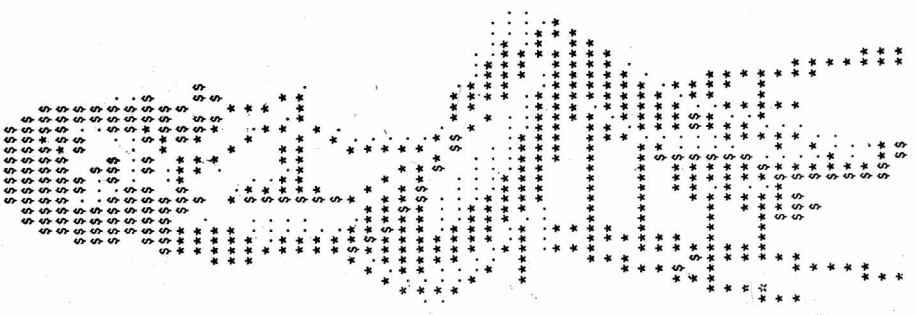
MONROE IN THE NET



- 4 different gray levels - 4 different symbols (1 for each gray level): a blank, a period, an asterisk, and $. 1537 symbols altogether (53 rows x 29 columns)

In the specifications, the numbers are small, yet the picture is clear. The clarity was obtained by non-computerized fanagling.

from:
MAY/JUNE 1978 issue of
CREATIVE COMPUTING
PO BOX 789-M
MORRISTOWN, NJ 07960



Is the GPIB acting like a viper?

CALL M & E, the GPIB charmers.

M & E Associates is a Microcomputer Engineering consulting firm that specializes in GPIB IEEE-488-1975 bus designs, microcomputer systems, and data acquisition and control.

Since our start in 1976, we have consulted with Airco Temescal, American Sign and Indicator, Computer Products, Wintek Corporation, Commodore, and Siemens, to name just a few. Are you having a particular design problem? Are you having trouble getting on the bus? Let M & E assist you!

Our fees range from $30.00 to $80.00 per hour depending upon the size and complexity of the job. For an immediate response to your special needs, please call on the experts, M & E Associates.

M & E ASSOCIATES

MICROCOMPUTER ENGINEERING
10439 N. STELLING ROAD · CUPERTINO, CA 95014
(408) 739-5168

RESOURCES

-Continued-

M

AH MCCANN L-430
PO Box 5506
Livermore, CA 94550

HOWARD MCLAY
25623 Pennie
Dearborn Heights, MI 48125

M & E ASSOCIATES
10439 N Stelling Road
Cupertino, CA 95014

BENNETT MEYER
Box 575
White Plains, NY 10602

MICRO
8 Fourth Lane
So Chelmsford, MA 01824

MICROCOMPUTER ASSOCIATES
2589 Scott Blvd
Santa Clara, CA 95050

MICROCOMPUTER INDUSTRIES
1532 E Mulberry,Suite H
Fort Collins, COLO 80524

MICROCOMPUTER RESOURCE CENT
1929 Northport Dr, Room 6
Madison, WI 53704

MICROSIGNAL
PO Box 161988
Sacramento, CA 95816

MICROSOFTWARE SYSTEMS
PO Box 1442
Woodbridge, VA 22193

MICROTRONICS
5943 Pioneer Road
Hughson, CA 95326

MICROTRONIX
PO Box Q
Philadelphia, PA 19105

MINDS EYE PERSONAL SOFTWARE
PO Box 354
Palo Alto, CA 94301

C W MOSER
3239 Linda Dr
Winson-Salem, NC 27106

N

NAIL
Box F
Mobile, AL 36601

NATIONAL CORPORATE SCIENCES
790 Madison Ave
New York, NY 10021

NCE/ COMPUMART
1250 N Main St
Ann Arbor, MI 48104

NESTAR SYSTEMS
810 Garland Dr
Palo Alto, CA 94303

THE NETWORKS
5014 Narragansett #6
SanDiego, CA 92107

-Continued-

REVIEW,- PET Information Package & Products Directory - FREE -
New England Electronics Co.

NEECO sends this pack to anyone who is interested in the PET. It is very helpful, especially if you are trying to find out about the PET BEFORE you buy one. The products directory is very professionaly done. They include a reprint of an excellent article, PET's First Repart Card from Kilobaud magazine. PET owners will appreciate the directory of products for the PET available through NEECO. They are dealers for a good number of companies.

REVIEW - READ, WRITE PET MEMORY - $7.95 - Don Ketchum

This program allows you to enter machine language programs into the PET and execute them. This is not a machine language monitor but a Basic program. It has an excellent format with a shopping list menu of commands.

The documentation is excellent. It has a couple of examples of programs and also compares the speed of a machine language program with that of a Basic program.

The one fault I see with the program, is that it should display what is currently in the location you are going to change when in the write memory section. This would be helpful when editing or checking a program. This should be easy to change in the program if you want to do this.

Overall, this is an excellent starting point for people who want to learn how to write short machine language programs. For the more advanced, I would suggest a machine language monitor.

-- Dave Mehaffy --

PASSWORD by R Sosnowski

- The specs on the keyboard buffer were fascinating! I've been looking for a way to insert a "password" into the program and this is neat! See the coding that follows for some fun:

```
 10 ?"THIS PROGRAM REQUIRES A PASSWORD TO 'DO
 20 ?"ITS THING'.  THE PASSWORD IS THE NAME
 30 ?"OF A FAMILY MEMBER."
 50 C=PEEK(525) :IF C=8 THEN 70
 55 IF PEEK(526+C)=13 THEN 70
 60 GOTO 50
 70 Q$="" :FOR I=527 TO (526+C) :Q$=Q$+CHR$(PEEK(I)) :NEXT
 75 IF Q$="DADDY"+CHR$(13) THEN300
 80 ? Q$;" IS NOT THE WORD."
200 POKE 525,0 :GOTO 50
300 ?"THAT'S THE WORD!" :GOTO 200
```

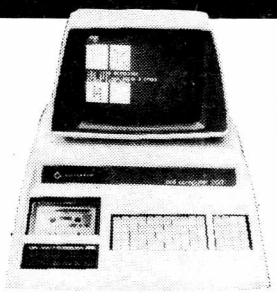
T A P S
MUSIC by Bruce Adams

```
  40     A = 30
  50     POKE 59467,16: POKE 59466,104
 100     READ T,C
 110     IF T = 1000 GOTO 2000
 120     B = T*A
 130     GOSUB 1000
 140     GOTO 100
1000     FOR I = 1 TO B
1010     POKE 59464,C
1020     NEXT I
1030     RETURN
2000     POKE 59464,0: POKE 59466,0: POKE 59467,0:END
3000     DATA 2,237,.2,0,1,237,.2,0,4,177,1,0,2,237,.2,0,1,177,.2,0,
         4,140,1,0
3010     DATA 2,237,.2,0,1,177,.2,0,3,140,.4,0,2,237,.2,0,1,177,.2,
         0,3,140,.4,0
3020     DATA 2,237,.2,0,1,177,.2,0,5,140,1,0,2,177,.2,0,1,140,.2,0,
         5,117,.2,0
3030     DATA 4,140,.2,0,3,177,.2,0,5,237,.2,0,4,237,.2,0,2,237,.4,
         0,5,177,1000,0
```

BUY FROM THE BIGGEST

NCE/CompuMart

1250 North Main Street, Department PAC8
P.O. Box 8610 Ann Arbor, Michigan 48107



PET
$795

THE PET CONNECTION

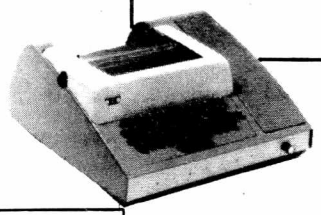
Networks Bidirectional RS-232 Interface
- Single Port $240.00
- Dual Port $280.00
- Cabinet $ 35.00

Networks Modem for PET
- Attaches to DAA $320.00
- Cabinet $ 35.00

PET with 8K user memory / $795.00
Second Cassette drive $99.95
RS-232 Printer Adapter — assembled board $98.50
With power supply, case & connector $169.00
Beeper — PET controlled 'beep' $24.95

Video Buffer — add a conventional monitor $29.95

EXPANDAPET - Economical 16K memory expansion for the PET (includes 1 daughter board) $435.00
without daughter board $395.00



Hams! Add a PET to your rig.

Computerize your station with Microtronics M-65 Ham Interface and included software. You simply plug the unit into your PET and you're ready to display, transmit and receive either CW or RTTY at rates up to 100 WPM.

ASSEMBLED KITS
$99.95

SECOND CASSETTE FOR PET-$99.95

This peripheral from Commodore gives you the ability to use one tape deck for input and one for output, copy files, etc.

SELECTRIC-BASED TERMINAL FOR PET

$895

We have interfaced our TC-71 to the PET. Use with the IEEE-488 bus as a printer or with the VIA User Port for bidirectional I/O. Ideal for Word Processing applications.

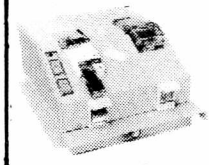
Sale price if bought with PET $795

LOW-COST PRINTER FOR PET

This is a completely refurbished Teletype KSR-33 terminal ready to attach to your PET's interface to use as a printer.

INTRODUCTORY PRICE $395

READER/PUNCH



8 LEVEL PAPER TAPE/READER PUNCH

USED (90 day warranty) $175.00
Documentation Package $15.00

NEW ASCII INTERFACES for Reader/Punch

30 Day delivery on Interfaces

Boards & Cables
- Parallel $220
- RS232 Serial $350

Board, Cables, Power Supply
- Parallel $490
- Serial $615

Board, Cables, Power Supply, Enclosure
- Parallel $575
- Serial $780

KIM-1

The original fully expandable single board computer

Assembled
$179
with power supply
$209

EXPAND YOUR KIM SYSTEM:

KIMSI
KIM to S-100 Board
- Assembled $169
- Connector set $15

KIM4
Expansion board $119

MICRO TECH. POWER SUPPLY
Assembled $34.95

KIM ENCLOSURE

Give your KIM a professional appearance. No alterations required, sturdy Kydex 100, Black
$23.50

WE WANT TO BUY USED MICROCOMPUTERS

Any Quantity

Urgently needed:
- Peripherals
- Manufacturers surplus
- Closed stores stock

CASH AVAILABLE

Call Today: (313) 994-3200

EXIDY SORCERER — $895

- Z-80 Processor
- Full-size ASCII keyboard
- User definable characters
- Up to 32K on-board RAM
- Interchangeable ROM PACs
- 30 x 64 display
- Resident 4K Monitor ROM
- Dual Cassette I/O
- Serial and Parallel I/O
- Complete Operators Manual
- Only $895

Top value in our catalog, simply add a monitor and tape decks to complete the system. Can be used as a terminal. Later ROM PACs will offer Z-80 Assembly Language, APL, PILOT, Word Processing and a DOS PAC for disk-based FORTRAN and COBOL. What a system for $895!

- Sorcerer 8K $895
- Sorcerer 16K $1150
- Sorcerer 32K $1395
- 16K Expansion $299

Single board
SALE!
VIDEO TERMINAL by XITEX

16 Ln x 64 chr. display, 128 printable characters, software UART (ASCII or Baudot), 3 serial interfaces & cassette I/O, true composite video, TTL compatible, easy power connection.

Assembled & tested **NOW $187**

Hazeltine 1400

IN STOCK NOW Only $749.00

Now a 5th Generation in Terminals:

Introductory Sale Price — Immediate Delivery

- 24 x 80 display
- RS-232C interface
- 110 to 9600 Baud
- 12" CRT Monitor
- Remote screen control
- Uses 8048 microprocessor
- State-of-the-art design

A full capability terminal completely assembled with a 90 day warranty for less than you'd pay for a kit.

Compucolor II

NEW!

- Beautiful 128 x 128 color graphics
- 4K Graphics RAM
- 16K ROM with Disk BASIC
- Built-in 51K mini floppy
- RS-232 interface
- Full size keyboard
- Preprogrammed diskettes avail.

Model 3 8K RAM $1495
Model 4 16K RAM $1795
Model 5 32K RAM $2395

TC-71 SELECTRIC TERMINALS

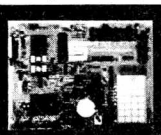
Top-quality printing terminal with RS-232, PTTC code. Includes desk, 130 char/line, ASCII version employs 6802 for code conversion. See our catalog for details.

- ASCII $864
- Refurbished $695
- Working $495
- As-Is $339

SALE!

SALE ASCII INTERFACE FOR TC-71
30 day delivery Normally $199 NOW **$169**
Acoustic Coupler for use with ASCII TC-71 **$159**

- 28 Double function keypad including up to 24 "Special" functions
- Easy-to-view, 8-digit hex led display
- KIM-1 hardware compatibility
- 6502 based system
- 4K byte ROM resident monitor and operating system
- Single 5 volt power
- 1K bytes of 2114 static RAM on sockets provided for immediate expansion to 4K bytes
- Enhanced software
- Standard interfaces include
  - Audio Cassette Recorder Interface with Remote Control
  - Full Duplex, 20mA Teletype Interface
  - System Expansion Bus Interface
  - TV Controller Board Interface
  - CRT Compatible Interface
- 50 I/O Lines in the basic system



SYM-1
From Synertek $269.00

SALE
$225
SANYO MONITOR
VM4209 9" quality monitor **$149**

New Acoustic Coupler

$159

NCE/Compumart Inc. breaks the price barrier with a new 300 baud RS-232C acoustic coupler. For only $159 you get an assembled, tested stand alone unit which accepts the standard telephone handset for full or half duplex operation. Complete with power supply and carrier detect light, the unit is housed in an attractive case for desk top use.

SALE!
TI PROGRAMMER

Hexadecimal, octal, decimal calculator/converter.

Reg. $59.95 **NOW $49.95**

A Home Computer & A Video Game in a Single Unit!

INTERACT Model One
14 FREE CASSETTES Worth $294.

- Color graphics on your TV
- Music and sound synthesizer
- Built-in cassette tape drive
- Large 53-key keyboard
- Two joysticks included
- Edu-BASIC cassette included
- 8080 Microprocessor
- 8K RAM, 2K ROM

If you can't decide between a sophisticated video game and a home computer then the Interact Model One is for you. Hook it to your color TV and you've got both! You can play one of the games which are included free or you can load Edu-BASIC and write your own games. You can save programs or data using the built-in cassette tape drive. Best of all you get over $294 worth of free cassettes including:

IN STOCK NOW! $499

Edu-BASIC — Write programs
Concentration — The memory game
Dogfight — Aerial battles
Add-Em Up — A math game
Biorhythm — Plot your own
Blackjack — Wager video bucks
Compute-A-Color — Easy graphics
Hangman — The word game
Knockdown — A dice game
Maze — Computer maze
Regatta — Race your ship
Showdown — Gunfight
Trailblazer — Cut off your opponent
Blank — Save programs here

Rockwell
AIM65

- Fully assembled, tested, and warranteed
- Addressing to 65K bytes (1K RAM on board)
- Includes onboard
  - Powerful 4K ROM Debug/Monitor
  - Sockets for additional 4K RAM 16K ROM
  - 20 Col. ASCII Thermal printer (90 lines/min.)
  - Full size (54 key) Alphanumeric keyboard
  - 20 char ASCII Alphanumeric display
  - Application Conn. for TTY, 2 cassettes, 2 8 big I/O ports
  - Expansion Conn. (try our KIMSI S-100 board)
  - Both connectors totally KIM-1 compatible
- Easy Power connections $375

Options — 4K ROM Assembler/Text Editor
8K Basic ROM

10 DAY RETURN PRIVILEGE

- 90 day limited warranty
- Newest, most exciting products in personal computing
- Outstanding values
- All items fully assembled and tested unless otherwise stated.
- Send for our catalog for more detailed product information.

(313) 994-3200

Member Computer Dealers Association

Just say charge it! Which card?

- Michigan residents add 4% sales tax • Foreign order (except Canada) add 10% additional handling (U.S. currency only) • P.O.'s accepted from D&B rated companies — shipment contingent upon receipt of signed purchase order • Phones open from 9:00 a.m.-7:00 p.m. EST Monday-Friday, 10:00 a.m.-5:00 p.m. Saturdays • Open accounts invited—call for credit application • Most items in stock for immediate shipment—call for delivery quotation • Sorry—no C.O.D.'s • All prices subject to change without notice. • In the Ann Arbor area? Retail store open 11:00 a.m.-7:00 p.m. Tuesday-Friday, 10:00 a.m.-5:00 p.m. Saturdays (closed Sunday & Monday)

RESOURCES

-Continued-

NEW ENGLAND ELECTRONICS CO
248 Bridge St
Springfield, MA 01103

OSBORNE & ASSOCIATES
PO Box 2036'
Berkeley, CA 94702

PACIFIC DATA PRODUCTS
3835 E Olivo Ct
Camarillo, CA 93010

THE [redacted] PAPER
PO Box 43
Audubon, PA 19407

PEOPLES COMPUTERS
1263 El Camino Real, Bx E
Menlo Park, CA 94025

PERSONAL COMPUTER CORP
Frazer Mall, Lancaster, Rt352
Frazer, PA 19355

PERSONAL SOFTWARE
PO Box 136-05
Cambridge, MA 02138

PET CASSETTE EXCHANGE
1929 Northport Dr, Room 6
Madison, WI 53704

PET CONNECTION
4108 Buckeye
Madison, WI 53716

PET GAZETTE
1929 Northport Dr, Room 6
Madison, WI 53704

PET LIBRARY
401 Monument Rd #177
Jacksonville, FL 32211

PET OWNER GROUP/CARL MARTIN
2001 Bryan Tower #3800
Dallas, TX 75201

J Petrey
3208 Navajo Way
Las Vegas, NV 89108

PET SHACK
PO Box 966
Mishawaka, IN 46544

PET SOFT
318 Fulham Rd
Chelsea
London
ENGLAND SW10 9UG

PET USERS GROUP
Box 371
Montgomeryville, PA 18936

PET USERS GROUP/ROY OBRIEN
Box 379
S. Bound Brook, NJ 08880

PET USERS GROUP/LEN LINDSAY
1929 Northport Dr, Room 6
Madison, WI 53704

PICKLES & TROUT
PO Box 1206
Goleta, CA 93017

PROGRAM DESIGN INC
11 Idar Court, DEPT 110
Greenwich, CT 06830

-Continued-

J K Johnson sent us this program to SET BASIC UPPER LMITS.
It is to be used as a lead program before a BASIC program. This program is very useful to automatically set upper limits.
It loads first, Sets limits, then stops and automatically loads the following program. The number poked in statement #110 controls the upper limit. The #31 in this example permits a 256 byte Machine Language program or variable starage between loads of two BASIC programs.

```
110 POKE 135,'31
120 PRINT"(CLR),4DOWN)LOAD":POKE525,2:POKE526,13:POKE527,13:PRINT
    "(HOME)":END
```

NOTE: if you are adding a second cassette deck using the article from PET User Notes, put a capacitor across the remote switch & an inductive spike clipper across the relay coil.

SAVING A PROGRAM ON TAPE

With the PET computer saving a program on tape is very easy and reliable. You don't have to worry about manually winding past the leader. (As with [redacted] others) About 17 seconds is allowed after you start the recording before it actually records the file name and begins.

We recommend using a good quality tape. Do not overlap programs by recording on both sides on the same part of the tape. Use short C-10 tapes, you can fit an 8K program at the beginning of each side and not overlap in the middle.

A NOTE ON BASIC BUGS IN THE PET

Two bugs in Commmodore BASIC need comment: one has been neglected in documentation to date, the other has been exaggerated.

The neglected bug occurs when some instructions (notably a GOSUB) span a page boundary. The effect is to give a RETURN WITHOUT GOSUB ERROR. Isolation and cure are equally simple: add a single character in any lower line number (or start the offending line with a colon). If the page boundary was the problem, the code will now be fixed. Cost: one byte of memory.

There have been complaints about the 256-element array limit, a bug which definitely needs fixing. But it causes negligible problems in practice in an 8K machine. After all, how many bytes do you want in each element in a 1000-element array? If you need more than one, you will be spending a lot of memory on a single array. One solution that I use a lot is to form a string, each element of which is a value; position in the string is one of the indices. I am then able to get a single array with more bytes than the machine can address! (Be careful not to print that string - it may be full of 147°s or other problematic characters.) Just remember that the value of a character is what YOU choose to make it with your software.

Happy programming!
Mike Richter

Dear Len,

In answer to Bill Tendoritis' question, on p. 53 of your Aug.- Sept. issue of "The PET GAZETTE", the following two letter combinations are part of PET's vocabulary: ON, IF, OR, TO, and FN. As a consequence, these cannot be used as part of, e.g., a DIM statement; e.g. DIM MON$, DIM MIF$, DIM MOR$, DIM MTO$, DIM MFN$ all give syntax error. Curiously, although TI is another reserved combination, DIM MTI$ is OK!

It would appear that Commodore is aware that BASIC in ROM does not handle singly subscripted variables when the subscript exceeds 255 (it "wraps around" and starts in again at zero). I'm not certain that they realize that multiply subscripted variables give the same trouble when the product of the subscripts exceeds 255. Thus, for, e.g. A$(N,2), N cannot exceed 127; for A$(P,3), P cannot exceed 85; for A$(R,4), R cannot exceed 63; etc. etc. This is also true for A(L,M,N), and for A%(L,M,N). These restrictions are so serious that for file applications I have had to avoid muptiply subscripted arrays altogether.

Keep up the good work!

Yours sincerely,

Arnold H Fainberg

Dr. Arnold H. Fainberg

Sawyer Software

Business Software for your 8K PET™

★★★ NEW ★★★

ACCOUNTING PACK 1 —
Accounting Pack 1 is a general ledger package designed for small businesses and homeowners. It contains check journal, general ledger, income statement (current ytd, previous month ytd and current month), balance sheet (current month and previous month). There are 15 commands and 6 reports that can be generated. The system uses an unique single-entry bookkeeping system and can hold up to 50 entries per period (month, week, day) and up to 40 different accounts. Each period's data is kept on convenient cassette tapes. Utilizing the general ledger command the user can view the general ledger entries for the month from Assets to Expenses or stop in midstream and view one particular account. Or the user can type in an account name such as "Advertising" and view the entries for that month. The Accounting Pack 1 program includes a checkbook reconcilation routine which aids in finding checkbook errors. **Sawyer Software** plans updates to Accounting Pack 1 to enable the user to use a printer, floppy disk or more memory. Accounting Pack 1 is well documented, with a newly updated User's Manual. Several businessmen are using Accounting Pack 1 and have written to us their satisfaction with the program along with their purchase of other software.
..... **$25.00**

SCHEDULE PLANNER —
Schedule Planner can be used by secretaries, receptionists, housewives or anyone wanting to plan and have at their fingertips their own schedule. Data entered is data: time, priority and description. The commands allow the schedule to be shown for a particular day, request of time or the "viewing" of appointments according to importance.
..... **$15.00**

SCHEDULE PLANNER #2 —
Schedule Planner #2 includes all the features of Schedule Planner, but is used for one or more individuals. Utilizing Schedule Planner #2 a customer can call in asking when his appointment with Dr. Jones is and in seconds the receptionist can give the date and time. Or Dr. Jones can find out his schedule for the day. With the viewing command, an appointment at 12:00 on a particular day will display on the screen at that time allowing receptionists and secretaries to validate appointments.
..... **$20.00**

COMING SOON —
Business Software for your 16K TRS-80. Write or call for details and availability.

Dealer inquires invited.

ACCOUNTING PACK II —
Accounting Pack II is a much more powerful version of Accounting Pack I. It has all the features of Accounting Pack I, plus up to 250 entries per period, MENU, Optional debit-credit of entries, easy addition or deletion of accounts, formatter for reports, intelligent report generator and single entry for sales transactions. Accounting Pack II requires at least 8K additional memory for your PET. OPTIONS: 1. Accounting Pack I to Accounting Pack II data file converter (free to previous owners of Accounting Pack I).
..... **$45.00**

BUSINESS ANALYSIS —
Business Analysis allows management to have available to them information for financial planning decisions. Up to 4 years of balance sheet and income statement information can be entered with resultant analysis in the areas of liquidity, leverage, profitability and activity. The ratios generated for each year are the: current ratio, acid test, debt-nw, profit-nw, profit margin, sales-rec, sales-inv, sales-wc, with a brief explaination of each. The growth analysis gives the yearly growth in 5 areas and the average growth in 5 areas. Future growth analysis projects figures for the next year.
..... **$30.00**

FINANCIAL PACK I —
Financial Pack I includes Amortization Schedule, Calendar (which figures days between two dates), Rebate (which is calculated on the Rule of 78's), Compound, Annuities and Monthly payment.
..... **$15.00**

CHESSBOARD —
Chessboard allows two players to play chess on your own PET graphic chessboard. This program displays each player's time and records each move to allow you to playback the game at another time.
..... **$15.00**

PAYROLL—
Especially designed with the small businessman in mind. Utilizing cassettes can record data for any number of employees (8 employees per cassette). Computes tax information and updates totals for quarterly and yearly reports. Employees can be salaried or hourly and pay periods can be either weekly, bi-weekly, semi-monthly or monthly.
..... **$30.00**

BUSINESS GRAPHIC PACK 1 —
Business Graphic Pack 1 is a simple program to use, but professional in output. The graph includes title, labeling of axis, dual graphic ability, whether the data is in Mill's, 100's or 1000's, and an optional x-axis = date and labeling of the x-axis with month and year. Entry is as easy as typing the title, # of entries, the X,Y value (Jan. 15, 1978 would be entered as 115.78), entering if the x-axis = date, if the user wants crosshatching and then graphing. The program also includes Nth order and Geometric regression to give the user a formula for his set of data (if possible).
..... **$25.00**

CHECKBOOK RECONCILIATION —
Designed for ease of use and to find those troublesome checkbook errors, this program balances your checkbook and bank statement from month to month. It locates over ten different types of errors and instructs the user on correcting them, including bank statement errors made by your bank. Records data on cassette for next month's balancing - saving re-entry of figures.
..... **$25.00**

CALCULATOR —
Especially for the accountant-bookkeeper. This program not only allows your PET to function as a calculator, but also has such features as Lister (which verifies and displays errors between two tape listings) and Matrix (which adds columns vertically and horizontally).
..... **$10.00**

All Programs include documentation, are in BASIC and on cassette.

*PET is a trademark of Commodore Business Machines, Inc.

Sawyer Software

201 Worley Road
Dexter, Mo. 63841
314-624-7611

RESOURCES

-Continued-

P

PRACTICAL COMPUTING
2 Duncan Terrace
London N1 ENGLAND

PROGRAM/PETABLE
PO Box 461
Philipsburg, PA 16866

PROGRAMMA CONSULTANTS
3400 Wilshire Blvd
Los Angeles, CA 90010

PROGRAMMERS SOFTWARE EXCHANGE
2110 North Second
Cabot, Ark 72023

PRS - PROGRAM OF THE MONTH
257 Central Park West
New York, NY 10024

ELLIOTT PURSER
PO Box 466
Eldorado, CA 95623

PYRAMID DATA
6 Terrace Ave
New Egypt, NJ 08533

Q

QUALITY SOFTWARE
10051 Odessa Ave.
Sepulveda, CA 91343

R

RECREATIONAL COMPUTING
1263 El Camino Real, Bx E
Menlo Park, CA 94025

REICH ENGINEERING
635 Giannini Dr
Santa Clara, CA 95051

MIKE RICHTER
2600 Colby Ave
Los Angeles, CA 90064

RICO ENTERPRISES
8 J Lakeside Dr
Ledyard, CT 06339

PETER RUETZ
368 Albion Ave
Woodside, CA 94026

WALTER RYCHLEWSKI
603 Spruce
Liberty, MO 64068

S

HARRY J SAAL
810 Garland Dr
Palo Alto, CA 94303

MJ SALISBURY CASE
Box 6633
Oxnard, CA 93030

SAWYER SOFTWARE
201 Worley Road
Dexter, MO 63841

SCELBI COMPUTER CONSULTING
PO Box 133 PP STN
Milford, CT 06460

-Continued-

```
 0 REM*****PRINT ON PRINTER EACH KEY HIT*****
 1 OPEN1,5,2:CMD1
 2 POKE525,0:WAIT525,1:GETA$:PRINT#1,A$;:GOTO2
READY.
```

PET HINTS by Jon Staebell

Last issue I presented some ideas for making programs more understandable to people. I showed how the blinking cursor and programmable error detection could be implemented. This issue I'd like to add some more "neat" features.

Have You Got the TI$?

First I'd like to explain an important feature about the PET: the built-in clock. The PET keeps track of what time it is automatically. It uses two special variables to do this: TI and TI$.

TI$ is a string variable which contains the time in the format "hhmmss" on a 24-hour clock basis. TI$ is set to "000000" when the PET is turned on. Thus, if TI$="001053" the PET has been on for 10 minutes and 53 seconds.

TI is the count of the number of "jiffies" since the PET was turned on. A "jiffy" is one sixtieth of a second. Thus, if TI=30, the PET has been on for ½ a second.

TI$ can also be set to a specific time of day. This allows you to set it to the correct time of day (so you can use the PET for a $795 digital clock!). For example, if the current time is exactly 7 p.m., you would execute the statement TI$="190000" (19 oclock is 7 p.m. on the 24-hour clock). Note that you must set TI$ to a numeric string of length 6. For example, if you want TI$ set to 1 a.m., you set TI$ to "010000", not "10000".

Note that variable TI can not be directly set, but that it varies according to TI$. Thus, by setting TI$ to "000000" (not just "0") you set TI to 0. (Variable TI is numeric; it is a count of the number of jiffies since the PET was set to a time of "000000"). If you set TI$ to "010000" you set TI to 216000.

Timing:

You can use TI and TI$ to time things. For instance, you can require a person to press a key within a certain amount of time. E.G.:

```
10 PRINT"PRESS A KEY WITHIN THE NEXT SECOND"
20 T=TI: REM set T to the current time
30 GET A$
40 IF TI-T>60 GOTO 100: REM time up?
50 IF A$="" GOTO 30: REM no key pressed
60 PRINT"VERY GOOD!"
70 END
100 PRINT"TOO LATE!!"
110 END
```

Line 30 will GET the next character from the keyboard. Line 40 checks to see if one second (60 jiffies) has passed since line 20 was executed. Remember that line 20 sets T to the current time. Thus, the expression TI-T will be equal to the number of jiffies that have passed since line 20 was executed. Line 50 is executed if one second (60 jiffies) has not passed since line 20 was executed. It checks to see if A$="", indicating that no key was pressed in line 30. If no key was pressed, we go back to line 30. Thus, the program waits for one of two things to happen: either the user presses a key, or one second goes by, causing the computer to print out the message "TOO LATE!!".

You may also want the computer to "wait" a specified portion of time. For example, the program below prints out the alphabet very slowly. Line 40 is the timing loop, which cause the computer to "wait".

```
10 FOR I=65 TO 90
20 PRINT CHR$(I);
30 T=TI
40 IF TI-T<30 GOTO 40
50 NEXT I
```

Look in your Reference manual for info on function CHR$.

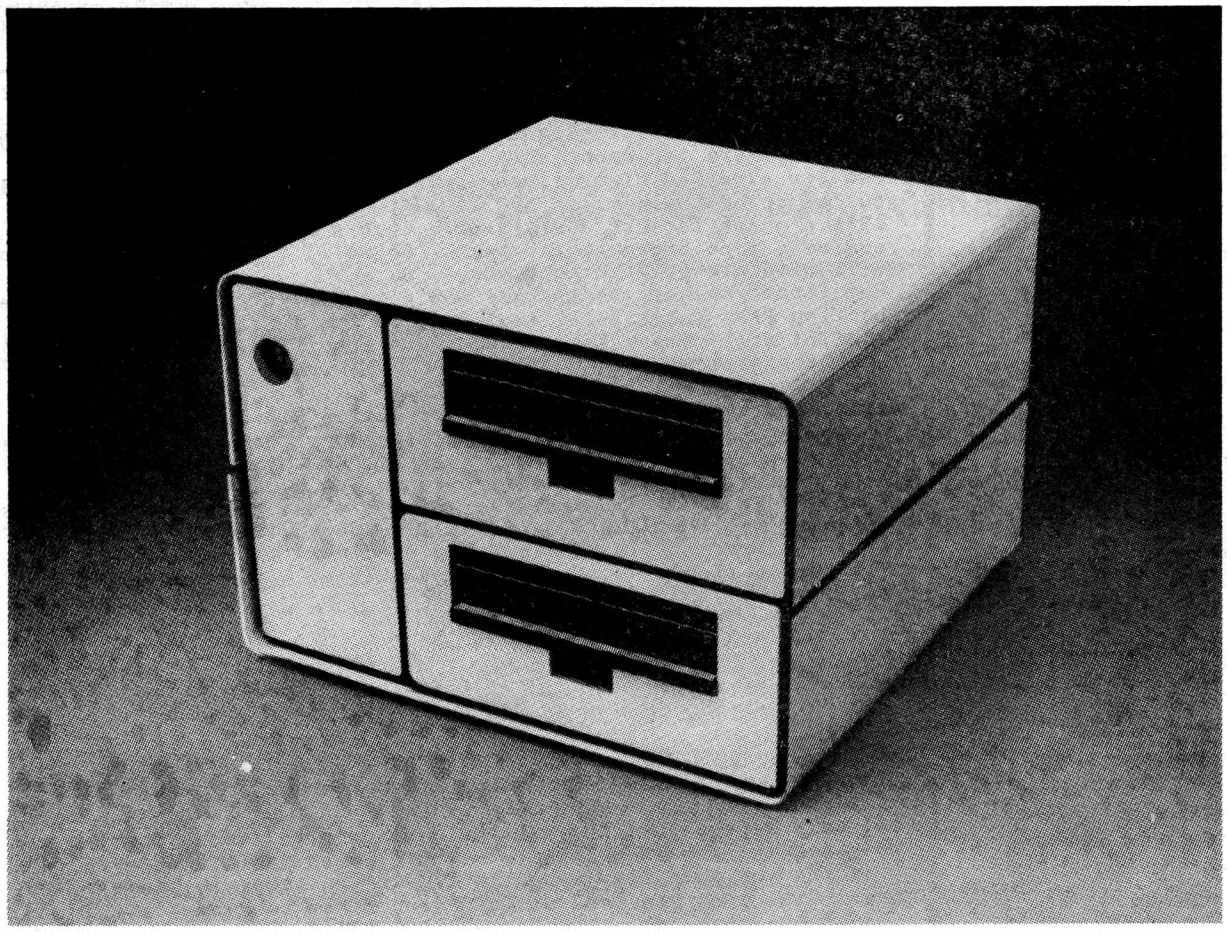
Line 30 sets variable T to the current time. Line 40 checks to see if TI-T is less than 30. IF TI-T is less than 30, meaning that less than ½ a second has passed since line 30 was executed, the program will GOTO line 40 again. Thus, line 40 will just GOTO itself until half a second has passed since line 30 was executed.

-CONTINUED-

WHY

BE CONTROLLED BY A TIMESHARING SYSTEM WHEN YOU CAN CONTROL A

CLUSTER/ONE?



Clustersharing is . . . several individual computers sharing a large program library, while preserving the individuality of each machine.

The CLUSTER/ONE™ Concept offers each BASIC user his own computer rather than a small share of one central processor.

Nestar Systems' CLUSTER/ONE creates a new dimension in low-cost computing, combining the power and economy of individual micro-computers with the ability to store and share a million byte source program library on two full-size flexible diskettes.

To find out more about CLUSTER/ONE, call us at 415/327-0125. Or write to Nestar Systems, Inc., 810 Garland Drive, Palo Alto, California 94303.

NESTAR SYSTEMS INCORPORATED

RESOURCES

-Continued-

S

R SCHMIDT
14 Tinker Rd
Nashua, NH 03060

SILVER BIRD SOFTWARE
3491 East Ave
Rochester, NY 14618

SKYLAB
VIA M Gioia 66
20125 Milano, ITALY

SMITH BUSINESS SERVICES
6724 Wynne Ave
Reseda, CA 91335

SOFTAPE
10756 Vanowen
North Hollywood, CA 91605

SOFT-ONE
315 Dominion Dr
Newport News, VA 23602

SOF-TOUCH
Box 422
Logan, UT 84321

SOFTSIDE SOFTWARE
305 Riverside Dr
New York, NY 10025

THE SOFTWARE EXCHANGE
Box 55056
Valencia, CA 91355

THE SOFTWARE SHOPPE
PO Box 271 Dept G
Berwyn, IL 60402

SOFTWARE INDUSTRIES
902 Pinecrest
Richardson, TX 75080

SPEAKEASY SOFTWARE
Box 1220
Kemptville, Ontario, CANADA

SPHINX/Milt Lee
1348 Rudgear Rd
Walnut Creek, CA 94596

WARREN SWAN
15933 S Grove Ave
Oak Forest, IL 60452

T

RAYNOR TAYLOR/QTRS 718
Charleston Naval Base
Charleston, SC 29408

TECHNICAL HARDWARE INC
PO Box 3609
Fullerton, CA 92634

3G COMPANY
Rt 3, Box 28A
Gaston, OR 97119

TOTAL INFORMATION SERVICES
PO Box 921
Los Alamos, NM 87544

V

VIP ENTERPRISES
PO Box 17011
Saltlake City, UT 84117

W

BOB WALLACE
PO Box 5415
Seattle, WA 98105

ROGER WALTON
Box 503
Bethany, OK 73008

-Continued-

-Continued-

This technique can be used to produce some neat effects. Consider this slightly more complicated program:

```
5 M$="WELCOME!"
10 FOR I=1 TO LEN(M$)
20 PRINT MID$(M$,I,1);
30 T=TI
40 IF TI-T<20 GOTO 40
50 NEXT I
```

Substitute any message for M$ in line 5.

REPEAT Key:

Last issue I presented some ways to use the GET command to input a string. There are many ways of using such ideas to make a program much easier to use. One such idea is to add the REPEAT key. On many more expensive computers, there is a special key on the computer keyboard labelled "REPEAT". When this key is held down along with another key, that second key is repeated for as long as it is held down. Thus, typing twenty "cursor ups" would be very easy. Some computers implement this by repeating a key if it is held down for a period of time, say a second. It is then repeated until you let up of the key.

It's a shame the PET doesn't have such a feature. But it would require a more expensive keyboard. So we'll do the next best thing: we'll simulate it with software.

But first you must understand one slightly complicated idea. The function PEEK (more fully explained in the JULY '78 issue of the GAZETTE) will return the contents ofa specified memory location. Thus, the statement:

```
A=PEEK(515)
```

will place the contents of memory location 515 into variable A. But memory location 515 is a special memory location. It contains information about the last key pressed. What that information is doesn't really matter to us right now. But you should know that if memory location 515 contains 255, it means that no key has been pressed since the last GET or INPUT statement. SO we now have a way of determing if a key is being held down (GET wont work for this application).

So, try the following program:

```
10 GET A$:IF A$="" GOTO 10
20 D=60
25 PRINT A$;: T=TI
30 IF PEEK(515)=255 GOTO 10
40 IF TI-T<D GOTO 30
50 D=6
60 GOTO 25
```

Line 20 sets D to 60. This means that the timing loop in lines 30 and 40 will wait 60 jiffies before repeating a key. So, keys are only repeated if they are held down for a second.Then, D is set to 6 and the key is printed every 6 jiffies (one-tenth of a second). D is the variable that controls the timing loop. In order to change the time required to hold down a key to repeat it, or to change the speed at which it repeats, simply change lines 20 and 50.

Line 30 checks memory location 515. If memory location 515 contains 255, then no key is being held down. Thus, a new character is gotten and D is set back to 60.

UPPER/lower case

Add the following lines to the program above to get it to reverse upper and lower case letters (i.e., holding down the SHIFT key gets upper case, letting go gets lower case):

```
5 POKE 59468,14: REM get lower case
15 GOSUB 100
100 REM REVERSE UPPER/LOWER CASE SUBROUTINE
110 A=ASC(A$)
120 IF A>64 AND A<91 THEN A$=CHR$(A+128)
130 IF A>192 AND A<219 THEN A$=CHR$(A-128)
140 RETURN
```

Reverse Upper to Lower

Reverse Lower to Upper

NOTE: The idea for the repeat key and the upper/lower case subroutine came from PET User Notes, Vol 1, issue 5.

I am currently writing a "friendly" text-editor that will have blinking cursor, repeat, reversed upper and lower case, cursor controled editing of lines, etc. Let me know if you have any ideas in this area.

As always, feel free to write to me at my address

Jon Staebell
5102 Arrowhead Dr.
Monona, WI 53716
(608) 222-4211

Special Introductory Offer

• • •

For only $5, you can receive the next 3 issues of

Calculators/Computers

THE HOW-TO-DO-IT MAGAZINE

Every issue will contain articles to help you use, program and enjoy your COMMODORE PET. Look for these ongoing series:

- Games and simulations - including a series of highly graphic games on the Commodore PET.
- Introductory and intermediate programming for the PET
- BASIC for Parents and Teachers - continuing series beginning with February 78 issue.
- Continuing lists of program sources
- How-to articles that will give you hours of enjoyment from your PET, and, enable you to share your computing know-how with family and friends
- Calculators/Computers Magazine also includes how-to articles for your calculator...

SUBSCRIBE TODAY! TAKE ADVANTAGE OF OUR SPECIAL INTRODUCTORY OFFER, OR SUBSCRIBE FOR ONE FULL YEAR – 7 ISSUES – for $12

Guarantee: If you are not satisfied at any time, we'll cancel your subscription and mail you a full refund on all copies still due you.

TO ORDER: Enclose check, B/A or M/C No. with expiration date, along with name and address, send to:

DYMAX, P.O. BOX 310, Dept. P, MENLO PARK, CA 94025

RESOURCES

-Continued-

SJ WHITE
429 So Cordova St
Alhambra, CA 91801

X AND Y ENTERPRISES
PO BOX 796
Huntsville, AL 35804

ZIATECH CORP
10762 La Roda Dr
Cupertino, CA 95014

ZZYP DATA PROCESSING
2313 Morningside
Bryan, TX 77801

LATE ADDITIONS:

AUTOMATED SIMULATIONS
PO Box 4232
Mountain View, CA 94040

CPU SHOP
39 Pleasant St
Charlestown, MA 02129

GPA Electronics
906 Blair Ave
Oakland, CA 94611

MICROSETTE
777Palomar Ave
Sunnyvale, CA 94086

QUANT SYSTEMS
PO Box 628
Charleston, SC 29402

REVIEW
BLOCKADE
$8
Smith Business Serv.
PO Box 1125
Reseda, CA 91335

The review for this real time starship battle game did not get done in time. Thus it will be reviewed next issue. It does exist.

MACHINE LANGUAGE IS FAST - TRY THIS:

```
10 REM PATTERNS - EARL WUCHTER
20 FOR M=826 TO 852
30 READ Y : POKE M,Y : NEXT M
60 POKE 1,58 : POKE 2,3
70 PRINT"OK"
80 GETA$:IF A$="" GOTO 80
90 C=ASC(A$)
100 IF C=18 THEN R=128-R : GOTO 160
110 IF C=17 THEN L=2-L : GOTO 190
120 IF C=17 THEN S=64-S : GOTO 150
130 D=C
150 D=D AND 191
160 IF D AND 128 THEN D=D AND 127 OR 64
170 D=D OR R
180 D=D OR S
190 POKE 59468,10+L
200 M=USR(D)
210 GOTO 80
220 DATA 32,167,208,160,0,132,48,169,132
230 DATA 133,49,165,180,198,49,145,48,136
240 DATA 208,251,166,49,224,128,208,243,96
260 THE REV, CRS DOWN, CRS RIGHT KEYS
270 FLIP/FLOP RVS, SHIFT, GRAPHIC/LWR CASE
```

BEGINNING MACHINE LANGUAGE PROGRAMMING by Steve Kortendick

If you ever need to fill consecutive locations in memory (up to 256) with the same character, try this little machine language subroutine. It is especially useful for clearing out a section of the screen VERY QUICKLY. It's a lot faster and cleaner than printing strings of blanks.

```
10 REM LOAD THE TAPE#2 BUFFER WITH MACHINE INSTRUCTIONS
20 FOR I = 826 TO 836:READ A:POKE I,A:NEXT I
30 DATA 169,*1,162,*2,157,*3,*4,202,208,250,96
```

where the *'s stand for the following:

*1:The numeric value of the character you want to propagate. (blank is 32)
*2:The number of repetitions.
*3 & *4:The starting location, computed as follows:

Take the first location you want filled with the character and subtract one. (Remember, the screen starts at 32768.) Convert this to hex. Reconvert the last two hex digits back to decimal. This is *3. Then convert the leading hex digits to decimal. That is *4.

As an example, say you wanted to start in the first screen position. That's 32768. Subtract 1 and convert to hex to get 7FFF. The FF then becomes 255, decimal, and goes into *3. The 7F is 127, and goes into *4.

So if you wanted two lines of x's across the top of your screen, the data line would read DATA 169,24,162,80,157,255,127,202,208,250,96.

Whenever you invoke the subroutine, use a SYS(826) in your program. If you want to change the values of the *1 - *4 mid-program, just poke the actual memory location, since the rest of the subroutine remains intact. That is, to change the above X's (24) to hearts (83), just use a POKE 827,83. Then invoke it with SYS(826).

For some crazy effects, try something like:

```
200 FOR J = 1 TO 100
210 POKE 827,256*RND(1):SYS(826):REM PICK A RANDOM CHARACTER 100 TIMES
220 NEXT J
230 POKE 827,32:SYS(826):REM CLEAR IT WITH BLANKS
```

If you want to decipher the machine code, it's the following:

LDA with *1 / LDX with *2 / STA (absolute + X format) into *3 & *4 / DEX / BNE (back 5 bytes to the STA) / RTS

Have fun with this. I think you'll like what it does for your programs.

REQUEST - REQUEST - REQUEST by Bill Bendoritis

Having reviewed a number of products which plug into the user port we found a need. Constantly connecting and disconnecting an edge connector is both difficult and hard on the PET. If someone would market a multiple edge connector which would allow you to plug in a number of items ie; speaker, joysticks, lightpen etc. it should sell very well. A connector similiar to Coyote's joystick connector would be great.

Speaking of requests- would somebody who cares about their customers, buy the rights to PET from Commodore. Through my association with the Gazette and the PET Computer Club in Madison, I've talked with a number of PET owners. The overwelming opinion of most is that the PET is a fantastic computer but the management of Commodore doesn't give a darn about those of us who have boughten them.

If it wasn't for the tremendous support of companies selling hardware and software for the PET, it would be about as useful as a lump of clay to someone new to computers. For as long as the PET has been on the market, you have to believe that if Commodore cared about their customers they could put out a decent instruction manual, or answer their mail. If I sound bitter, I am, and so are many other PET owners who know they own super machines but can't get any support from the jerks who make them. So how about it, why don't one of you companies who wants satisfied customers as well as profits, talk to Commodore about getting the PET before they totally screw-up a good thing.

```
90 REM A TEST PROGRAM FOLLOWS
100 PRINT"WHAT IS YOUR NAME?";
110 GOSUB9000:NAME$=R$
120 PRINT"WHAT IS YOUR AGE?";
130 GOSUB9000:AGE=R
140 PRINT:PRINT"NAME - ";NAME$
150 PRINT"AGE - ";AGE
8999 END:REM **************************
9000 R$="":RR$="":R=0:REM:INITIALIZE ANSWERS **** INPUT SOUND SUBROUTINE ****
9010 POKE525,0:WAIT525,1:GETRR$
9020 POKE59467,16:POKE59466,10:POKE59464,222:REM TURN TONE ON
9030 FORJ=1TO15:NEXTJ:REM TONE LENGTH
9040 POKE59467,0:POKE59466,0:POKE59464,0:REM TURN SOUND OFF/RECORDER BACK ON
9050 R$=R$+RR$
9060 IFR$=CHR$(13)THENPRINT"?";:GOTO 9000:REM RETURN WAS HIT WITH NO DATA
9070 PRINTRR$;:REM LAST KEY TYPED
9080 IFRR$=CHR$(13)THENR=VAL(R$):RETURN:REM R$ IS THE STRING / R IS THE NUMBER
9090 GOTO9010:REM GET NEXT CHARACTER
```

SOUND INPUT ***BY LEN LINDSAY***

```
30 REM R$ IS THE STRING
40 REM R IS THE VALUE OF THE STRING-
50 REM ALLOWING FOR NUMERICAL INPUT.
60 REM A CHECK COULD BE ADDED FOR
70 REM NUMERICAL INPUT TO ASSURE THAT
80 REM A NUMBER WAS ACTUALLY TYPED
```

Play~Grams

FOR THE 8K COMMODORE PET

SLOT MACHINE: The graphics produce a fully animated slot machine on the PET screen. With up to four players at a time, bets are made; the money disappears into the coin slot; lights blink; the handle comes down; the three reels spin randomly and stop in sequential fashion. If a pay-off combination results, coins are seen to drop into a tray. Jackpots overflow the tray with coins. The results of the betting for all players is continuously displayed on the screen. The odds are much better than for real machines.

SHARKS: This is a battle of skill between the player and three voracious sharks. The object of the game is to swim to the safety of shore without being devoured by one of the sharks. Unfortunately for the unwary player, one of the sharks is an especially hungry Great White Shark by the name of "CHAWS". To aid the player's watery escape he is given a spear gun which will shoot short-range spears in any of eight directions. The swimmer will soon discover that CHAWS is extremely hard to kill, and at times spears will merely make him angrier. This is a real-time contest.

HANGMAN: This is an animated adaptation of the old favorite word guessing game. In this version, rather than drawing a stick figure limb by limb for every wrong letter that is guessed, we have provided a pictoral representation of the folly of guessing wrongly. Starting with the poor soul at the bottom of a gallows, each incorrect guess makes him ascend another step toward his fate. From the top of the steps he moves resolutely until he is directly under the noose. He turns. Another wrong guess, and the poor hangee reaches up and secures the noose around his own neck. Now its just one more wrong guess and then.....

All three programs on one PLAY-GRAM cassette for only $9.95 postpaid. California residents add sales tax.

All cassettes are fully guaranteed to work on your PET.

Dealers prices available on request.

REICH ENGINEERING
635 GIANNINI DRIVE
SANTA CLARA, CALIFORNIA 95051
(408) 738-1388

PET MUSIC STANDARDS

Add sound to your programs!!! Here is how to add the speaker.

(This is the easy way, non complicated - for the non technical minded users):

1) Buy an edge connector for the User Port.
2) Buy a small batterry operated Speaker/Amplifier. Radio Shack has this for $10.95 in a plastic case with a small hole for you to plug in your cord. Buy the battery to power it (9 volt)
3) Buy the cord to plug into the Speaker/Amplifier ($1.95 at Radio Shack) This has the plug on one end to plug into your Speaker/ Amplifier and two open wires on the other end.
4) Notice the two wires on the end of the cord. One is the ground, the other is where the data for sound comes in. Notice on your edge connector that the pins are labeled 1-12 on the top row and A B C D E F H J K L M N across the bottom.
5) Connect the ground wire (copper colored wrapped around the sheilded other wire) to the bottom right side corner pin. (this is pin N) Solder it.
6) Connect the other shielded wire to the pin just before pin N (this is pin M) Solder it.
7)Note: the top and bottom pins are DIFFERENT.
8) Plug the edge connector into your computer. Plug the speaker/amplifier in.(Make sure you get the 9 volt battery for it too)
9) Turn on your computer, load the sound program and go. (Or just fool around with the 3 (Music) POKE locations.

NOTE: Please write and tell us anything you discover about music with the PET as well as any other areas.

**THUS STANDARD #1 is to use pins M & N to connect a speaker/amplifier to the User Port.

HERE IS HOW TO MAKE MUSIC:

Use a subroutine for your music sound effects. Start with:

```
2000 POKE 59467,16 : REM starts the Music Mode-Turns off Cassette
     recording system. You cannot record (SAVE) or LOAD a program now.
2010 POKE 59466,10 : REM this is for tone -- from 1 VERY MELLOW to
     255 very sharp.
2020 POKE 59464,115 : REM this is the pitch. From 1 very high (you can
     not hear it) to 255 lowest.
2030 POKE 59467,0 : REM Turns off Music mode and returns your Cassette
     recorder operational again.
2040 POKE 59466,0 : REM just to be safe return this back to 0.
```

The above played one note and turned it off right away.

**STANDARD #2 (VERY IMPORTANT) is ALWAYS turn the music mode off after the sound is done. Do not wait till the end of the program. If someone stops the program early it is important that their recorder be operational. END every Sound subroutine with:
POKE 59467,0 : POKE 59466,0

Now try this:

```
3000 POKE 59467,16
3010 POKE 59466,10
3020 FOR P=1 TO 255
3030 :POKE 59464,P
3040 NEXT P
3050 POKE 59467,0 : POKE 59466,0
```

NOTE: all your sound routines should end with line 3050 (with your own line number of course)

Send us listings of neat sound effects. We can start a Computer Music Exchange. Send us your songs on tape and we will send you copies of songs other people send in.

BITS & PIECES

**When saving a program on tape add the 'RVS' to your program name. Then when you read it back it will print the name on a white background making it easy to spot.
S A V E " (RVS) N'A M E " (RETURN)

**To see what's in memory try this:

```
:FORI=639TO660:?CHR$(PEEK(I));:NEXT
```

Harvey Sherman mentioned this little line.

PETS HINT by Jon Staebell

One of the greatest ways to make programs more interesting is to add sound effects. To a space war game you can add futuristic laser sounds, while to your more serious programs you can add sounds to warn of improper input and alarms to wake you up, or remind you about the dinner in the oven. The neccessary info on adding sound to your PET can be found in this issue of the Gazette. However, what is needed is some concise, easy to use subroutine to make creating sound effects easier. I believe I have a start in this area. If you have any improvements, please be sure to send them to the Gazette. I hope these ideas will help you.

Sound Effects: An Example

Here is a little program that will make an interesting little sound:

```
 10 POKE 59467,16:POKE
59466,51
 20 FOR I=1 TO 3
 30 FOR J=20 TO 235 STEP 5
 40 POKE 59464,J
 50 NEXT J
 60 NEXT I
 70 POKE 59467,0 :POKE
59466,0 :POKE 59464,0
 80 END
```

In line 10 POKE 59467,16 turns the music mode on (it also disables your tape unit, so we should remember to turn the music mode off when we're done). POKE 59466,51 sets the pitch of the music to 51. All this has been explained in the Gazette before. (And better too!)

Lines 30 through 50 are a loop which creates an interesting sound. The loop sends out a tone of 20, then 25, then 30, all the way up to 235. This means the sound starts out high and ends up very low - sort of a "zoom" sound. Now, since it is enclosed in the I loop (lines 20-60) it is repeated 3 times. Thus, a "zoom zoom zoom" sound is created.

Line 70 turns the music mode off. This is very important, as noted above.

All of this is very good. However, most of our programs quickly run out of memory - we just can't afford to take up 7 lines of code for every sound we wish to create.

-Continued-

BEST PET BET YET!

A COMPLETE LINE OF MICROCOMPUTER ACCESSORIES INCLUDING ...

THE PET MEMORY EXPANSION UNIT THAT SIMPLY PLUGS IN

-8k additional static RAM
-Plugs into PET's external memory expansion port
-Built in heavy duty regulated power supply
-Completely assembled,wired,burned-in and tested
-Attractive cabinet complements PET's appearance
-Illustrated user's manual

PEM-8K PRICE: $297,PLUS $6.00 SHIPPING

QUALITY CASSETTES

-Phillips style cassette
-Error free(for densities used by home computers)
-Norelco box(2 piece hard plastic)
-50 feet C-10,(5 minutes)

BOX OF TEN,WITH LABELS: $14.95,PLUS $1.45 SHIPPING

PROTECT YOUR COMPUTER FROM DUST AND SPILLS

-Heavy duty cloth backed vinyl
-Custom fitted
-Rugged heavy duty stiching
-Corded seams
-Available in gold,olive, chestnut and black

PRICE PET COVER 18.95 plus $1.25 SHIPPING
TRS-80 COVER $9.95 plus $.75 SHIPPING
Other covers available. Write for details.

BLANK LABELS

-No advertising
-No printing
-Mark with ballpoint, felt-tip,rubber stamp, or typewriter

60 cassette labels, 60 box labels (10 Red,10 Green, 10 Blue,10 Yellow & 20White)

PRICE: 60 Labels,$4.80

HIGH UTILITY SOFTWARE FOR YOUR PET

PEM — CALCULATOR @ $ 7.95

The PEM - CALCULATOR provides a wide range of math and financial functions including:

- N!
- Trigonometric
- Logarithms
- Anti-logs
- Inverse functions
- Hyperbolic functions
- Interest
- Periodic payments
- Present value
- Annuity
- Sinking fund

The PEM - CALCULATOR is a reverse Polish stack operated calculator written in BASIC for the PET®'s 6502 micro-processor and requires 12K of memory.

MICRO-SET© I (Basic Utilities) @ $ 14.95

SET©, which stands for Software Engineering Tool, allows the user to manipulate other programs in a very convenient fashion. MICRO-SET© I provides the following functions in a manner designed and tested for ease of use:

CREATE TAPE — makes an ASCII file copy of program, subroutine or collection of lines for addition to another program.
ADD FROM TAPE — uses an ASCII file tape made by Create Tape functions to add previously stored lines to the program presently in the computer.
DELETE — removes from your program all lines numbered between limits you specify.
PROGRAM INFO — reports the number of lines in your program, first and last line numbers, and the number of bytes free.
RENUMBER — change line numbers in a range you specify to new numbers starting with a number you designate, increasing at a step size of your choice. Provides information for manually changing targets of GOTO, GOSUB and IF - - - THEN statements.

8K of user memory required

NOTES

Virginia residents add 4% tax

Prices effective Jan 1, 1979

Foreign and air shipments extra

Volume discounts available

PET is a product of Commodore Business Machines, Inc.

INTERNATIONAL TECHNICAL SYSTEMS, INC.
P. O. BOX 264, WOODBRIDGE, VIRGINIA 22194
WE ACCEPT VISA AND MASTER CHARGE
CUSTOMER SERVICES, RICHMOND, VIRGINIA (804) 262-9709

FILE MANAGER
RELIABLE DATA FILE READING/WRITING/EDITING

```
100 PRINT"FILE MANAGER 3 - DENNIS CUMBERTON,
102 PRINT"5086 SILVER HILL CT, SUITLAND, MD 20028
110 REM***DENNIS CUMBERTON,5086 SILVER HILL CT, SUITLAND, MD 20028,301-736-4415
120 PA$="":PB$="":PC$="":PD$="":PE$="":I=0:J=0:K=0:L=0:N=0:Z$=""
130 PRINT"[CLR,2DOWN,RVS]R[RVSOFF]EAD OR [RVS]W[RVSOFF]RITE OR [RVS]N[RVSOFF]EITHER?
135 POKE525,0:WAIT525,1:GETA$
140 IF A$="R" THEN790
150 IFA$="N" THEN1070
160 GOSUB1380:SYS889:REM AUTO REPEAT"":I=0:J=0:K=0:L=0:N=0:Z$=""
170 PRINT"[2DOWN]UPPER CASE Q([Q]) SIGNALS THE END"
180 PRINT"OF YOUR INPUT. PRESS ANY KEY TO GO":POKE525,0:WAIT525,1:GETA$
190 PRINT"[CLR]":REM**WORD PROCESSOR
200 FOR I=1TO240
210 PRINT"[RVS]*[RVSOFF,LEFT]";:GETP$:IF P$=CHR$(34) THEN P$="'"
220 IFP$=CHR$(13) THEN PRINT" ";
230 IF P$=""THEN PRINT"[SPACE,LEFT]";:FORQQ=1TO30:NEXTQQ :GOTO210:REM*CURSOR
240 IFP$="[Q]" THEN670
250 PRINTP$;:PA$=PA$+P$:NEXTI
260 FOR J=1TO240
270 PRINT"[RVS,A,RVSOFF,LEFT]";: GET P$:IFP$=CHR$(34) THEN P$="'"
280 IF P$=CHR$(13) THEN PRINT" ";
290 IF P$=""THEN PRINT"[SPACE,LEFT]";:FORQQ=1TO40:NEXTQQ: GOTO270:REM*CURSOR
300 IF P$="[Q]"THEN670
310 PRINTP$;:PB$=PB$+P$:NEXT J
320 FOR K=1 TO 240
330 PRINT"[RVS,X,RVSOFF,LEFT]";:GET P$:IF P$=CHR$(34) THEN P$="'"
340 IF P$=CHR$(13) THEN PRINT" ";
350 IFP$=""THEN PRINT"[SPACE,LEFT]";:FORQQ=1TO50:NEXTQQ: GOTO330:REM*CURSOR
360 IFP$="[Q]"THEN670
370 PRINTP$;:PC$=PC$+P$:NEXT K
380 FOR L=1 TO 240
390 PRINT"[RVS,Z,RVSOFF,LEFT]";:GET P$:IF P$=CHR$(34) THEN P$="'"
400 IF P$=CHR$(13) THEN PRINT" ";
410 IF P$="" THEN PRINT"[SPACE,LEFT]";:FORQQ=1TO60:NEXTQQ:GOTO390:REM*CURSOR
420 IF P$="[Q]" THEN670
430 PRINTP$;:PD$=PD$+P$:NEXT L
440 GOTO670
450 REM***SUBROUTINE TO NAME FILES***
460 GETA$:IFA$=""THEN460
470 PRINTA$;:F$=F$+A$:IFA$=CHR$(34)THEN RETURN
480 GETA$:IFA$=""THEN480
490 PRINTA$;:F$=F$+A$
500 IF A$=CHR$(13) THEN RETURN
510 GOTO480
520 REM**USER EDIT SECTION
530 IF PD$=""THEN PRINT:PRINT"DO YOU WANT TO ADD 6 LINES? (YES OR NO)";:GOSUB650
540 IF PD$=""ANDA$="Y"THENPRINT:GOSUB1380:SYS889:GOTO380
550 GOTO620
560 GOSUB650:REM SELECT TAPE 1 OR 2 (TO READ
570 IFA$="Y"THEN OPEN 1,2,0,F$:GOTO840
580 RETURN
590 GOSUB650:REM TO SELECT TAPE 1 OR 2 (TO WRITE)
600 IFA$="Y"THEN OPEN 1,2,1,F$:GOTO760
610 RETURN
620 PRINT:PRINT"DUMP? (YES OR NO)":GOSUB650
630 IFA$="Y"THEN690
640 GOTO120
650 GET A$:IF A$=""THEN650
660 RETURN
670 SYS889:RESTORE:REM**DUMP AND PRINT SUBROUTINE**
680 PRINTCHR$(13);PA$;PB$;PC$;PD$
690 REM **WRITE TO A FILE**
700 PRINT"[2DOWN]FILE NAME? ";
710 F$="":GOSUB460
720 IF F$=CHR$(34) THEN F$=""
730 REM**PRINT:PRINT"[DOWN]TAPE 2 OPTION? (YES OR NO)":GOSUB590
740 PRINT:PRINT:OPEN 1,1,1,F$
750 Z$=F$
760 PRINT#1,Z$;PA$;PB$;PC$;PD$;
770 CLOSE 1:GOTO980
```

-Continued-

-Continued-

The Answer: Subroutines!

If we did have seven lines of code for every sound we wanted, there would be a lot of repetition. All the various sound routines would be almost exactly the same. The only difference would be in some of the numbers. So why don't we create a general subroutine? We could then set special variables, called parameters, to the values we wanted played. Then, when this general subroutine is called, the correct sound effect will be played.

Here is an example of such a subroutine:

```
 4900 REM ** VARIABLES USED
IN THE SOUND SUBROUTINE **
 4910 REM Z1= TONE OF NOTES
PLAYED
 4920 REM Z2= NUMBER OF TIMES
TO REPEAT THE SOUND
 4930 REM Z3= STARTING PITCH
#
 4940 REM Z4= ENDING PITCH #
 4950 REM Z5= STEP NUMBER FOR
PITCH LOOP
 4960 REM
 4990 REM *** SOUND
SUBROUTINE ***
 5000 POKE 59467,16:POKE
59466,Z1
 5010 FOR Z8=1 TO Z2
 5020 FOR Z9=Z3 TO Z4 STEP Z5
 5030 POKE 59464,Z9
 5040 NEXT Z9
 5050 NEXT Z8
 5060 POKE 59467,0:POKE
59466,0:POKE 59464,0
 5070 RETURN
```

This subroutine could be even more memory efficient by deleting the REM statements in lines 4900-4990. Also, the entire suboutine can be compressed into only two lines by using multiple statements per line and by squeezing out extra spaces.

All you do to use this subroutine is set the parameter variables (Z1, Z2, Z3, Z4, and Z5) to the desired values, which will determine the sound produced.

(Note that you can use variables which are more descriptive (such as "PITCH") instead of the variables Z1,Z2, etc. But I wanted to use variables which would not ordinarily be used in any of your programs. Feel free to use whatever variable names you wish.)

Here is an example of a use of this subroutine. It produces the same sound as the previous program.

-Continued-

ZZYP-PAX

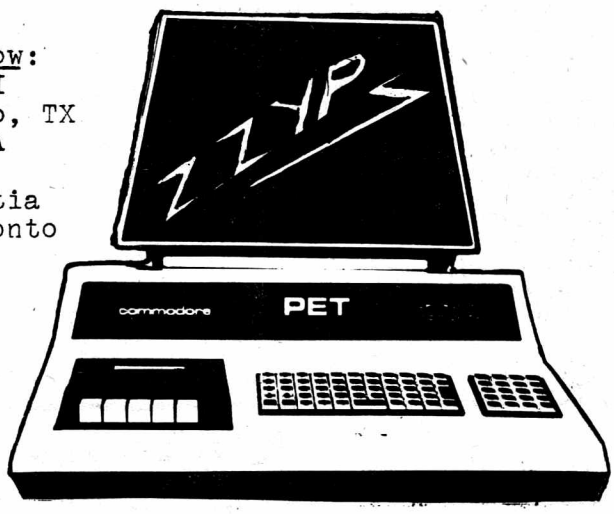
A cassette with two games
An educational booklet to encourage and improve
your programming skills.

● ZZYP-PAX No. 1 IRON PLANET and HANGMAN
DARLING! WHAT TOOK YOU SO LONG? exclaims the princess if you can rescue her from the laser sword wielding Dark Prince. Select a name for your trusty robot. PET graphics are used to enhance the word guessing game of HANGMAN. Explanations given of memory-mapped graphics and other techniques such as flashing messages and time delays.

●● ZZYP-PAX No. 2 BLACK BART(Poker) and BLACK BRET(Blackjack)
Transform your mild-mannered PET into one of these mean-mouthed gamblers from the old Wild West. Customize the gambling strategy,peek at BLACK BART's hand with the instuctions from the booklet.

●●● ZZYP-PAX No. 3 FOOTBALL and BLOCK!
PET graphics are used for the football field and scoreboard and you can see the ball move up and down the field. BLOCK! pits both strategy and reflexes against either the PET or a friend. Press the Magic Transporter key and you get another chance, even if cornered.

<u>See your dealer if listed below</u>:
The Madison Computer Store, WI
The Computer Shop, San Antonio, TX
The Computer Systems Store, VA
JADE Electronics, CA
Kobetek Systems,Ltd. Nova Scotia
The Home Computer Centre, Toronto
(Dealer Inquiries Invited)



- - - - - - - - - - - - - -

ZZYP Data Processing
2313 Morningside
Bryan, TX 77801

I enclose $9.95 each for the following ZZYP-PAX

ZZYP-PAX No. 1_____, ZZYP-PAX No. 2_____, ZZYP-PAX No. 3_____

Total $_____

Name:_____

Street:_____

City, State_____ZIP_____

-Continued-

```
780 REM**OPEN FILES FOR READING**
790 PRINT:PRINT:PRINT"FILE NAME? ";
800 F$="":GOSUB460:POKE59468,12
810 IF F$=CHR$(34) THEN F$=""
820 REM**PRINT:PRINT:PRINT"TAPE 2 OPTION? (YES OR NO)":GOSUB560
830 PRINT:PRINT:OPEN 1,1,0,F$
840 FOR I=1 TO 240
850 GET#1,Q$:IF ST>0 THEN960
860 PRINTQ$;:PA$=PA$+Q$:PE$=PA$:NEXTI
870 FOR J=1 TO 240
880 GET#1,Q$:IF ST>0 THEN960
890 PRINTQ$;:PB$=PB$+Q$:PE$=PB$:NEXT J
900 FOR K=1 TO 240
910 GET#1,Q$:IF ST>0 THEN960
920 PRINTQ$;:PC$=PC$+Q$:PE$=PC$:NEXT K
930 FOR L=1 TO 240
940 GET#1,Q$:IF ST>0 THEN960
950 PRINTQ$;:PD$=PD$+Q$:PE$=PD$:NEXT L
960 CLOSE 1
970 PRINT" PRESS [RVS]G[RVSOFF]O";:GOSUB1110
975 REM   MAKE THE FIRST LETTER OF EACH
976 REM   CHOICE REVERSE FIELD
978 REM   AS IN LINE 970
980 PRINT:PRINT"AUDIT, REDUMP, CONTINUE, LOWER CASE,     GRAPHICS OR ESCAPE?"
990 GETA$:IF A$=""THEN990
1000 IFA$="L"THENPOKE 59468,14:GOTO990
1010 IFA$="G"THENPOKE 59468,12:GOTO990
1020 IF A$="E"THEN520
1030 IFA$="A"THENPRINTCHR$(13);PA$;PB$;PC$;PD$;:GOTO990
1040 IFA$="R"THEN690
1050 IFRIGHT$(PE$,1)="*"ORLEFT$(PA$,1)="*"THEN1090
1060 GOTO120
1070 FORN=1TO320:PRINT"BYE";:NEXTN:FORT=1TO1200:NEXTT:PRINT"[HOME]":POKE59409,52
1080 FORT=1TO2000:NEXTT:SYS64824
1090 PRINT"[3DOWN]LOADING NEXT FILE ON AUTO COMMAND":F$=""
1100 PA$="":PB$="":PC$="":PD$="":I=0:J=0:K=0:L=0:N=0:GOTO830
1110 POKE525,0:WAIT525,1:GETG$:REM*PAGER
1120 IF G$="G" THEN POKE59468,12:RETURN
1130 IFG$="L"THEN POKE59468,14:GOTO1110
1140 IFG$<>"G"THEN1110
1150 REM**TAPE 2 COMMANDS ARE AT 730         AND 820**
1160 REM**REMOVE THE [REM**] AND THE    PROGRAM EXPANDS FOR TWO TAPE RECORDERS.
1170 REM**WHEN NAMING FILES THE
1180 REM**USE OF SINGLE QUOTES MARK (")
1190 REM**AS A FILE NAME WILL CAUSE AN
1200 REM**UNNAMED FILE TO BE CREATED OR
1210 REM**ANY FILE TO BE READ
1220 REM**28NOV78
1400 DATA208,12,169,0,141,119,3,169
1410 DATA90,141,120,3,208,25,238,119
1420 DATA3,173,120,3,205,119,3,176,14
1430 DATA169,6,141,120,3,162,255,142
1440 DATA 3,2,232,142,119,3,76,133,230
1450 FORI=889TO947:READJ:POKEI,J:NEXTI:RETURN
```

AUTOMATIC REPEATING KEYS
Contributed by The Software Shoppe

Here is a short program which will add an expensive feature to your PET. By trapping the system hardware interrupts, this program will time how long a key is held down. If a key is held down longer than 1.5 seconds, it will repeat itself at the rate of 10/sec. After running the Basic program, the feature can be enabled or disabled anytime by typing SYS(889). The tape drives need the interrupt linkage, therefore, the repeat feature must be disabled before using either tape drive. The program resides in the tape #2 buffer and will be destroyed if you use tape #2. SYS(64824) (system reset) will not destroy the program, but it will disable the auto-repeat feature.

```
10 DATA 120,56,169,233,237,26,2,141
15 DATA 26,2,88,96,173,35,2,201,255
20 DATA 208,12,169,0,141,119,3,169
25 DATA 90,141,120,3,208,25,238,119
30 DATA 3,173,120,3,205,119,3,176,14
35 DATA 169,6,141,120,3,162,255,142
40 DATA 3,2,232,142,119,3,76,133,230
45 FOR I=889 TO 947
50 READ J
55 POKE I,J
60 NEXT I
65 PRINT"SYS(889) WILL ENABLE AND DISABLE"
70 PRINT"THE AUTO-REPEAT FUNCTION."
75 END
```

-Continued-

```
10 Z1=51:Z2=3:Z3=20:Z4=235:Z5=5:
   GOSUB 5000
20 END
```

(The subroutine may of course be in any line numbers you wish. Simply change the GOSUB number in line 10.)

The two programs are functionally equivalent. However, it is much easier to add a new sound to the second version. Add this line:

```
15
Z1=51:Z2=5:Z3=10:Z4=100:Z5=10:
GOSUB 5000
```

Subroutines Within Subroutines

Using a general sound subroutine can significantly cut down on memory usage. However, you can cut down on memory requirements even more (if you use these sounds many places in your program) by making the line of code that calls the general sound routine a subroutine itself.

In some programs I have created a set of values which produce neat sound effects. They are very similar to lines 10 and 15 above. However, I make them subroutines. Consider this set of statements:

```
4000 REM THESE STATEMENTS
CREATE SOUND EFFECTS
4010::Z1=51:Z2=3:Z3=20:Z4=235:
Z5=5:GOSUB 5000:RETURN
4020::Z1=51:Z2=5:Z3=10:Z4=100:
Z5=10:GOSUB 5000:RETURN
4030::Z1=51:Z2=1:Z3=195:Z4=235
:Z5=.5:GOSUB 5000:RETURN
5000 (line 5000 is the sound
      subroutine given
before)
  ...
  ...
  ...
5070 RETURN
```

Now to hear the sound produced by line 4030, all we do is GOSUB 4030 and the sound is produced. This system has two advantages: 1) It makes it easier to create sound at different places in the program. Simply include a GOSUB where you want the sound produced. 2) All the sound subroutines are located in one area in your program. Thus, if you want to change one particular sound you only have to change one line, no matter how many times it is used in the program.

-Continued-

FLOPPY DISK FOR PET*
S100 ADAPTOR FOR PET*
ALL IN ONE

EXS100 -

COMBINATION FLOPPY DISK CONTROLLER AND S100 BUS ADAPTOR

FLOPPY DISK: 1771 LSI Controller- SA400 Minifloppy ,80 KB
IBM 3740 Format (Compatible with other systems)

S100 ADAPTOR: Memory Expansion Port to S100 Bus
Fully Buffered , Address Mirroring
Proven 6502/S100 design, Full S100 Control

COMPLETE DISK SYSTEM ++

PACKAGE 1 — $799.95

SA400 Minifloppy- 80kb
EXS100 Disk Controller
Disk Box, Disk Power Supply
Cassette Software

PACKAGE 2 — $895.00

SA400 Minifloppy- 80kb
EXS100 Combination Board
Disk Box, S100 Power Supply 8v@6A
3 Slot S100 Motherboard ±16v@1A
Cassette Software

PACKAGE 3 — $1195.00

SA400 Minifloppy- 80kb
EXS100 Combination Board
S100 Mainframe, S100 Power Supply 8v@10A
10 Slot S100 Motherboard ±16v@2A
Cassette Software

EXS100 BOARD — $ 349.95

COMPLETE ASSEMBELED TESTED

Adder for ROM based software.....$60.00

ORDERS NOW BEING ACCEPTED FOR JANUARY & FEBRUARY DELIVERY

CGRS MICROTECH
P.O. BOX 368
SOUTHAMPTON, PA. 18966

(215) 757-0284

P E T H I N T S by JON STAEBELL

POKEing the screen:

The POKE command will place a value at a specific location in memory. The form of the statement is :
POKE L, V
where L is the address number of the memory location and V is the value put at that location. Either L or V or both can be variables.

We can use the POKE statement to display characters on the PETs screen. You see, the display is regarded as an area of memory. The first spot on the display, the upper left corner, is location number 32768. Thus
POKE 32768, 1
will put a 1 in location 32768. Try that statement and see what happens.

What??? A "1" is not displayed in the left top corner? Well of course not. You see, "1" is the "code" for the letter "A". "49" is the "code" for a "1". Experiment with these codes.

WARNING: the second number in the POKE statement (V) should be between 0 and 255.

If you want to display at some other location on the screen, just increment the first number on the POKE statement. (Add 1 for every space to the right on the line. Add 40 for every line down. Note that the last screen location is 33767. That is because there are 25 lines with 40 characters on each line, totalling 1000 characters.)

We can make up a short subroutine to display the character specified by variable C at line number L, position P. The subroutine would look like:

```
1000 POKE 32768 + (40*(L-1))+(P-1),C
1010 RETURN
```

I leave it to you to figure out how it works. (Remember that if you want L=1 and P=1, then we want to have nothing added to the beginning location 32768, that is why 1 is subtracted each time)

Try this:

```
100 FOR L=1 TO 25
110 :FOR P=1 TO 40
120 ::C=C+1:IF C>255 THEN C=1
130 ::GOSUB 1000
140 :NEXT P
150 NEXT L
160 END
1000 POKE 32768+(40*(L-1))+(P-1),C
1010 RETURN
```

or this:

```
100 FOR I=0 TO 999
110 :C=C+1:IF C> 255 THEN C=1
120 :POKE 32768+I,C
130 NEXT I
140 END
```

Try them both and see! Can you tell why they are the same basic program?

PEEKing at the display:

In addition to being able to POKE something on the screen, we can use the PEEK function to look at what is on the screen. Correct format is:
PEEK(L)
where L is the location number you want to examine. This is like that for POKE. Thus, the statement
C=PEEK(L) will assign to the variable C whatever is at the location L. Remember, this will not be the character that is shown on the screen at position L, but the code for whatever character is at location L.

Type a * in the top left corner of your screen. Get there by hitting the key labeled HOME. So, type [HOME] * [RETURN]
Now enter this statement:
PRINT PEEK(32768)
The response should be the number 42. Evidently 42 is the code for whatever is at location 32768 (And you know that is a *). Now try this statement:
POKE 32808, 42
What happened?

Now you have a way of finding out the code for any character. Just clear the screen (Hit [SHIFT][CLR] at the same time) and put the character in the upper left hand corner. Then PEEK at that location:
PRINT PEEK(32768)
and find out what the code for that character is.
(Note: there are easier ways of doing this. Send us your easiest method)

PEEK and POKE can provide the basis for many fascinating games. For example, try analyzing the SNAKE game available through the PET CASSETTE EXCHANGE.

-Continued-

(Note: If you really understand this idea of a subroutine calling a subroutine - nested subroutines - then you may want to try this: Change the GOSUB 5000 statements in lines 4000-4030 to GOTO 5000 statements, and delete the RETURNS in lines 4000-4030. Can you see how this is functionally the same thing as before?)

Finding Interesting Sound Effects:

Here's a program to input the parameter values and then play them (assuming line 5000 is the sound subroutine). Use it to find interesting sound effects. If you find any, write down the values you used for later use.

```
 10 INPUT"TONE";Z1
 20 INPUT"# OF TIMES TO
REPEAT";Z2
 30 INPUT"BEGINNING PITCH";Z3
 40 INPUT"ENDING PITCH";Z4
 50 INPUT"STEP SIZE";Z5
 70 GOSUB 5000:REM 5000 =
SOUND SUBROUTINE
 80 PRINT:GOTO 10
```

Sound Effect Exchange:

Once you find an interesting sound effect, send in the parameters you used, and the method you used (if different than the one just presented), plus a short description of the sound to the Gazette, and maybe Len will print the most interesting.

I hope that someone will take my ideas here and try to create a better system. Send in your results to the Gazette.

Jon Staebell
5102 Arrowhead Dr.
Monona, Wi 53716

Location 513 is part of PET's clock. Try this delay:

POKE 513,0 : WAIT 513,9

This gives a slight pause.

Location 516 tells you if the shift key is held down. (1 if down, 0 if up)

Location 515 tells you which key is down. (255 if none) Works more than once for same key stroke.

ASCII Keyboard for your PET™

MODEL KBIF-3 Price: $175-

- Full NEW ASCII Keyboard with interface, plugs into PET™ and ready to use. (Keyboard case optional).
- Reccgnize all upper and lower case charactors, numeric, punctuations and repeat key.
- 90% of all GRAPHICS are implemented.
- PET™ keyboard can be used simultaneously.
- No modifications to the PET™ necessary.
- Completely assembled and checked out with 90 days warranty.

MODEL KBIF-2 Price: $100-

- Interface only with upper and lower case charactors, numeric, punctuations, repeat key and 90% graphics.
- Auxillary power, +5V & -12V for your own ASCII keyboard.
- Jumper selectable for data strobe polarity.
- One ribbon cable and one connector included.
- 3½ X 4" PC board that plugs into your PET™.

MODEL KBIF-1 Price: $80-

- Interface only with upper case charactors, numeric and punctuations. Curser control set implemented.
- No graphics and repeat key.
- Other features same as KBIF-2.

MODEL S100BC Price: $85-

- PET™ to S100 Bus Converter.
- Interface to most of the S100 static RAM, EROM memory boards and I/O Controllers.
- Onboard voltage generators for +20V & -20V DC.
- Powers upto 32K of S100 memory from PET™ power supply.

WE accept checks, money orders, VISA & MASTER CHARGE CARDS Personal checks takes 2 weeks to clear. Please add $6-for KBIF-3 and $3 for others to cover shipping & handling within U.S.A. Allow upto 6 weeks for delivery. SEND FOR FREE SPECS.

EXCEL Company

P. O. BOX 1147
EL CERRITO CALIF.
U. S. A. 94530
Tel:(415) 465 4240

DEALER ENQUIRIES ARE WELCOME

Notes on PET Music -- Tim Onosko

Thanks to J.R. Kinnard, Austin, TX, Frank Alexander, Swarthmore, PA, and, particularly, SPHINX, the San Francisco PET Users Group (East Bay), the PET now has a voice. This application will literally stun those whose PETs have sat mute on their desk tops.

Programs in the Cassette Exchange now include sound versions of Chase (elaborate effects), Pop Shot (a shooting gallery game), Star Trek (sci-fi sound effects), and the Music Program from the Users Notes, issue 4. In addition, I have written a program to compose 4-bar melodies (the PET does all the composition), a program to directly key in melodies up to 100 notes long (similar to the program that will be included on Parker Brothers' MERLIN hand-held game, this fall), and have added sound effects to my Concentration game. These last three programs will also be available through the exchange.

So that other users can begin adding sound to their programs, here are the basics of how it's done.

POKE 59467,16 sets the 6522 chip to a "free running" state, and readies the PET for the sound mode.

POKE 59466,51 generates a very pleasant square wave. Also try values of 10, 14, 15,and 85. These are the values that generate the most pleasant tones in at least two different ranges.

POKE 59464,0 is silent, but the values 1 to 255 return different frequencies (notes) in descending order. Here are the values for musical note equivalents: (read down)

BØ=251 (B below first C)	B=124
C=237 (first C)	C1=117 (C above first C)
C#=224	C1#=111
D=211	D1=104
D#=199	D1#=99
E=188	E1=93
F=177	F1=88
F#=167	F1#=83
G=157	G1=78
G#=149	G1#=73
A=140	A1=69
A#=132	

To impliment the system, use CB2 and Ground off the paralell user port. I use a cheap ($10) transistor-radio-like amplifier that I bought from Radio Shack. It's no bargain, but it carries its own 9-volt battery, has a volume control and can sit next to the PET. (By the way, the Radio Shack clerk got very annoyed when I started asking him about the limitations of the TRS-80....) You can also plug the PET into any other amplifier by attaching the shield lead of the input cable (for the amplifier, hi-fi, etc.) to the Ground connection on the user port, and the inside lead (wire, not braid) to the "hot" connection of the cable's plug and CB2.

When things are hooked up and ready to go, you can try these two short programs:

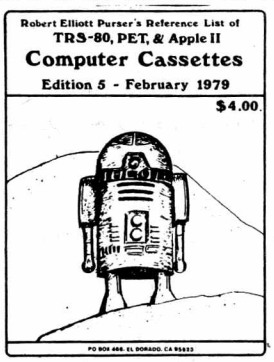
```
10 POKE 59467,16:POKE 59466,51
20 LET X = INT (255*RND(TI)+1)
30 POKE 59464,X
40 FOR I = 1 TO  250: NEXT I
50 POKE 59464, Ø
60 FOR I = 1 TO 250: NEXT I
70 GOTO 20
```

```
10 POKE 59467,16:POKE 59466,10
20 FOR I = 1 TO 10
30 FOR U = 255 TO 1  STEP -1
40 POKE 59464,U
50 NEXT U
60 NEXT I
70 POKE 59464,Ø
```

REMEMBER: To return the cassette functions (They're inactive in the music mode) turn everything off by POKEing everything back to 0.

COMPUTER CASSETTES

PET software directory-buy from: Robert Purser, PO Box 466, El Dorado, CA 95623. $2 for NOV / $4 for FEB



Everyone seems to be writing programs for the TRS-80, the PET, and the Apple II. There are so many cassettes for these computers that you need a computerized reference list to keep track of them all.

Robert Elliott Purser has been compiling his list of these computer cassettes for over a year. The list has more than 1,000 cassettes for sale or trade from over 100 sources. His list is now being published quarterly and every issue seems to double in size. The February '79 edition will be expanded to include photographs of the computer's display screen for some of the programs so you can see what the program will do on your computer.

If you want to receive this computer cassette reference list every quarter, send $12 for a one year's subscription. Single copies are $4 ppd. Dealers discounts are available.

The November '78 issue was an introductory half-priced edition. While the supply lasts, you can receive a copy for only $2 ppd.

Send your check to Robert Elliott Purser, P.O. Box 466, El Dorado, CA 95623

DR. DALEY

presents

---

the
finest in software
for
PET

*** the current list ***
has over 60
different tapes.

Write for it or
ask your PET
dealer if he
carries DR. DALEY'S
software.

DR. DALEY

425 Grove Ave.
Berrien Springs, MI 49103

Phone (616) 471-5514
Call Sunday thru Thursday
Noon to 9 PM Eastern Time

S-O-U-N-D CONVENTIONS

PET can make sounds in many ways. Follow these easy conventions to remain compatible with other PET users. Use pin N (ground) and M (sound line) of the user port (middle connector in back). M & N are the bottom right corner pins. Hook these into a speaker / amplifier. To turn on sound capabilities POKE 59467,16. The pitch varies from 1-255 as the value of X in POKE 59464,X. Three octaves of the pitch are available via POKE 59466,Y (Y=15 or 51 or 85). ALWAYS turn off the sound as soon as it is done with:
POKE 59467,0 : POKE 59464,0 : POKE 59466,0
Rumor is that Commodore is adopting our conventions for sound now. Their explanation is said to be similar to our past article.

REVIEW - COMPUTONE - Microsignal - $14.95

This sound system has a very attractive, good sounding speaker. It gets its signal from the I/O port. Instead of a battery it receives its power from the second cassette port. The connectors are extra and if purchased from Microsignal w/speaker, come attached.

There are (5) pages of documentation on programing sound. They are very good. One complaint is there is no volume control. Microsignal suggest using location and direction of the speaker to change the sound you hear. This is a pain! They should raise the price to cover a volume control. Microsignal has programs for the PET that make use of their sound system.

- Bill Bendoritis -

EDITORS NOTE: The Computone is a very goodlooking speaker which needs no batteries to operate. But it has no volume control. Since it is pretty loud that is a nuisence. It is compatible with our music conventions however, and it is what I use now (with a piece of cardboard taped over the speaker to lower the volume).

REVIEW-MUSIC BOX-$49.95-New England Electronics

Have you ever felt the urge to compose great melodic masterpieces? If this secret fantasy is limited by a tin ear or any other musical handicap, then NEECO's MUSIC BOX is for you. The MUSIC BOX comes with a speaker-amplifier which is directly soldered to an edge connecter. This edge connector is then plugged directly into your PET. You need to know absolutely nothing about soldering, electronics, or witch-craft to use the MUSIC BOX. The speaker-amplifier which came with our MUSIC BOX was the standard unit many PET users got from Radio Shack. However, NEECO is now reportedly sending out a nicer unit, which mounts directly inside your PET.

In addition to the raw hardware you need to make music, NEECO includes a couple of programs which will allow you to compose, edit, store, and play your musical creations. It should be considered to be a text-editor, only with musical notes instead of text. Everything you need to help you compose those tunes is included. You can play one particular page of music, a group of pages, or individual notes within that page. Editing your creation is a simple matter. Anyone who wants to compose music on their PET should buy this MUSIC BOX.

I have two complaints however. My first complaint is that the sound I got was not particularly good. This was probably caused by two things: the battery was low, and the speaker-amplifier is awfully small. In either case, I would like to have been able to connect my own speaker-amplifier; this would allow some really far-out effects - imagine connecting such an orchestra to your stereo. But no such information was provided. My second complaint is in the manner that the MUSIC BOX is connected to the PET. They use different connections on the User port than we Gazette loyalists are used to. I would have preferred that they use the Gazette Standard: the M&N pins. But perhaps they had a reason for using different pins. Unfortunately, to use any of the sound games I currently have, I would have to switch back and forth between my current set up and the MUSIC BOX.

That switching back and forth has caused a lot of wear on the connector coming out of my PET. I almost wish that NEECO had not included the connector with the MUSIC BOX. I imagine, however that it would be a simple matter to unsolder the MUSIC BOX wires and then wire it to your own permanent connector. Of course, you must use the same pins if you want the music. You could also have wires coming out of the M&N pins (the Gazette standard) and just switch your speaker-amplifier between the two. All of which is a bother. I would prefer to have some standards.

But, all in all, the MUSIC BOX is superb. I recommend it to anyone who wants to compose PET music. review by Jon Staebell

REVIEW- MORSE CODE- $7.95- Dr Daley, 425 Grove Ave, Berrien Springs, MI 49103

This program uses Pins M&N on the user port for sound (abiding by our conventions). The program allows you to type in any message and it then sends the message via your speaker. Not only can you send morse code but this program will help you learn morse code. It will send 50 random characters. Then it will print on your screen what it sent. The WPM (words per minute) can be varied from 1 to 30. There also is a special mode which sends the morse code for each key as you hit it. A good program for beginning morse coders.

REVIEW-STAR FIGHTER/ASTEROID-$10-ZZYP DATA- 2313 Morningside, Bryan, TX 77801

STAR FIGHTER is a STAR WARS simulation. The screen lights up with the sights of your laser gun. You steer your ship to get the enemy fighter in your sights and fire! If you hit the ship, it explodes in an amusing animated scene. In ASTEROID, you try to manuever your space ship up through a group of horizontal moving asteroids. It is not easy to win, but not too discouraging. Again, if you're hit, there is an animated explosion. Both of these games are exciting, easy to use, graphic, and addictive. Best of all, complete documentation is included. AND, they even include a listing of the machine language program used to update the graphics quickly. WOW! A must buy...

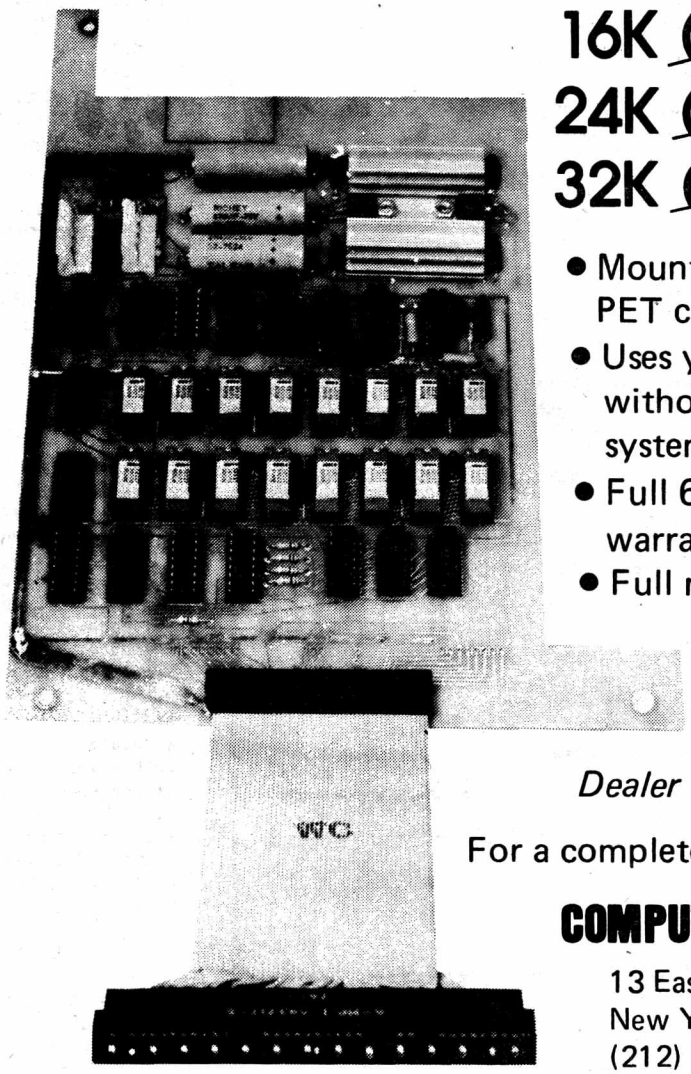
REVIEW-STARWAR/MISSLE-Software Industries 902 Pinecrest, Richardson, TX 75080

These two games are very interesting. However, they are not very easy to use. Because of this, I feel there are better games on the market. STAR WARS is very similar to the STAR FIGHTER game by ZZYP Data Processing (see review above). However, the ZZYP version is much easier to use. STAR WARS does not react quickly enough to your key presses, and the laser shots take too long to fire. While it is a good game, it could be better - which ZZYP's version is. MISSILE is another good game that suffers from a lack of easy to use features. Basically, you fire a cannon (pointed upwards) to hit some passing ships - a favorite game on many of the home video games. However, to point the cannon to the left, you press the 'L' key and to point the cannon to the right, you press 'R', which is extremely confusing since the L key is to the right of the R key. Confusing! They could have taken just a little more time and made it easier to use - like using the 1, 2, and 3 keys. I personally feel Pete Weiler's game 'Shooting Gallery', available through the Cassette Exchange, is a better program than Missle.
reviews by Jon Staebell

PME-1 improves your PET 3 ways

Now an expansion memory board for your PET

new low price



16K ~~($550)~~ $500
24K ~~($650)~~ $595
32K ~~($750)~~ $675

- Mounts easily inside your PET chassis
- Uses your PET's transformer without degradation of your system
- Full 6 month limited warranty
- Full manual with graphic display memory test that shows chip layout

Dealer Inquiries Invited

For a complete spec sheet write:

COMPUTER MART SYSTEMS

13 East 30th Street
New York, New York 10016
(212) 686-7923

PET is a registered TM of
Commodore Business Machines, Inc.

Delivery from stock.

ON DATA FILES:

The problem of data handling on the PET is not as severe in most applications as has been suggested, although Commodore's failure to provide information has forced us individually to find solutions. On the assumption that no single output (PRINT#) exceeds 191 characters (which is usually true for most uses), the following simple approach suffices.

Use a conventional PRINT#1 line for output. After each such set which might total 191 characters (or after each statement of the kind if you prefer) insert the desired interrecord gap. One easy way to do so is: POKE59411,53:POKE514,0:WAIT514,16 You may thereby make the interrecord gap longer than desired, but it will always be at least 16 jiffies, which is adequate. Input the data through the conventional INPUT#. Use the interrecord gap generously - it can't hurt.

I always use a backslash as the final record on a data tape. It is worth checking that you got the backslash when you should, or that you failed to get the last record to ensure a valid read. In typical coding, correcting for Commodore's blunder costs about 10% of the data read/write time, one extra statement, and about four GOSUBs. The following example writes and reads a 64-element array of strings.

```
100 REM WRITE X$ TO TAPE
110 OPEN1,1,1,NM$: PRINT#1, NM$
120 FORI=0TO63:GOSUB190:PRINT#1,X$(I):NEXTI
130 PRINT#1,"\":GOSUB190:CLOSE1:RETURN
190 POKE59411,53:POKE514,0:WAIT514,16:POKE59411,61: RETURN

200 REM READ X$ FROM TAPE
210 OPEN1:INPUT#1,NM$:PRINTNM$
220 FORI=0TO63:INPUT#1,X$(I):NEXTI:CLOSE1
230 IFX$(63)<>"\"THENRETURN
240 PRINT"DATA READ ERROR":END
```

Note that the (optional) POKE59411,61 is used in line 190. That is necessary since the RETURN on 190 is used to return to the main program from the write subroutine; without it, the cassette would be left on at the return. If you still have trouble reading the data tape, expanding line 220 and using GET# may help, but it approximately doubles the read time, a painful solution.

Due to the current tape reading problems of the ~~R&X~~ PET and to good practice in data tapes for exchange purposes, the following operations are recommended. I follow these conventions consistently!

1. Each tape has a first record of its name. (Since the PET does not give you the name when you find the file under program command, something like this is needed.)

2. When a record delimiter is required, use an upper-case backslash (left-half grey).

3. The last byte in the file is a backslash, my standard end-of-X delimiter.

4. Values in a numeric string are delimited by the number sign ("#"). I haven't had to use this yet, but I will shortly, and figure that this is a least-harm solution.

One other convention in my programs: An entry point at line 100 which presents the main program menu without disturbing data. This is especially important in the event of a keyboard entry error, inadvertant breaking with the STOP key, or in some cases a RETURN without data in response to an INPUT.

Michael Richter
2600 Colby Avenue
Los Angeles, CA 90064

GRAPHICS MODE

Don't assume that the User will have his PET in the Graphics mode. Use line 50 of your program to POKE in GRAPHICS or Lower Case.

```
50 POKE 59468,12 : REM GRAPHICS
or
50 POKE 59468,14 : REM lower case
```

REMEMBER

Start all your programs with line 100. The lines before that are reserved for identification and utility (like above, putting in the correct mode)

MULTIPLE STATEMENTS ON ONE LINE (for IF THEN)

```
250 IF I=3 THEN J=4:Q=3:GOTO 158
```

Note that you wanted 3 things to happen if I = 3. You do not have to write 3 separate lines. The line above will do 3 things if I=3 or will just go to the next line if I not = to 3

CMD COMMAND

The CMD command redirects the output of BASIC onto the device specified. EXAMPLE: the current BASIC program listing can be directed to tape #1 with: CMD 1 : LIST

PRINT# BUG

The PRINT# statement has a bug writing string variables. To correct this bug, place the quote symbol around each string printed. EXAMPLE:

```
 10 Q$=CHR$(34)
 50 R$=the string you print
 90 PRINT#1,Q$+R$+Q$
```

RECORD GAP BUG

The PRINT# command does not always allow a long enough inter record gap between tape buffer writes. Thus on long data files, records may be lost or misread by the INPUT# command.

Commodore's fix is:

```
 900 Q$=CHR$(34)
 910 PRINT#1,Q$+R$+Q$
 920 P1=P1+LEN(R$)
 930 IF INT(P1/191)<P2+1THEN970
 940 POKE59411,53:T=TI
 950 IF(TI-T<5 THEN 950
 960 POKE59411,61:P2=INT(P1/191)
 970 RETURN
       SAMPLE CALLING PROGRAM
 100 OPEN1,1,1:P1=0:P2=0
 110 FORI=1 to 1000
 120 R$=STR$(I)
 130 GOSUB 900
 140 NEXT I : CLOSE 1
```

REVIEW

SKYLES ELECTRIC WORKS
10301 Stonydale Dr
Cupertino, CA 95014

The BIG K-B KEYBOARD

This is the first full sized keyboard I have seen working with the PET. The nice thing is that it's price tag of $125 is the lowest of the 4 full sized keyboards I have seen announced. It has a numeric keypad with cursor functions. Every key on the PET has its match on this keyboard. Most characters available from the PET without shifting are likewise are available on this keyboard without shifting. Both keyboards are functional at the same time. We received it only 4 days before our trip to the printer with this issue so our next issue will contain a more comprehensive review.

The BIG-KB MEMORY

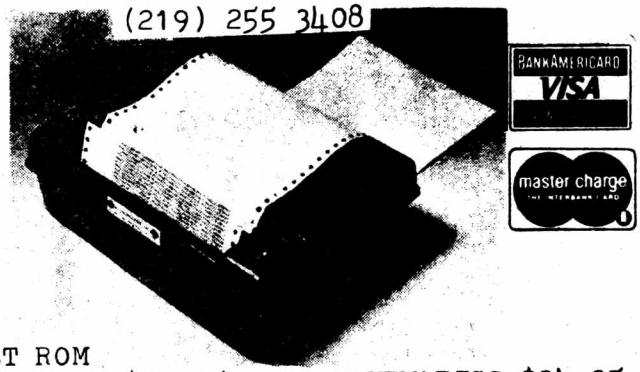
We also have the 8K memory board which sells for $250 ($450 for 16K). It's review will have to wait till next issue since we received it so late.

PET-EXPANDOR PRINTER FROM PETSHACK

PETSHACK Software House **P.O. Box 966**

Mishawaka, IN 46544

(219) 255 3408



PRINTER PRICE

WITH PET INTERFACE **$495**

- **Small size of 4.5"H x 12½"W x 9½" D**
- **Impact printing - 3 copies**
- **Prints 80 columns wide**
- **Print Cylinder - not a matrix**
- **Uses 8½" paper, pressure or pin feed**
- **Easy to maintain yourself, or return to us (maintenance manual supplied)**
- **Regular Paper - Coated paper not required.**
- **Lightweight, 11½ lbs. with cover**
- **Easy to carry with you - portable**
- **Prints 10 characters per second**
- **Single Case 64 Character ASCII Character Set**
- **Pin feed mechanism included**
- **Full Documentation included**

PET ROM
LISTINGS $19.95: PET SCHEMATICS $24.95
PET TO PARELLEL INTERFACE
with 5V .8A power supply. --$74.95
PET TO 2nd CASSETTE INTERFACE.--$49.95

This is the ideal, low cost, reliable, self maintained printer with which to complete your **PET** *system.*

SOFTWARE PROGRAM LIST ------ PRINTED BY THE PET EXPANDOR PRINTER ------

---

NUMBERAMA - NUMBER GUESSING GAME BASED ON 'MASTERMIND' ----5.95

STATES - HELP THE KIDS WITH THEIR GEOGRAPHY. MATCH STATES & CAPITALS.----5.95

MATH TUTOR - HELP YOUNGSTERS LEARN MATH IN AN ENJOYABLE WAY. ----5.95

6502 DISASSEMBLER & PEEK-A-BOO - DISASSEMBLE ROMS & MACHINE LANGUAGE PROGRAMS. DOUBLE CHECK YOUR HAND ASSEMBLED PROGRAMS AND DISASSEMBLE THE PROTECTED BASIC ROMS IN YOUR PET. PEEK-A-BOO PEEKS AT YOUR MEMORY AND DISPLAYS 25 SUCCESSIVE ADDRESSES IN ASCII, HEX, DECIMAL, & ACTUAL CHARACTERS. ---12.95

MAD LIBS - PARTY FAVORITE! HILARIOUS STORIES CREATED. ----5.95

WORLD CONQUEST - ADVANCED GAME OF STRATEGY. ----5.95

STARTREK - ALL-TIME FAVORITE WRITTEN FOR THE PET'S SPECIAL GRAPHICS. ----5.95

MORTAR - ADVANCED TECHNICAL GAME INVOLVING X-Y COORDINATES AND ANGLES TO DIRECT THE MORTAR SHELL TO THE TARGET. ----5.95

PSYCO ANNIE - TELL YOUR PROBLEMS TO PSYCO ANNIE AND GET AN INTERESTING AND PROVOCATIVE ANSWER. ----5.95

COMPUTER DERBY - EXCITING DERBY WITH FOUR EQUALLY MATCHED HORSES. UP TO FOUR PEOPLE CAN PLAY. ----5.95

MAILING LIST - FOR PERSONAL OR BUSINESS APPLICATIONS. VERY COMPREHESSIVE WITH FILE TO TAPE OR PRINTER. ----9.95

HOME UTILITIES - LOANS, SAVINGS, ELETRICITY, & MILES PER GALLON. ----9.95

MACHINE LANGUAGE MONITOR - WRITE MACHINE CODE. SAVE ON TAPE. ----9.95

REVIEW - CHECK MANAGEMENT / ADD 'EM UP - $7.95 -
JAMESTOWN SMALL COMPUTER SYSTEMS, 2508 Valley Forge Dr, Madison, WI 53719

CHECK MANAGEMENT

Check Management is more than a simple add and subtract routine. It will allow you to double check your figures in your checkbook to catch any mistakes. It will also reconcile your bank statement for you. BEST OF ALL it will help you see where your money went (it did disappear, didn't it?). It will let you set up accounts and either tell you how much you spent for each account as well as the percentage or you can tell it what percentages to assign each account.

It uses GET command for ease of use and doesn't have a distracting scrolling screen. When entering your checks and assigning them to accounts, each account and its account number is displayed at the top of the screen for easy reference.

This is a good way to start managing your money.

ADD 'EM UP

Add 'em Up is a great and fun MATH drill. There are good sound effects to let you know how you are doing. The sound abides by our conventions so if you hooked up your own speaker it will work.

You first choose the level of difficulty. If you choose easy, one digit number addition, you can choose to be timed to see if you can get 20 right in 90 seconds. That is an excellent way to learn the basics.

One interesting thing about the program is that it keeps track of RECORDS. This way you can try to make a new record for number right (or for the most wrong).

A very good educational program - and kids love it!

REVIEW - WAR GAMES PKG #1 - New England Electronics - $10 ea/$25 all 4

There are four highly graphic games. They are not particularly difficult although each allows you to vary the difficulty. To demonstrate the graphic capability of the PET these games are among the best. Younger persons or people into video games will enjoy these the most.

DEPTH CHARGE - You are controlling a destroyer shown at the top of the screen. A submarine is shown changing depths underneath you. You fire depth charges by hitting a number key. The higher the number, the deeper the depth charge detonates. You can vary the closeness needed for a kill.

BOMBADIER - You fly a Bomber shown as a plane on the screen. You drop bombs on an aircraft carrier shown as a rectangle moving under the plane. You can choose the height which varies the size of the rectangle. After dropping the bomb, the screen displays a side view of the ship showing the bomb dropping in front, back or a direct hit which causes the ship to explode.

ANTI-AIRCRAFT - In this game you drive a tank shown on the screen moving from R to L. An airplane comes at you from L to R varying its height as it flies. Your shot goes to different heights by which key you press to fire. You can change the difficulty by varying the number of hits it takes to down a plane. If you don't shoot it down it may either bomb you or make another pass.

DOGFIGHT - This is the least graphic but most difficult game. By using the key pad you can dive, fly level, climb, turn left, right or go straight. What you see is a sight which you try to line-up on a blip moving around the screen. You are limited by time and if you miss six (6) times you're shot down. You can vary the speed at which the blip moves to increase difficulty.

In all games you are given information such as, number of hits and success rate. Although they are similar, for the money, it is worth getting all 4 games for the variety. Since we received these games they have added sound which works with their speaker system. This would really add to the games.

- Bill Bendoritis -

REVIEW
MICROCHESS 2.0
$19.95
Personal Software
PO Box 136-L10
Cambridge, MA 02138

Chess for the PET!! At long last a chess program is available for the PET. The screen displays a (necessary) abstract representation of a chess board and pieces. Players may choose from 8 levels of play. At level 1 the PET makes its move in about 3 seconds. Of course it then isn't looking very far ahead. At level 8 the PET may take a minute to make its move (even 5 or 6 minutes if a complex situation arises). A clock at the side times each player.

The PET checks to see if your move is legal and if so moves your piece on the screen. You can exchange pieces with the PET at any time. Because of the range of IQ levels there is something here for everybody. The lower levels can be enjoyed by beginners. At the highest IQ the PET will give you a real run for the money.

Since the positions can be reversed at any time I played the PET against itself at IQ 8. It's opening move was quite unorthodox and the game progressed in a rather bizarre fashion. The result was a draw. All in all it's a very enjoyable game. At a price of $20, your enjoyment per dollar will probably be higher than any other game I can think of. I would rather spend $20 for one good game than $5 for half a dozen games of the Wumpus - Lunar Lander ilk. And who knows, maybe the next Bobby Fisher will get his start because his dad owns a PET with a chess program.

Review by Pat O'Donovan
chess player

REVIEW 2 programs - $10

ZZYP DATA PROCESSING -- BLACK BRET (BLACKJACK)

As with all their programs this one came with a short booklet, explaining the game and telling how to modify it to suit your needs. Some programming hints are also printed in the booklet.

You start with 250 dollars. 1 or 2 can play. The cards are drawn on the screen using PET graphics, but are small and use 2 numbers in opposite corners and 1 suit symbol in the middle.

At the beginning of each hand you are asked how much you want to bet. Then you are told how much money you have.

The computer plays a good game and shuffles the cards after every hand.

ZZYP DATA PROCESSING -- BLACK BART (POKER)

This game uses the same booklet as Black Bret. Lots of comments throughout the game make it interesting. He will not fold too often and plays for high stakes. You start with $1000 and $200 is the limit. Watch out for his bluffing you with a $100 raise.

The cards are drawn on the screen as in their other card game. PET tells you how much money you have as the hand and game progress.

The instruction booklet tells how to modify the program to suit your needs. You can change the limits or make BART a bigger bluffer.

It plays a pretty good and enjoyable game.

PERSONAL SOFTWARE -- POKER

Challenge the PET to a game of Poker. First the basics of Poker are explained. As to the betting, you can chose Fixed limits, Pot limits, or Increasing limit.

You start with 100 dollars. AS the game progresses you are continually told how much money you have, the POT holds and PET has listed at the bottom of the screen.

The computer helps you by telling you what you have in your hand. (ie. your hand=one pair). The cards are displayed beautifully using the graphics to its fullest extent.

The computer assumes the role of a cautious player. If you bid high PET may just fold that hand. If you wish PET to be more aggressive a slight modification can be made to the program. Watch out, PET will raise you at times, and you never know if it is just a bluff.

At the end of the hand PET shows you his cards and tells you what each of you have and who wins the hand. Another aid is that your cards are displayed with the highest cards to the left.

Don't be fooled. Although cautious, the PET does win. The cards are well displayed and a game of poker can be quite fun.

REVIEW-BLACKJACK-$9.95-CMS- 5115 Menefee Dallas, TX 75227

This an excellent version of the popular game of blackjack or 21. One person plays against the computer dealer and the cards of both are graphically displayed on the screen. The game is played by Las Vegas casino rules, which means that doubling down, splitting pairs, and insurance bets are permitted. Those blackjack enthusiasts who wish to practice their card counting may choose to have the cards dealt from 1,2, or 4 decks shuffled together. For the beginning player the program displays the total value of his cards when it asks if a hit is wanted. The beginner will also appreciate the understandable prompting and error messages. A running total of your winnings or losings is shown after each hand. If your losses become embarassingly high you can have them reset to 0. Four pages of clear instructions accompany the program.

review by Pete Weiler

REVIEW-BLACKJACK-$5-JK Johnson
9304 Emory Grv Rd, Gaithersburg, MD 20760

This version of blackjack allows as many as 5 people to play. The interesting graphics show the cards of a hand overlapping so that all hands, including the dealer's, can be shown simultaneously. The blackjack rules of the program are not standard. A natural pays twice the bet instead of 1½ times it, but the dealer wins all tie bets. One may double down only if the total of the first 2 cards is 10 or 11. With 3 or fewer players, pairs may be split. The dealer must stand with a total of 18 or more or with a 17 that does not include an ace counting for 11. With lesser totals the dealer may or may not stand; one of the players must make the decision. Thus a sixth person could play the dealer, although the program does not keep track of the dealer's winnings. There are bugs in the program. Occasionally it skips the play of one of the hands or displays the wrong point total for a hand. This program is not for the serious blackjack enthusiast, but is for those who want to have fun playing with a group of friends. --Pete Weiler--

REVIEW-BACCARAT-$9.95-CMS, 5115 Menefee, Dallas, TX 75227

Many versions of baccarat, also called chemin de fer, are played in casinos around the world. This program plays 2 versions, a Las Vegas one and an unnusual 'blackjack style' version. In both, two 2-card hands are dealt and each hand may receive a third card. In the Las Vegas version the rules strictly dictate how both hands are to be played. The only choice the player has is his bet. Before both hands are dealt he may bet on either hand or on a tie. The lack of choice during the play makes baccarat a dull game when not played for real money. In the 'blackjack style' version the player must bet on the 'table hand' but may choose whether or not this hand is to be hit with a third card. This is more interesting than the Las Vegas version but still is not as much fun as blackjack. The program itself is a good one with large, graphically displayed cards, running totals of your winnings or loses, and good prompting and error messages. (However there is a bug in a the house- limit-exceeded message.) In the 3 pages of instructions there is a confusing error in the rules governing the drawing of the third card, but this error does not appear to be in the program.

review by Pete Weiler

REVIEW - CASINO ROULETTE - CMS - $9.95

This is a great version of roulette. It is designed not only to play the game but to teach it, just the way it is played in a casino. The documentation is complete in every detail.

The displays shows the layout of the betting table, the 12 types of bets and their odds.

When you "spin" the wheel, an X moves from number to mumber on the betting table, stopping by the winning number.

The results of all the bets are shown and your purse is displayed. You then can play again or stop.

If you are going to Vagas and want to play roulette, this is a must.

--Bill Bendoritis

REVIEW - CASINO CRAPS - CMS - $9.95

This is the best version of craps we've seen. It has all the betting options of a real casino game. The documentation is extensive and not only tells what the different opeions are, but what the house odds are against you.

It is a real time version in that it continues making passes until the point is made. It gives you a few seconds in between passes to allow you to break in to make additional betts.

A tremendous game if you want to learn to play craps the way they do in casinos.

--Bill Bendoritis--

PET AND THE DUAL JOYSTICKS submitted to the PET GAZETTE by Chuck Johnson

The joystick manufactured by Atari® for their Home Video Arcade offers a very simple and superbly versatile remote input device for the PET and other micros with a parallel input port. In this article the author will propose an interface which accomodates two Atari joysticks and requires a minimum of electronic parts. A general-purpose subroutine allows the user to fully interpret joystick and button movements and includes ideas for more specialized applications.

WHAT'S A JOYSTICK?

The joystick concept evolved with the technology of airplane maneuvering. From the earliest controlled aircraft (somewhat post-Wright brothers) through the Viper fighter of Battlestar Galactica, the "broomstick-on-the-floor" has been the most popular steering device. Joysticks for video games and home computers are identical in concept and fall into two functional categories:

1. POTENTIOMETER - movement of the joystick turns two variable resistors; one senses up-down movement, the other senses left-right movement. Decoding the joystick position requires a resistance or voltage measurement to be interpreted by the game or computer.
2. SWITCH - Pushing the joystick in one direction closes a simple (SPST) switch. The game or computer senses the joystick position by checking the status (open or closed) of four switches - one each up, down, left, and right.

The Atari joystick is a switch-type device, with an additional push-button switch. This mechanism very easily attaches to the PET's parallel port (User Port), but...

WHAT'S A USER PORT?

The PET has several attachments for accessories on the back. One of these slots is the parallel input/output port, or User Port. In general, the User Port can send or receive eight electronic signals which are "high" or "low," according to TTL convention. (These signals may also be humanly interpreted as on/off, yes/no, or five volts/zero volts.) We will be using the User Port for input and in that mode all eight signals are normally "high;" our joystick(s) switches will force some of the signals to their "low" condition. We can pull any one of the signals "low" by attaching it to the "ground" line of the User Port. The switches in the joysticks will be wired to close the circuit between the "ground" line and one of the data bits.

HERE'S THE PLAN

Each joystick has four position switches and one push-button switch. We'll attach the position switches so that each one closes the circuit to one of the Port data lines. We'll wire the two push-button switches so that each one closes two circuits, instead of one, and pulls two data lines "low". This layout accommodates the full capabilities of two Atari joysticks and is very simple to physically assemble.

THAT'S GREAT, BUT HOW DOES A PET PROGRAM USE IT?

Conveniently, the PET looks at the User Port as just another eight-bit memory location. (Aha! You thought eight data lines were mere coincidence!) PEEKing at memory location 59471 reveals the status of the data lines as a binary number (a decimal range of 0 to 255). If all switches are open, then all lines are "high" and 59741 contains 11111111 (binary) or 255 (decimal). When a switch is closed, the bit corresponding to that line turns to a zero. If a joystick switch closes the first circuit, then 59741 would contain 11111110 (binary) or 254. If two switches on one joystick are closed (the push-button, for example), then 59741 would contain a number with two zero bits, say 11110011 (binary) or 243.

Once a program has performed these decoding steps, it can interpret the meaning of the various switch closures and proceed accordingly.

OK, LET'S PUT IT TOGETHER

To implement the two joystick interface we must establish an attachment standard and a decoding standard. The attachment standard provides the external connection and the physical means for inputting switch closures. The decoding standard is a BASIC subroutine which interprets the meanings of joystick switch closures for a program in execution.

-Continued-

JOYSTICK CONVENTIONS

In the last two issues of the PET GAZETTE we asked for input to help devise conventions for joystick use with the PET. We also wrote to several companies selling joysticks for the PET. Coyote Electronics sent us a sketch of how their units function. Tom Finley sent us skematics and pc board layout for his full resolution joysticks. Mike Louder is working on a method that would work well and also be easy to convert existing programs from keyboard input to joysticks. Chuck Johnson sent us an article explaining in detail his proposed method.

Chuck's article, PET and the Dual Joysticks, is printed just to the left (it is 3 pages long). Mike Louder's article will be in next issue. Coyote Eletronics' sketch is along side Chuck's article. Note that their method is similar to Chuck's, but their 'up' is his 'right'. Tom Finley's ideas and skematic were already printed in the PET User Notes. If there is room I will print it also.

REVIEW-JOYSTICK-Microtronix
by Bill Bendoritis

The pricing seems to be $40 for 1 joystick & 2 games and $20 for the 2nd joystick & another game. If you want them assembled add $10 each. [editors note: that would be $80 for 2 assembled joysticks with 3 games]

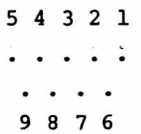
These are Fairchild joysticks which, in this reviewers opinion, are the best around because they can do more than any other joystick made. Some people find them hard to get used to, but once you do they are great. One connects to the IEEE port and one to the user port. They worked very well with the sample program included. They also had a test program to make sure the joysticks were working properly.

One very bad drawback was that there were NO instuctions on how to program them. Trying to figure it out by looking at listings of the program was very difficult. So if you intend to use only boughten software [from Microtronix] they are great, but if you want to write your own it will take alot of work.

[Editors notes: there are several styles of joysticks available. Both the Atari and Fairchild joysticks can tell 'up' from 'down' but can not tell a little bit up from way up. To them, up is up. A full resolution joystick can sense every little movement. This is more versetile, but in many cases not really needed. Tom Finley uses these 'full resolution' joysticks in his plans. Atari joysticks are the more widely used and are available from several places, including Coyote Electronics, Creative Software, Chuck Johnson, and probably Mike Louder. They are the stick type and work well sitting on the table or can be held in your hands. You only need one hand to operate them. -Continued-

JOYSTICK ATTACHMENT STANDARD -Continued-

The Atari Joystick terminates with a DB-9S connector; six of the nine circuits are used as follows:



DB-9PIN	FUNCTION
1	Up Switch
2	Down Switch
3	Left Switch
4	Right Switch
5	Not Used
6	Push-Button Switch
7	Not Used
8	Ground (common)
9	Not Used

A DB-25P connector will accept two joystick connectors; the DB-25 may then be wired to a User Port edge connector, according to the following table:

	JOYSTICK	DB-9S PIN	DB-25P PIN	USER PORT PIN	USER PORT FUNCTION
1.	UP	1	9	F	PA3
	DOWN	2	10	E	PA2
	LEFT	3	11	D	PA1
	RIGHT	4	12	C	PA0
	BUTTON	6	22	Diodes to E and F	PA2 and PA3
	GROUND	8	24	A	GROUND
2.	UP	1	1	L	PA7
	DOWN	2	2	K	PA6
	LEFT	3	3	J	PA5
	RIGHT	4	4	H	PA4
	BUTTON	6	14	Diodes to K and L	PA6 and PA7
	GROUND	8	16	N	GROUND

Pin numbers for the DB-25P are marked on the connector. User Port pins are on the bottom row of a 12 position edge connector. Proper polarization of the edge connector is strongly recommended.

Note that the buttons are wired through diodes to both the UP and DOWN functions of their joysticks (pins E and F and pins K & L). When a button is pressed, the PET data lines react as though the joysticks were pushed up and down simultaneously (an impossible condition for the position switches to generate). The decoding standard will, as we shall see, interpret this condition as a button movement. The diodes act as "one-way streets" for current flow and prevent the real UP and DOWN switches from closing both circuits.

Orientation of the diodes is very important. We want current to flow from the data lines to ground. When soldering the diodes in place, orient them with their cathodes ("banded" ends) connected to the joystick buttons (pins 14 and 22 on the DB-25P). If the user is not interested in using the buttons, the button lines may be left unconnected and the diodes omitted.

SOFTWARE DECODING STANDARD

To a great extent, the software to interpret joystick switch closures may be specifically written for each different application. The BASIC subroutine in this section is meant as a general purpose decoder for two joysticks and is by no means the most efficient (i.e. fastest). It performs all of the necessary tasks, however, and should be used as a guideline.

Here's the routine to decode five switches on two joysticks:

```
  100 REM INITIALIZE THE LOOKUP TABLE
  110 DIM JS (15)
  120 FOR I = 0 TO 15
  130 READ JS (I)
  140 NEXT I
  150 DATA 99, 99, 99, 0, 99, 7, 9, 8
  160 DATA 99, 1, 3, 2, 99, 4, 6, 5
    .
    .
19999 REM POLL TWO JOYSTICKS
20000 J1 = JS (PEEK(59471) AND 15)
20010 J2 = JS ((.0625*PEEK(59471)) AND 15)
20100 RETURN
```

-Continued-

-Continued-

Fairchild joysticks must be held in your hands. They have the added feature of being able to twist them, while Atari's have a push button on the top - good as a FIRE button. As Bill noted, dual joysticks need to use BOTH the user port and the IEEE port. Atari joysticks need only the user port. Unfortunately software written for one can not be used with the other. Our conventions will be for the Atari.

REVIEW
JOYSTICKS-$50
COYOTE ELECTRONICS
PO Box 101
Coyote, CA 95013

The price might seem steep, but this package is definately worth it You get 2 Atari joysticks, a very neat prewired, completely enclosed connector, extensive documentation and examples, and sample games. If you happen to own Atari joysticks, write to Coyote for just their connector and documentation.

The documentation is on cassette and gives very detailed explanations on how to program the joysticks. There also is a a test program to make sure that the joysticks are working properly. The games were Paddleball and Breakout. Both worked well. This is a very well put together package.
review by Bill Bendoritis

EDITORS NOTE: The Atari joystick rests on the table(or you can hold it in your palm) and you move a "stick". Many people prefer this. The fairchild joystick has to be held in you hand. You also can twist the handle besides moving it back and forth. A full resolution joystick will register and respond to even the slightest movement. This is much better than the other two, but involves more software to use it.

✱ Coyote has an excellent connector. No bare wires are exposed. Well designed.

The joysticks in our package from Microtronix were used, and had several nicks in them. See the Editors Ramblings for comments on Microtronix (be cautious).

Please write if you have ANY ideas on conventions for joystick use.

-Continued-

The routine returns "lookup table" values in J1 and J2 for joysticks 1 and 2 respectively. The calling program maybe written to take appropriate action based on these values. Readers familiar with User Port control will recognize memory location 56741, as Port A Data without handshake.

This subroutine uses four bits (PA0-PA3 or PA4-PA7) in decimal form (range 0 to 15) as an index to the "lookup table" in array JS. The values in the JS array correspond to the following joystick functions:

DECIMAL INDEX	BINARY	JOYSTICK	EXAMPLE VALUE
0	0000	--	99
1	0001	--	99
2	0010	--	99
3	0011	BUTTON	0
4	0100	--	99
5	0101	UP-LEFT	7
6	0110	UP-RIGHT	9
7	0111	UP	8
8	1000	--	99
9	1001	DOWN-LEFT	1
10	1010	DOWN-RIGHT	3
11	1011	DOWN	2
12	1100	--	99
13	1101	LEFT	4
14	1110	RIGHT	6
15	1111	CENTERED	5

The "example values" relate to the key layout on the PET numeric pad, i.e. joystick centered is "5", joystick UP and LEFT is "7", et cetera. Recall that the BUTTON entry is analogous to UP and DOWN switch closures. Impossible conditions are flagged with "99". Other tables may be developed to suit the user's needs. These modifications are reasonable for more specialized applications:

1. To use joystick 1 only, delete line 20010.
2. To use both joysticks without their pushbutton functions, change the fourth entry in the lookup table from "0" to "99" (line 150).
3. Make use of ON-GO TO statement.
4. Recode the routine in machine language.

SOUNDS LIKE FUN...WHAT DO I NEED?

The hardware for this project consists of two circuit connectors and four diodes, in addition to one or two Atari joysticks. The joysticks plug into the DB-25P subminiature connector, manufactured by ITT Cannon and several competitors. The User Port connector is a 12 position, dual readout edge connector, widely available. The suggested diode is a 1N914, which is a commonly used fast switching device. Actually any flea power diodes should work. Assembly is quick and requires soldering wires and diodes between the DB-25P and the edge connector; refer to the attachment standard. Be sure that the diodes are oriented correctly. Improper orientation will not damage the PET, but the joystick buttons won't respond as planned. Plug the edge connector onto the back of your PET (it's the center slot); be sure it's properly oriented. Plug your joysticks into the DB-25P. Turn the PET on and you're off and running!

As a service to interested joystick-ers who lack a source for parts, these items are available from the author:

User Port connector with polarizing keys	$ 3.50
DB-25P wired for 2 joysticks (4 diodes included)	3.50
Atari joystick	15.00
SNAKE program on cassette	2.00
Two joystick, both connectors, four diodes and SNAKE cassette	36.00

The SNAKE program was originally written by Pete Rowe of the Lawrence Hall of Science in Berkeley, and couldn't be better suited for two joysticks. The author has modified the SNAKE coding for joysticks and is distributing it with the permission of Pete Rowe and the SPHINX user group library.

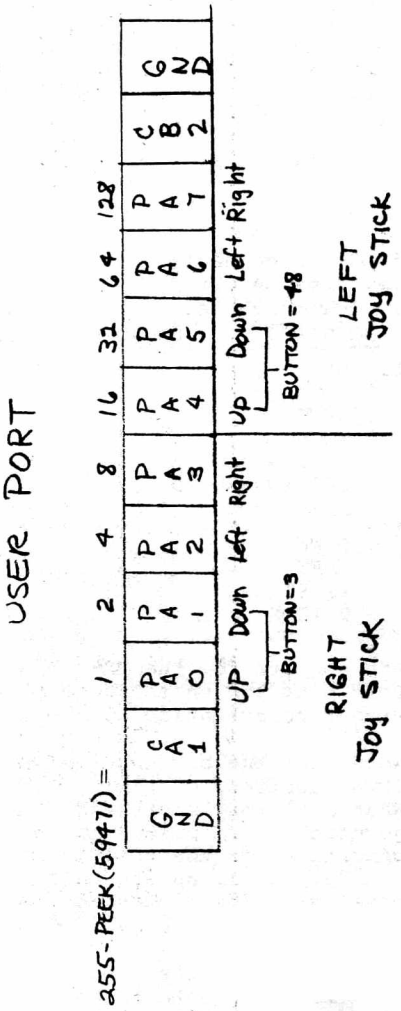
REBUTTAL AND DISCUSSION

...are strongly encouraged. All suggestions should be publicly aired. The author will gladly receive comments and/or parts requests over the telephone (415/278-6595 at reasonable PST hours), at SPHINX meetings, or by mail:

Chuck Johnson
17104 Via Alamitos
San Lorenzo, CA 94580

PROPOSED JOYSTICK CONVENTION by

COYOTE ELECTRONICS
P. O. BOX 101
COYOTE, CALIFORNIA 95013



In the table below are the values for left & right joy sticks.

right #####	left ####
0 - no movement	0 - no movement
1 - up	16 - up
2 - down	32 - down
3 - button	48 - button
4 - left	64 - left
8 - right	128 - right

A simple program example:

```
10 POKE 33225,122   <--puts : in middle
20 B = 33225          <--start position
30 PA = 255 - PEEK(59471)  <--look port
40 IF PA = 0 GOTO 10      <--no movement
50 IF PA = 1 THEN B=B-40        <--up
60 IF PA = 2 THEN B=B+40        <--down
70 IF PA = 4 THEN B=B-1         <--left
80 IF PA = 8 THEN B=B+1         <--right
90 POKE B,122 <--poke : in new position
100 GOTO 30             <--do it again
```

PERFORMANCE OF ON-GOTO

by Chuck Johnson, SPHINX

```
LIST
10 N=0
20 N=N+1 : PRINT "#";N;"[←]:  I"; : INPUT I
30 ON I GOTO 40, 50, 60 : PRINT "FALL THROUGH" : GOTO 20
40 PRINT "@40 I=1" : GOTO 20
50 PRINT "@50 I=2" : GOTO 20
60 PRINT "@60 I=3" : GOTO 20
READY.

RUN
#1:  I? 1
@40 I=1
#2:  I? 2
@50 I=2
#3:  I? 3
@60 I=3
#4:  I? 0
FALL THROUGH
#5  I? 4
FALL THROUGH
#6  I? π
?REDO FROM START
? 3.14159
@60 I=3
#7  I? 2.71828
@50 I=2
#8  I? -1
?ILLEGAL QUANTITY ERROR IN 30
READY.
```

The PET ON-GOTO statement has a few subtle undocumented traits that can possibly be used to the programmer's advantage. The accompanying program and sample run test ON-GOTO for a variety of conditions. (Note in the PRINT statement of line 20 that "[←]" denotes a single "cursor left" control.)

In the sample run, #1, #2, and #3 perform as expected: we input integer values of 1, 2, and 3 for I and the ON-GOTO branches accordingly.

In #4 and #5, however, we input positive integers which are outside the ON-GOTO branch list (i.e., 40, 50, and 60). First, note that these out-of-range values do not cause an error. Instead they "fall through" to the next executable statement. Second, that "next executable statment" is on the same line number as the ON-GOTO, separated by a colon. This contrasts with the more commonly used IF-THEN statement. When IF-THEN "falls through" (i.e., fails) the next executable statement must be on the next numbered line.

Looking at #6 shows that π (shift - ↑ , just above RETURN) is considered to be a symbol, rather than a numerical value. Further, #6 and #7 show that ON-GOTO automatically converts the argument value to integer and makes the conversion by truncation (rather than rounding-off).

In conclusion, ON-GOTO will accept and adjust for any non-negative values, but a negative argument causes an unrecoverable error, as shown in #8.

INVENTORY CONTROL

FOR THE 8K PET

IDEAL FOR THE TELEPHONE SALESMAN, INSTANT RECALL FOR COST, RETAIL PRICE, # ONHAND. REMOVE FROM STOCK AS SOLD, TELL'S WHAT YOU **NEED** TO ORDER, UNIT COST AND EXTENDED COST, TELLS YOU WHAT YOU ARE OVERSTOCKED IN, EASY TO UNDERSTAND INSTRUCTIONS. REQUIRES NO COMPUTER KNOWLEDGE. 39.95 (PLEASE SPECIFY # 1OR2 TAPE FOR DATA.)

SOFTWARE

ORDER BY STOCK #2550 INVENTORY CONTROL

MICRO COMPUTER INDUSTRIES LTD.

1532 E. Mulberry Suite H.

Fort Collins, Colo. 80524

303-221-1955

PET computer

REVIEW-ACCOUNTING PACK 1-$25-Sawyer Software

ACCOUNTING PACK I by Sawyer Software can be described in one word: Fantastic. Anyone who has prepared a balance sheet manually will have a slight heart murmur upon using the Accounting Pack. It is amazing that the program fits in 8K. It keeps track of the General Ledger, allows tape input and output, and prints several reports, including a Balance Sheet and an Income Statement (a/k/a Profit and Loss statement, Earnings statement, etc). Not only that, the tape comes with sample data immediately following the program. This allows you to test out the program and see how it works without actually inputing massive amounts of your own data.

The program is fairly easy to use. Unfortunately, the error messages and prompts for input are not very informative. This was obviously done to save space. A good reference manual would help with the cryptic messages. Unfortunately, therein lies my sole complaint: while the program is very good, the "documentation" (if it can be called such) is primitive, to say the least You are handed a set of 13 Xeroxed pages, stapled together. The instructions take you through all the various instructions, but they are not very well explained. And while all the neccessary information you would need to modify this program is in the instruction "booklet", it too is not very well written. I want to make it clear that Sawyer Software is not the only software company which has difficulty communicating in the English language; computer people are renowned for their lack in people to people communication skills. But if these people are going to sell a product, they should at least provide the consumer with the basic instructions needed to use that product. Those instructions should be written in a clear, concise manner. Sawyer Software obviously took a lot of time to develop the Accounting Pack; I wish they would have taken a little time (and pride) in their documentation.

On the whole, I would say the Accounting Pack is useful and could justify the price of a PET unto itself for any small business.

review by Jon Staebell

EDITORS NOTE: I felt the 13 pages of instructions and examples PLUS sample data on the cassette were quite adequate. The packaging may not be professional, BUT it is the program that counts, and IT is FANTASTIC.

REVIEW

-WORD PROCESSOR PROGRAM- CONNECTICUT MICROCOMPUTER- $29.50

We are now using this word processor to do this review as well as most of the articles printed by our Teletype 43. This program is very good. It allows you to make corrections as you type. You also can make corrections or changes later on. It then looks for any string in any line you specify and changes it to the string you request. It will center for you as well as allow you to format the output. (line lengths, spacing, margins) You can move whole blocks of text from one place to another.

TRY THIS

To avoid escaping from your program at an input point (by hitting return with no other data) you can open your keyboard as a device thus:

```
10 OPEN1,0:REM keyboard
20 GET#1,A$
30 PRINTA$
40 AA$=AA$+A$
50 IF A$<>CHR$(13)THEN20
60 RETURN:REM if you use it
as subroutine
```

Everything can be saved on tape, or printed on you IEEE printer. (Connecticut Microcomputer also sells an adapter for your PET so you can hook up any RS-232 printer. As it reads any of the data tapes you previously made, it prints the textfile on your screen. Your tape input can be inserted in the middle of an existing file already in the computer. It comes proffesionally packaged along with an excellent manual that includes many examples.

Anyone submitting articles for future GAZETTES may submit them on tape made with this program. In one word - EXCELLENT.

USE MODEL 15, 19, 26, 28, 32 OR OTHER INEXPENSIVE BAUDOT TELETYPE TO PRINT CONTENTS OF YOUR COMMODORE PET'S VIDEO SCREEN. COMPLETE INSTRUCTIONS, 256 BYTE PROGRAM LISTING AND SCHEMATIC DIAGRAM OF HARDWARE (3 IC'S AND 2 TRANSISTORS) ONLY $3. (WASH. RESIDENTS $3.16) SEND CHECK OR M.O. TO...AXECO INDUSTRIES... 13304-87 NE KIRKLAND, WA. 98033

REVIEW-PETFORTH-$35-Programma Consultants, 3400 Wilshire Blvd, Los Angeles, CA 90010

FORTH is a threaded language that is nice for those of us that are tired of the slowness of BASIC. Forth is quite a bit different than BASIC and will take a while to get used to its terminology. It's like a large HP calculator with a very large stack. Forth makes use of a dictionary where you define small tasks to perform. you define larger tasks in terms of the smaller ones you have previously defined. All these tasks are compiled as entered so it is extremely fast when executing.

Programma has done a nice job implementing Forth on the PET. There first version does not contain the complete standard dictionary of FORTH. They have solved that but are trying to compress it so it will fit in an 8K PET. Programma will include this version as a free update to version 1.0. The documentation is excellent. There are over 35 pages sent with it that describes all the commands with examples to get you started.

review by Dave Mehaffey

REVIEW-LIFE-$10-Smith Business Services

LIFE is not the most exciting, action-packed computer game available. But it is an intriguing program just the same. If you are really a LIFE addict, this cassette is a must for you.

The cassette comes with three programs all recorded on the first side. The first program is an attempt to explain the game of LIFE. It fails miserably. It poorly explains the rules of LIFE and doesn't even attempt to explain to the user how to get the other two programs into the computer and working. Throughout these three programs, the instructions are skimpy, poorly written, and non-user orientated. They offer little help. If you're not familiar with LIFE, forget this cassette.

If you are already familiar with Conway's LIFE, you will appreciate the next two programs. The first, "LIFE 40*25" is a simple LIFE program. You place the "seeds" (shift-Q) on the screen and then initiate the program by typing "GOTO 100". The program then generates the succeeding generations. This can be very fascinating to watch.

The third program, "LIFE 64*64", is a more sophisticated version of LIFE. It keeps track of the number of generations displayed and also allows you to "pause" the program to give you a chance to see whats on the screen before it disappears. It also allows for more "seeds" to be on the screen since it uses a smaller character for the "seeds". The quarter-square characters are used. By combining them (e.g. using the shift-question mark character) complex and large populations can be displayed. This is one of the finest versions of LIFE I've ever seen (and there are a lot!).

The really fascinating thing about these programs is the fact that they are written in machine language. The BASIC programs that come on the tape really POKE the program into memory and then cause it to be executed. This allows for MUCH faster generations. If you're interested in programming the PET in machine language, you might be interested in taking a look at these programs.

reviwed by Jon Staebell

LETTER!

Please excuse the somewhat facetious answer to your question on "standards". It is just that your wording, "...before it is too late," reveals the slightest hint of bias toward one expected answer.

In fact, however, except for the always-important requirement for good engineering and programming practices, including adquate readable documentation of any innovation or idea, I do not foresee the need to force "standards" on the Pet community beyond those inherent in the engineering of the machine.

For example, the two standards you set for PET music operation seem unnecessary to me, at least when called "standards" since they are both necessary for the operation of the machine, not merely efficient guides for communication with fellow cassette exchangerx.

STANDARD #1: (using pins M and N to connect the internal square wave generator to an external amplifier-speaker) I am sure you have also discovered you can make music (or interesting sounds, at any rate) by placing a transistor radio, tuned between stations, near the logic circuitry (i.e., next to the computer or ditting near your right hand on the keyboard) and running a program that uses long nested FOR loops. Is the standard designed to say exchange music programs should only use the square-wave music instead of this. Then it is a real standard. Or is it to require home-builders to connect only to pins M & N? In that case it seems unnecessary - a how-to-do-it suggestion instead of a real standard. (Oh yes, please tell your readers not to just connect speaker or earphones to CB2 and ground. You need the ~~speaker~~ amplifier to isolate the computer lest Terrible Things happen to the 6522!)

STANDARD #2: (turn off the music) is a special case of the Law of Subroutines, known to wilderness campers and machine language programmers alike: "Put things back the way you found them. No one else wants to clean up your trash." It is a good programming practice, not a special standard for music subroutines alone.

Do we want standards for the Pet, before it is too late, you ask? The hell with it, I say. Let's have some creative energetic anarchy to explore, discover, and report as well as we can the amazing things that can be done with the box from Palo Alto.

Dr.Steve Irving

From the Editor: It's letters like these that keep us on the right track. Thank you very much Dr Irving. We do hope you will write again. We hope the use of the word "conventions" rather than "standards" will more clearly express our aims.

Let's have some more letters like this one. --LEN--

REVIEW-KINGDOM-PERSONAL SOFTWARE

You are the ruler of a kingdom. Each year (1 turn) you must make decisions such as how much land to buy or sell, how much grain to use as food, and how many acres to plant. You receive a yearly report telling you the current price of land, how many acres you own, how much grain you have stored, and what your countries population is. You are told 3 constant factors: Each person needs 10 bushels per year to survive, each person can plant and harvest up to 2 acres, and each acre planted requires 3 bushels.

Your harvest will vary and you may encounter theft, riots and other events that reduce your land, population and grain. You do well if you can get the treasury balance over 10,000. (You begin with a random amount of about 2,000) If you can last 20 years you also have done well but not as well as making 10,000.

You lose if you are assasinated or all your people die. (You must be careful not to starve them)

REVIEW-MATH TUTOR-$5.95-PETSHACK

Math tutor is a program that will drill you (or your children) with math problms. The problems are displayed with huge digits inside an animated border. Very fancy. You can choose the type of problems you wish to do. This is a very good program, but it is a bit slow in responding to your answer. This is because the animated border takes time and it only checks if you typed in your answer in between each cycle of moving the border. If you would like faster response and don't mind not having the moving border you could change it so that it skipped the boarder routine. Messages flash across the top as you go -- congratulating you -- or advising you that you aren't doing to well. It even checks your errors to see if you were adding instead of multiplying etc. After every 5 problems it pauses and asks you what to do next. That is good. All problems are displayed horizontally. The multiplication sign is terrible. It looks like a checkerboard with 4 missing triangle sections.

REVIEW-COMPUTER DERBY-$5.95-PETSHACK

Computer derby is a simple horse race with four horses that race across your screen. Up to four people can play, each betting on a horse. The program keeps a running total of everyones money. You can't change players in the middle of the game. It is possible to bet on a non existant horse.

REVIEW-NUMBERAMA-$5.95-PETSHACK

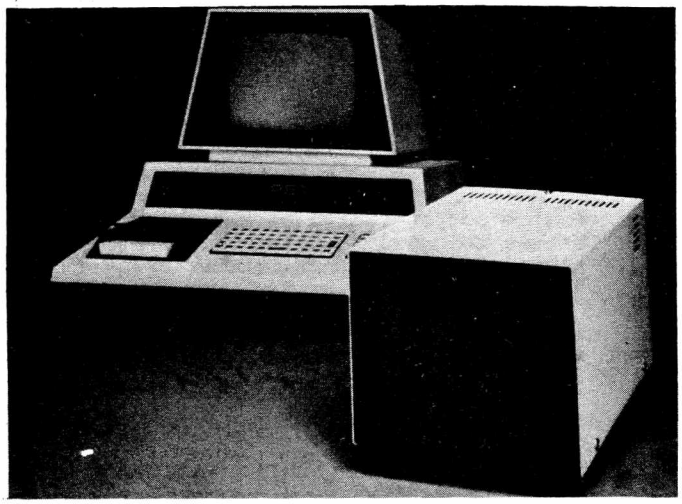
Numberama is based on the game of mastermind. The PET picks a random 4 digit number, none of the digits alike. It is your job to deduce what those 4 digits are and in what exact order. It uses GET commands which is good. After each 4 digit guess you make PET will tell you how many of your digits were the right digit and how many were in the correct position. Using these clues, you must try to discover the number in as FEW guesses as possible.

REVIEW
SWEE-PING @ $5.95
Micro Software Systems
PO Box 1442
Woodbridge, VA 22193

Swee-ping is a very simple game. It starts with the screen all white. Then a ball bounces around the screen. Every spot it crosses becomes black. You can change the balls direction using the keyboard. The program works beautifully, but I found it boring.

COMPUTHINK™

3260 ALPINE ROAD
MENLO PARK, CALIFORNIA 94025
(415) 854-2577



DISK DRIVER – COMMERCIAL GRADE DISK SYSTEM FOR THE PET* COMPUTER

- UP TO 800K BYTES ON LINE MASS STORAGE
- HIGH SPEED DISK OPERATING SYSTEM IN ROM
- EFFECTIVELY DOUBLES PET OPERATING SYSTEM COMMANDS
- EXTENSIVE SYSTEM AND APPLICATION SOFTWARE
- COMPLETE DOCUMENTATION ALLOWS USE OF FULL RESOURCES

DISKMON TECHNICAL SPECIFICATIONS

- HANDLES UP TO FOUR DISK DRIVES
- INCLUDES COMMERCIAL PRINTER SUPPORT
- ADDS 16 COMMANDS TO PET BASIC
- BUILT FOR COMMERCIAL SPEED REQUIREMENTS (Reads an entire track at a time)
- BUILT FOR COMMERCIAL RELIABILITY AND LONG DISK USE
  (Disks are automatically turned off between commands)
- DISKMON AUTOMATICALLY SELF-REORGANIZES FREE SPACE ON DISK AFTER EACH SAVE OR ERASE COMMAND. DISK FREE SPACE NEVER GETS FRAGMENTED

COMMAND SUMMARY

$LOAD	(Load program from disk)	$ODISK	(Open disk data file)
$SAVE	(Save program on disk)	$CDISK	(Close disk data file)
$ERASE	(Erase file off disk)	$RDISK	(Read disk data record)
$DIR	(Display contents of disk directory)	$WDISK	(Write disk data record)
$MEM	(Display memory)	$XEQ	(Load and run program overlay)
$GO	(Run machine language program)	$XER	(Load and run program share variables)
$HALT	(Reset machine language program pointers)	$PRNT	(Commercial printer support)
$FORMAT	(Format a blank diskette)	$BLIST	(List a basic program on printer)

DISK DRIVER comes with attractive cabinet, built-in power supply, disk controller, daughter board for the Expandamem* and necessary cables.

DKH642-1	Dual disk single head drive system (200K user data space)	$1295
DKH642-2	Dual disk double head drive system (400K user data space)	$1645
	DKH642-1 Available December – DKH642-2 Available March	

* The EXPANDAMEM (formerly Expandapet) Systems Board is the basic memory expansion board needed for the Disk Driver.

PET ASSEMBLER PROGRAMMERS GUIDE ASG200 $19.95

A complete guide to Assembler programming on the PET. Many pages of actual examples of how and where to tap into the rich world of PET assembler routines in ROM including all the floating point routines, how to intercept BASIC and add your own BASIC commands, how to run I/O from Assembler, and much much more. Comes in an attractively bound manual.

EXPANDAMEM SYSTEMS BOARD

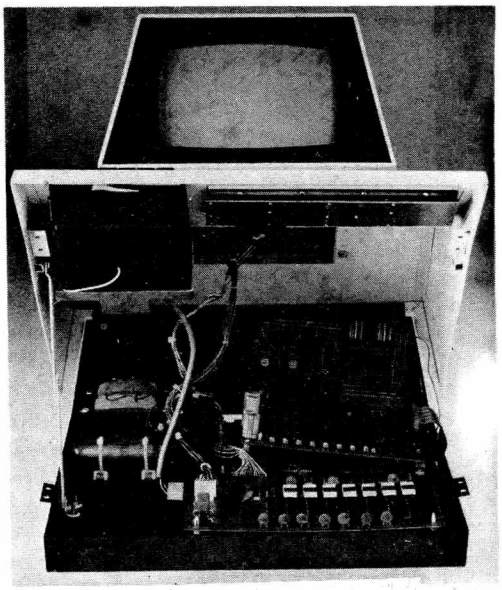
The EXPANDAMEM is a general-purpose expansion system for the Commodore PET and other 6502 Computer Systems (e.g. KIM, SYM and AIM). It consists of a printed circuit mother board with an array of dynamic memory chips and a controller for invisible refresh. The board also contains its own DC power supplies and buffers to drive several plug-in daughter boards. The daughter boards allow flexible addition of further system expansion.

16K EXPANDAMEM Systems Board ESB16K . . $425
24K EXPANDAMEM Systems Board ESB24K . . $525
32K EXPANDAMEM Systems Board ESB24K . . $615

**NOTE: The EPROM I/O Board is now listed separately from the ESB Main Board.*

PAYMENT TERMS
1. Individuals – 40% Deposit with remainder C.O.D. at time of shipment.
2. Established Dealers – C.O.D. at time of shipment.

NOTE: any order FULLY PREPAID at time of order will receive PREFERENTIAL SHIPMENT.



EXPANDAMEM (Formerly EXPANDAPET)

*PET is a trademark of Commodore International

PROFESSIONAL SOFTWARE PRODUCTS

DISKMON Disk operating system for the PET handles up to four minidisk drives, and adds 16 additional commands to BASIC including disk data files from BASIC. DISKMON includes a utility disk with several disk utility programs. DISKMON is sold only in ROM, as a part of the disk hardware. DKR011

DISKMON ASSEMBLER LISTING **DKL067** **$19.95**
A complete assembler listing (with all the original comments) of the entire DISKMON operating system. Comes in an attractively bound manual. (Available December 1978)

PET ASSEMBLER A true professional development tool for 6502 Assembler coding on the PET. This relocatable 6502 Assembler outputs a relocatable object file on disk or tape. All of the MOS Technology operand formats are permitted plus: expressions, load address commands, and much more. A true structured programming tool.
ASM789D (Disk, 16K PET) $49.95

AUTOLINK A true professional linking loader for creating machine language program files on disk or tape. Uses standard DISKMON object files as input, like those produced by the Assembler, Fortran compiler, or PLM compiler. AUTOLINK will link programs from different languages together to form a machine language program file on disk or tape.
LNK 456D (Disk, 16K PET) $49.95

ASSEMBLER-EDITOR A professional source program editor for PET Assembler programmers. Use the full screen of the PET to create and edit 6502 Assembler Source files. The Assembler-Editor outputs Assembler language source files on disk or tape which can be input to the PET-ASSEMBLER. Really makes Assembler programming fast!
EDT392D (Disk, 16K PET) $49.95

FORTRAN A professional Fortran compiler for the PET disk system. Inputs Fortran source files from disk and outputs relocatable object files on disk for use with the linking loader. This Fortran includes strings and many other additions.
(Available January 1979) $69.95

PLM A professional PLM compiler for the PET disk system. Inputs PLM source files from disk and outputs relocatable object files on disk for use with the linking loader. PLM is a machine independent language developed by INTEL.
(Available January 1979) $49.95

COMPU/THINK™ 3260 ALPINE ROAD, MENLO PARK, CALIFORNIA 94025 • (415) 854-2577

REVIEW
BETSI
$119/$165
Forethought Products
87070 Dukhobor Rd
Eugene, OR 97402

The BETSI is an S-100 adapter for the PET. We just got ours and only have been able to test it with a 24K memory board. It seems to be working fine. It will work with I/O boards too. It has 4 built in sockets for EPROMS. That is very useful. You can put your favorite routines or a small word processor program on EPROMs and BETSI will handle it for you. Part 2 of this review will be next issue. Till then, it looks very good.

REVIEW
PET DATA SHEETS
$2
Alcorn Data Services
PO Box 104
Corinth, Miss 38834

These data sheets come in pads of 50 for $2. They are 3 ring binder punched. The front side is a numbered 25 x 40 grid to aid in graphic layouts. The back side has all the CHR$ and POKE # info for every symbol as well as a place to keep track of variables and subroutines.

Great to help keep organized.

SUMMARY

Commodore is now mailing every PET owner who purchased their PET prior to a certain date a package containing a Manine Language Monitor on tape, 2 programs (Squiggle & Big Time), a booklet explaing them, and a booklet, PET COMMUNICATES WITH THE OUTSIDE WORLD. Thus you now have information you have been waiting for. We are presenting here a summary of the information we think is important. (Actually the whole book is important)

PARALLEL USER PORT

The User Port has 12 positions / 24 contacts. There are .156 inch spacing between centers of the contacts.

The contacts on the top are intended for use by a Service Technician. Use the top 12 connectors with EXTREME caution.

PIN 1 - Ground
PIN 2 - T.V.Video
PIN 3 - IEEE-SRQ
PIN 4 - IEEE-EOI
PIN 5 - Diagnostic Sense
PIN 6 - Tape#1 READ
PIN 7 - Tape#2 READ
PIN 8 - Tape WRITE
PIN 9 - T.V. Vertical
PIN 10- T.V. Horizontal
PIN 11- Ground
PIN 12- Ground
PIN A - Ground
PIN B - CA1
PIN C - PA0
PIN D - PA1
PIN E - PA2
PIN F - PA3
PIN H - PA4
PIN J - PA5
PIN K - PA6
PIN L - PA7
PIN M - CB2
PIN N - Ground

PA0 - PA7 are bi-directional I/O lines. CA1 is an input handshake line for those 8 lines. CB2 can act as the input or output of theVIAshift register as well as do most of the same things as CA1.

-CONTINUED-

-Continued-

SECOND CASSETTE INTERFACE

The second cassette interface has 6 connectors (12 contacts). Contact centers have .156 inch spacing between centers. Any connections to this port, other than the Commodore second cassette system are made at the users risk.

PINS A,1 - Ground
PINS B,2 - +5 volts
PINS C,3 - Motor
PINS D,4 - Read from cassette
PINS E,5 - Write to cassette
PINS F,6 - Sense if PLAY, REW, or FFWD pressed

MEMORY EXPANSION CONNECTOR

Spacing between the 40 positions (80 contacts) are .1 inch. All upper 40 contacts are ground returns for the corresponding lower contacts.

PIN 1 - BA0 - Address bit 0
PIN 2 - BA1 - Address bit 1
PIN 3 - BA2 - Address bit 2
PIN 4 - BA3 - Address bit 3
PIN 5 - BA4 - Address bit 4
PIN 6 - BA5 - Address bit 5
PIN 7 - BA6 - Address bit 6
PIN 8 - BA7 - Address bit 7
PIN 9 - BA8 - Address bit 8
PIN 10- BA9 - Address bit 9
PIN 11- BA10 - Adress bit 10
PIN 12- BA11 - Address bit 11
PIN 13- No connection
PIN 14- No connection
PIN 15- No connection
PIN 16- SEL 1 - locations 1000-1FFF
PIN 17- SEL 2 - locations 2000-2FFF
PIN 18- SEL 3 - locations 3000-3FFF
PIN 19- SEL 4 - locations 4000-4FFF
PIN 20- SEL 5 - locations 5000-5FFF
PIN 21- SEL 6 - locations 6000-6FFF
PIN 22- SEL 7 - locations 7000-7FFF
PIN 23- SEL 9 - locations 9000-9FFF
PIN 24- SEL A - locations A000-AFFF
PIN 25- SEL B - locations B000-BFFF
PIN 26- No connection
PIN 27- RES - reset
PIN 28- IRQ - interrupt request
PIN 29- B02 - Buffered phase 2 clock
PIN 30- R/W - Buffered Read/Write from 6502
PIN 31- No connection
PIN 32- No connection
PIN 33- BD0 - Data bit 0
PIN 34- BD1 - Data bit 1
PIN 35- BD2 - Data bit 2
PIN 36- BD3 - Data bit 3
PIN 37- BD4 - Data bit 4
PIN 38- BD5 - Data bit 5
PIN 39- BD6 - Data bit 6
PIN 40- BD7 - Data bit 7

All Data and address bits are fully buffered. Address 8000-8FFF seems to be missing.

IEEE BUS LIMITATIONS

Three physical limitations should be noted when connecting devices to the IEEE bus.

* 20 meters is the maximum bus extension
* Up to 15 devices can be connected
* Spacing between devices can be up to 5 meters

-CONTINUED-

-Continued-

INPUT/OUTPUT COMMANDS

```
OPEN    - Open a logical file
CLOSE   - Close a logical file
PRINT#  - Write data from PET to I/O device
CMD     - Write data from PET to I/O device
          Leaves device an active listener
          Must close with a PRINT#
INPUT#  - Read data from I/O device to PET
GET#    - PET accepts one character
          from I/O device
```

There are four parameters to consider.
* Logical file number (LF)
* Device number (D)
* Secondary address (SA)
* File name (FN)

EXAMPLE:

```
  OPEN LF,D,SA,FN
```

or

```
  OPEN 1,5,2,"EXAMPLE"
```

DEFAULT PARAMETERS

If you do not specify each of the four parameters listed above, the PET assigns default values.

DEFAULT VALUES

DEVICE NUMBER (D) - 1 (cassette #1)
SECONDARY ADDRESS (SA) - 0 (read or none)

EXAMPLES:
OPEN 1 - means OPEN 1,1,0
OPEN 1,2 - means OPEN 1,2,0

LOGICAL FILES

To store and retrieve data you can use logical files. The greatest number of files the PET can control at one time is 10. Exceding 10 files will result in loss of your PET. It must be turned off and back on again. A logical file number may be any integer from 1 through 255.

DEVICE NUMBERS

Device number 0 is Keyboard
1 is Cassette 1
2 is Cassette 2
3 is Video Screen

All other devices are assumed to be IEEE devices. Most IEEE devices allow you to choose the device number by means of a switch or the connection of jumpers.

SECONDARY ADDRESS

The secondary address allows several modes of operation to each device. The secondary address can be any integer from 0 to 31.
EXAMPLE:

PET cassette units 1 and 2 use the following set of secondary address rules.

0 - Tape OPENed for -read-
1 - Tape OPENed for -write-
2 - Tape OPENed for -write-
An -End Of Tape- (EOT) marker will be forced when the file is closed.

-CONTINUED-

-Continued-

FILE NAMES

A file name on Cassette 1 and 2 can be up to 128 characters long. When a file is searched for, characters are matched in ascending order. Although the PET will only print the first 16 characters of a file name, it matches as many as you ask it to up to 128.

CASSETTE OPERATION

PET has control over the motor movement of the cassette units. One switch is also used to sense if either PLAY, FFWD, or REW are depressed. It cannot distinguish between those three buttons.

RECORDING TECHNIQUE

PET records data at two audio frequencies in two consecutive blocks. A single tone is written between each data block to synchronize speed and position. Also by writing about 10 seconds of leader before opening a file, the PET allows for normal tape leader.

TAPE BUFFERS

Both cassette 1 and 2 have a 192 character buffer. Cassette 1 begins at decimal address 634 followed by cassette 2 beginning at decimal address 826.

When reading from or writing to tape the data is stored in the tape buffer until 192 characters are accumulated. If reading, the next block of 192 is read in. When writing, the contents are then written on tape. Thus all data blocks (and file headers) are 192 characters long.

The program files are written directly onto tape from memory as two consecutive redundant blocks. Since program memory locations are variable, beginning and ending addresses are included in the file header.

I/O OPERATIONS

There are 3 main steps when dealing with I/O and files.
* OPEN the file
* Read/Write data to/from the file
* CLOSE each file before ending

OPENING FILES

As mentioned earlier under Input/Output Commands you OPEN a file using the following format:

```
OPEN LF,D,SA,FN
```

Your command is OPEN. You specify which logical file, the device number you are assigning this file to, the secondary address if necessary, and the file name (if any). Since this data is interpreted by BASIC you may use computed numbers for the logical file, device, and secondary address.

N-O-T-E: The PET has a problem with OPEN for data files on tape. The file is automatically opened, but the file header may not be written at the beginning (the operating system does NOT always correctly initialize the buffer pointer).

-CONTINUED-

-Continued-

PRIOR to each OPEN include the following fix:

```
Cassette 1:  POKE 243,122
             POKE 244,2

Cassette 2:  POKE 243,58
             POKE 244,3
```

If a tape file is opened directly via the keyboard, then the appropriate prompting messages are displayed (PRESS PLAY ON TAPE 1, SEARCHING FOR FILE NAME, etc). However if tape files are opened under program control, NO messages are displayed on the screen. The current programs video display thus is not disturbed.

If the command LOAD is executed under program control variables are not initialized and remain unchanged (the second program must NOT be longer than the program which executed the LOAD).

TAPE INPUT

For each file OPENed for read on a cassette unit each character requested from BASIC is fetched from the tape buffer. Whenever the buffer is empty, the program is suspended while the next data block is read in from tape. If an error occurs it is noted in the STATUS WORD. A good programming technique would be to check the STATUS WORD (ST) after every input from tape. (See the section on Error Detection)

INPUT#

One command you can use to transfer data from an I/O device to the PET operating system is INPUT#. Format for it is:

```
INPUT# LF,A  - LF is logical file number
               A is the variable
or
INPUT# LF,A$ - LF is logical file number
               A$ is the string variable
```

You may have several variables after one INPUT# command. Example:

```
INPUT# LF,A,A$,B$,DC$,X

LF is logical file number
following it are input variables
separated by commas
```

EXAMPLE of a short routine to read 50 numbers from cassette 1 from the file called EXAMPLE.

```
10 OPEN 5,1,0,"EXAMPLE"
20 FOR L=1 TO 50
30 INPUT#5,A
40 PRINT A : REM print the number
50 NEXT L
60 CLOSE 5
```

GET#

GET# will fetch one character and put it in the specified field. It's format is:

```
GET# LF,Field
```

INPUT BUFFER

All data input to the PET (via INPUT# and GET#) is received one character at a time. In order to edit it, BASIC accumulates the characters in an 80 character input buffer. This buffer MUST be terminated by a carriage return. If more than 80 characters are read without encountering a carriage return the operating system variables are overwritten causing the PET operating system to malfunction. The PET must be turned off and back on again to function properly again. If the I/O device sends more than 80 characters, you can use the GET command and build you own strings inserting the necessary carriage returns.

-CONTINUED-

-Continued-

ERROR DETECTION

The PET uses a "Status Word" to aid in I/O error detection. You may call it any time during your program. The status word is stored as ST.

The cassette units only check data on a read. Errors that are detected:

* SHORT BLOCK - ST=4 bit 2
  spacer tone encountered before expected
  possibly a short program file
  instead of a data file

* LONG BLOCK - ST=8 bit 3
  spacer tone was not encountered as expected
  possibly a long program file
  instead of a data file

* UNRECOVERABLE READ ERROR - ST=16 bit 4
  more than 31 errors on the first block
  of redundant blocks
  or an error in the same place in both blocks

* CHECKSUM ERROR - ST=32 bit 5
  checksums did not match

* END OF FILE - ST=64 bit 6
  End Of File mark was encountered

* END OF TAPE - ST=-128 bit 7
  End Of Tape mark was encountered

When doing a verify the status words are:

* SHORT BLOCK - ST=4 bit 2
* LONG BLOCK - ST=8 bit 3
* ANY MISMATCHES - ST=16 bit 4
* CHECKSUM ERROR - ST=32 bit 5

EXAMPLES:

```
100 INPUT#2,X,Y,Z
110 IF ST=0 THEN GOTO 200:REM process normally
120 IF ST=64 THEN GOTO 300:REM end of data
130 IF ST AND mask THEN instructions
mask=the bit being tested
```

DATA OUTPUT

For output from the PET to a device you may use the command PRINT#. The format to use is:

```
PRINT# LF,A$
       LF is the logical file
       A$ is the string variable
or
PRINT# LF,A
       LF is the logical file
       A is the numerical variable
```

You may have several variables after one PRINT# command. Example: PRINT# LF,A,A$,C$

The above example may not do exactly what you think. Data is transferred one character at a time to the device. Many file deliniters such as commas are automatically eliminated by BASIC. This doesn't affect the printing. However, remember when reading the data back, file deliniters must be forced. This forcing of deliminaters may be accomplished by inserting a CHR$(44), a comma, between fields. Thus

```
PRINT# LF,A,A$,C$
```

would be sent as:

```
AA$C$
```

-CONTINUED-

-Continued-

To correct for this you should make your statement similar to:

```
PRINT# LF,A;CHR$(44);A$;CHR$(44);C$
```

or

```
PRINT# LF,A;",";A$;",";C$
```

Each of these will send:

```
A,A$,C$
```

followed with a carriage return

Or you could have a separate PRINT# for each variable sent:

```
PRINT#LF,A
PRINT#LF,A$
PRINT#LF,C$
```

This will be sent as (cr=carriage return):

A cr A$ cr C$ cr

N-O-T-E: PRINT may be abbreviated as "?" but PRINT# cannot be abbreviated as "?#". PRINT# can be abbreviated as "Pr" (P shift R).

N-O-T-E: Some PETs do not automatically turn the cassette motor on before starting to write the data. Thus it is best to have your program monitor the buffer. Just before the 192nd character is transferred into the buffer turn on the cassette motor for .1 seconds. The simplest way to do this is to

```
POKE 59411,53   for cassette 1
```

or

```
POKE 59456,207  for cassette 2
```

after EVERY PRINT# statement. This keeps the motor on all of the time. However, you should not run the cassette motor for extended periods of time. You should then POKE the motor on and have a .1 second delay loop just prior to each PRINT# statement.

CMD COMMAND

The CMD and PRINT# commands are very similar. Basically, each assigns a device as a listener, and sends the data. When the PRINT# is finished, the device is "unlistened". The CMD leaves the device as a listener. Thus to get out of a CMD command you must issue a PRINT# for that logical file. Until then BASIC treats the last CMD device as the primary output device (rather than the video screen).

EXAMPLES:

```
OPEN 3,5   where device 5 is your printer
CMD 3
LIST       lists onto the printer
```

Then to print and write to disc at the same time:

```
CMD 3
PRINT#15,X,Y,Z
```

The above has logical file 3 previously opened to your printer and logical file 15 previously opened to your floppy disc. Now to monitor an input device:

```
CMD 3
INPUT#15,X,Y,Z
```

The above again assumes your printer has been opened with logical file 3 and you are reading from your floppy which was opened previously.

CLOSING FILES

Once you OPEN a file you should close it when you are finished using it. If it is a tape or disc file you MUST close it before the program ends. If it is not closed no "End Of File" mark will be recorded. Thus when the tape is loaded into memory your PET won't know when it reaches the end of file. To close a file:

```
CLOSE LF     LF is the logical file
```

To close logical file 3: `CLOSE 3`

REVIEW- LEM LANDING FROM MOON ORBIT- $9.95- Alpa Omega Software, 1015 Saturn Springs Dr, Garland, TX 75041

The cassette has the instructions on one side and the game on the other side.

The instructions are very detailed, typed in lower case, and tell us what, why, where, but not how! PET graphics have been well used - sections of the program are pointed out for those intereste in how the program functions. NO instructions were given as to how to input three variables

T - time of engine burn
P - percentage of thrust
A - angle of thrust

Thanks to Len (the editor) I found it necessary to input each variable followed by a comma. It would be helpful to include in the instructions "HOW" to input (T):(P) and (A).

The game uses graphics and animation very effectively to "reward" you for YOUR choice of engine burn, thrust and angle. The program author suggests about 45 minutes to succesfully land the LEM on the moon. The program is well done and really requires thought. Since the instructions are on the same tape as the game they cannot become separated or lost.

REVIEW BY J H KINAST

REVIEW- PET TUTOR- $39.95- The *PET* Paper, PO Box 43, Audubon, PA 19407

This is a package to teach a beginner PET BASIC. It comes separately as 2 tapes containing a total of 20 lessons, ready to load ($19.95) and a manual that is the same text and examples as on the tapes only in printed form ($29.95). Both the tapes and the manual come together as a package for $39.95.

The PET Tutor explains PET BASIC right from the bottom up (similar to self teaching guides to BASIC on the market, but this one specializes in PET BASIC). There are some very good tips inside as well as some short programs as examples. This is NOT a manual for the PET itself but rather a guide to PET BASIC. If you are low on money get just the tapes. Then you won't have the manual for quick reference, but you aren't missing any information since the manual is merely reproductions of what the tapes display on the screen.

This is a good way for beginners to learn BASIC.

REVIEW- DICTATOR- $7.95- Dr. Daley, 425 Grove Ave, Berrien Springs, MI 49103

This simulation is similar to King and Hammurabi. You are the ruler of a country. You must decide how much to feed/pay your people, how much to plant, how much land to sell, and how much to spend on education and anti-air pollution. The unit of "money" is not the dollar yet their are no guidelines as to the worth of the fictious unit. There are realy no instructions so to speak. You are left confused with questions such as: How much do you want to pay your comrades? There are no guidelines given as to how much 1 comrade needs to survive. Several other variables enter in which unexplained seem confusing. Besides this, supposedly normal transactions had strange results for me. Example: I start with 2000 sq. miles of land. I sell 500 to get some money. Then I am told that I only have 500 left. What kind of math is that?

This is a simulation and simulations are my favorites. But I kept losing after 1 or 2 turns (due to lack of info to make my decisions) so I was frustrated. GET commands are NOT used. You must type the whole word Y-E-S [RETURN] to answer some questions (just a Y will not suffice).

June 16, 1978

The PET GAZETTE
1929 Northport Dr.,Rm. 6
Madison, WI 53704

COMPUTERS ONE
SUITE 306 - KAHALA OFFICE TOWER
4211 WAIALAE AVE.
HONOLULU, HAWAII 96816

Attention: Mr. Len Lindsay, Editor

Dear Mr. Lindsay:

Thank you for sending us a copy of your June PET GAZETTE. Our "HUSTLERS" ad turned out very well thanks to your quality printing and paper stock.

Your "REVIEW" was factual and to the point. I might point out that our use of DATA lines "in residence" was a thought-out, deliberate decision. As you now know, all the present "HUSTLERS" are "sorting" programs that take random made entries,sorts them into the various coded catagories, and prints the account totals. The catagories or accounts can quickly and easily be recalled by the operator.

To use a DATA entry tape separate from the program tape would require a tape "pass" for each catagory request, or a massive machine memory storage(like the large computers) to gather up and store each item of each catagory as the tape passed thru the "read" cycle, so each catagory could be called up and displayed on request. Would either of these be practical for personal type computers?

Another way to use a DATA tape would be the use of a "read" subroutine that would dump all DATA entries into machine memory, then "read" them as we do with our DATA line read. This method would still limit DATA lines accomodated to machine memory capacity, but make for more complicated operating procedures (loading two tapes,ect.)

So, on reflection it was our opinion that for THIS type of sorting program, the most simple DATA storage method to use was the "in residence" DATA lines. There are several valid, in our opinion, operating advantages to be gained. Obviously, for many programs handling great amounts of information, the separate DATA tape or tapes is the way to go.

Could using DATA files improve our programs, in your opinion? I would appreciate your detailed comments on this matter, because I most certainly do not claim to know all there is to know about programming and computers in general!

You might be interested to learn that adaptations of our programs to operate the PET printer (and the TRS-80 line printer also) are in the finishing stages, and should be available to the market within several weeks.

Thanks again for your interest, I will answer any inquiries promptly.

Aloha,
K.W. Harris

REVIEW
SOME COMMON BASIC PROGRAMS
$10 tape/$8.50 book
Osborne & Associates
630 Bancroft Way
Berkeley, CA 94702

Here is something to consider. For $10 you get 74 ready to load and go programs. These are the same programs from their book by the same title. The book is $8.50, and has all the program listings and sample runs as well as suggestions for modification. By getting the tape you don't have to type them in and figure out the mods needed for the PET display. The programs include: Day of the week, Alphabetize, Chi-square, Loans, Mortgage, Investments, Recipe cost, Taxes, Check Writer, and many more. The tape we received to review loaded and ran the first try. For about 15 cents per program you should do quite well.

******* PET CLUBS *******

B.C.-Society of PET Owners and Trainers -Victoria, 947 Russell St
B.C.-Vancouver PET User Group Box 35353, Station E

CA-PUG (South Bay) meets every 1st WED
CA-SPHINX (East Bay) meets every 2nd & 4th Thurs. (415) 451-6364
CA-BAMUG call for info (415) 523-7396
CA- North Orange County Computer Club, Dave Smith, 3030 Topaz #A, Fullerton,CA
CA-Sacramento PET Workshop meets every 3rd Thurs at 7:30 (916) 445-7926
CA-Valley Computer Club meets at 2006 Magnolia Blvd, Burbank every 1st Weds at 6 pm CALL 213- 849- 4094

ENGLAND-PET Users Group, Tom Turnbull, 49x9th Row, Ashington, Northumberland

IN-Indianapolis PET users may contact Jerry Brinson at (317) 898-3604

Japan-PET User Group Shinsen Park Himu Room 201, 4-13 Shinsencho Shibuya-ku, Tokyo

MN-Twin Cities contact John Fung (612) 376-5465

MO-St Louis contact Ginny Perkinson, 46 Westwood Ct

NJ-PET users meet every 4th Fri at 7pm. (201) 233-7068

NY-Westchester PET User Group meets every 2nd Tues CALL 914- 428- 7872
NY-White Plains contact Computer Corner

TN-River City Computer Hobbiests meet every 1st Mon at the main library

TX-contact John Bowen of Texas A&M Microcomputer Club

VA- PET users may contact Bob Karpen in Reston at (703) 860-9116

WI-Madison area meets every 1st Thurs 7pm at 1400 E Washington Ave, Rm 150.

REVIEW - SCHEDULE PLANNER - Sawyer Software - $15

This program has a lot of features but is difficult to use. In fact, I gave up in frustration after only a few sessions with it. The program is intended to allow one to keep a computerized combination of an appointment book and a "to do" list. One may create, alter, manipulate and save on tape a file of appointments or activities. For each activity the file contains a date-time, a priority and a description.
This sounds good. Unfortunately, the program has bugs and seems designed to discourage use. For example, for each activity one must press 13 keys to enter the date-time: 3 letters for the month and 2 digits each for the day, year, hour, minute and seconds. Yes, seconds are required. A more serious problem is the remove command. To remove a finished activity from the file one must retype the entire entry letter for letter. This can be a lot of unnecessary, boring work. And if one makes a mistake the program does not inform him. Instead it effectively removes the last entry in the file, which is rarely the correct one.

The program has many other features and many other problems. It comes with 3 pages of instructions which are well written but inadequate to describe all the eccentricities of the program.

--Pete Weiler--

REVIEW-PRACTICAL COMPUTING magazine-12 pounds per year to US.

PET seems to be a popular topic in this English magazine. PET program listings are included as well as lists of PET dealers and other PET information. Of course other computers are included also. There are many ads for PET products. A good looking magazine.

Dear Editor:

From the Pet owners I have talked to so far I seem to be hearing the same thing; that the Commodore is really not totally supporting their product. I have personally ordered two tapes directly from Commodore and to date have not received either one of them. I have called Commodore for the past three months and have heard the same answer, "We are just about ready to publish them, they are on their way in a few days". I feel that if it wasn't for people like yourself, Commodore would be going out of business. They still just might if they keep up the poor support provided over the last year. As you know a product is only as good as the support it gets from its manufacturer, and Commodore is not providing much support these days. The problem I am most concerned about is that until I purchased my machine I really did not know too much about computers or programming. I believe my progress has been hendered because of the poor support in the way of manuals needed to really operate such a machine. Until I received your paper I was at the point of selling or trading my machine for an Apple II. I feel Commodore is not going to support this product as would a totally dedicated computer house. I realize that software is always a bit behind the hardware however, I deal with contractors on a daily basis who wouldn't stay in business very long if they gave such poor software support. To their customers they may manufacture a great machine for the money but without software they will not survive in such a competitive market.

I would like to add that your Gazette is one super document. Keep up the good work.

REVIEW
COMMODORE
PET USER CLUB
NEWSLETTER
10 pounds
Commodore Systems
360 Euston Road
London NW1 3BL
** ENGLAND **

Yes, it's true. Commodore in England actually gives out information. They even have a newsletter, an excellent one to boot. It is now probably on its 6th issue. Long ago they printed a memory map of the PET and told how PET stores a BASIC program. Issue 3 told how to link programs via overlays. A condensed version is printed in this issue. From it you can tell that they have an excellent, informative newsletter. We are checking on how Americans can get it. Write to them and inquire. It probably will cost extra for the airmail postage. In one word.- FANTASTIC !! - ADD 5 pounds airmail.

It looks like the PET Printer will start being shipped in March 79. It has been totally redesigned and looks different now. If you need a printer, you can either get an RS-232 adapter to use any RS-232 printer OR you can use the Parallel User Port to hook up a printer in parallel. (SWTP printer now has a PET connector as an option)

Permission is granted to photocopy this newsletter in part or in whole for any non commercial use. Reprints in other non profit publications are fine if they acknowledge the PET GAZETTE and list our address.

NOTE: WE will NOT copy any software that is copyrighted. Please tell us if we unknowingly have copyrighted material in our cassette exchange and it will be removed.

Did you notice the widely distributed Commodore announcement of the PET Printer had the image of the printer reversed. It appeared that the printer was printing from right to left with most of the text on the right side, flush right. Have no fears, the printer does not print right to left. It's output will be just like this page, print starting from the left margin.

PET

NOTICE

SORRY BUT OUR LIST OF
SOFTWARE AND HARDWARE SOURCES IS BEING LEFT OUT.
NEXT ISSUE HOPEFULLY WILL HAVE AN UP TO DATE LIST.

REVIEW-MAXIT-$4.95-H. SAAL

Here is an EXCELLENT number strategy game. You can play with another person or challenge the PET -- but you will be surprised how good the PET can play. The object is to get the highest score. Each player alternates moves, picking a number and adding up the points. The hitch is that a marker is placed on top of the last square chosen on this grid of numbers. One player only can chose a square not yet taken in the same ROW as the marker for that turn, the other player can only choose a square in the same column as the marker. Ther results are very interesting, especially at the end. A good game for thinkers.

REVIEW-PETSHACK PROGRAMS-
MONITOR & 6502 DISSASSEMBLER & PEEK

Unfortunately our review on these two programs is late . Please note that the programs do exist and will be reviewed next issue.

REVIEW
MACHINE LANGUAGE MONITOR
$12
SMITH BUSINESS SERVICES
PO BOX 1125
Reseda, CA 91335

The review for this monitor is late. Thus you will have to wait till next issue for it.

Here is a program NO-NO:

```
100  IF E=F OR E=G THEN.....
```

With this you will get "SYNTAX ERROR" because PET picks it up this way:

IF E=FOR....

Should you be faced with this situation simply reverse as follows:

```
100   IF E=G OR E =F   THEN......
```

PROGRAM OVERLAYS

Mike Stone

Condensed from his article in:

Commodore PET Users' Club Newsletter
Issue 3
Commodore Systems
360 Euston Road
London NW1 ENGLAND

Some background info:

*** PET stores BASIC programs in location 1024 upwards.**

*** Along with each BASIC statement PET stores a forward chain address. This tells PET where the next highest line number is.**

*** The forward chain address and BASIC line numbers are stored in TWO consequtive memory locations as low byte then high byte. Multiply the high byte times 256 and add it to the low byte to come up with the decimal line number.**

*** When a new line is added to BASIC PET moves every statement around as necessary and readjusts the forward chaining. Thus BASIC programs are always stored by increasing line numbers.**

*** When a LOAD is executed under program control and the new program is not longer than the previous one variables are not changed.**

*** Any statements in the previous program not overwritten by the new program remain unchanged in PETs memory. PET just doesn't realize they are there.**

If we code instructions we do not want overwritten with high line numbers - and if the new program segment does not overwrite them - and if we can force the new segment to chain into them - THEN we have a real overlay system.

SO - Find in PETs memory the last statement you do not want preserved. Included with it is the forward chain information pointing to the next statement. That next statement is one you DO want preserved. Now, when your new program segment is loaded in (not overwriting the instructions you were preserving) you must find its last statement. Now you simply replace its forward chain with the chain you previously found from the old program. Now the two segments are joined.

An Illustration of this:

Enter the following program. DO NOT use any spaces except 1 after the line number.

```
10 A=A+1
20 GOSUB50
30 LOAD"NEWPROG"
50 PRINTA*2
55 RETURN
```

-CONTINUED-

-Continued-

ADDRESS	VALUE	MEANING
1024	0	delimiter
*1025	11	forward chain low byte=11
1026	4	plus high byte of 4 x 256=chain to 1035
1027	10	line number low byte=10
1028	0	plus high byte of 0 x 256=line 10
1029	65	A
1030	178	=
1031	65	A
1032	170	+
1033	49	1
1034	0	delimiter
*1035	19	forward chain low byte=19
1036	4	plus high byte of 4 x 256=chain to 1043
1037	20	line number low byte=20
1038	0	plus high byte of 0 x 256=line 20
1039	141	GOSUB
1040	53	5
1041	48	0
1042	0	delimiter
*1043	34	forward chain low byte=34
1044	4	plus high byte of 4 x 256=chain to 1058
1045	30	line number low byte=30
1046	0	plus high byte of 0 x 256=line 30
1047	147	LOAD
1048	34	"
1049	78	N
1050	69	E
1051	87	W
1052	80	P
1053	82	R
1054	79	O
1055	71	G
1056	34	"
1057	0	delimiter
*1058	43	forward chain low byte=43
1059	4	plus high byte of 4 x 256=chain to 1067
1060	50	line number low byte =50
1061	0	plus high byte of 0 x 256=line 50
1062	153	PRINT
1063	65	A
1064	172	*
1065	50	2
1066	0	delimiter
*1067	49	forward chain low byte=49
1068	4	plus high byte of 4 x 256=chain to 1073
1069	55	line number low byte=55
1070	0	plus high byte of 0 x 256=line 55
1071	142	RETURN
1072	0	delimiter
*1073	0	no forward address exists

-CONTINUED-

-Continued-

We wish to use lines 50 and 55 with our new program, thus we made sure our new program was short enough and did not overlay them. Next we need to know where line 50 begins so that we can create a forward chain to it. N-O-T-E--- We do not wish to forward chain to the address storing line 50 (address 1060) BUT rather to the forward chain just preceding it (address 1058).

Next we must have the highest line number in the new program forward chain to line 50 (address 1058, remember?)

Let's see how it works!! Save the first program on tape, call it "PROG". Imediately after it on that tape save the following program, call it "NEWPROG". Before entering this program remember to clear out the previous one by typing NEW.

```
 5 A=A*2
10 GOSUB50
15 STOP
```

List it to make sure there are NO extra spaces and that lines 50 and 55 are gone.

You now have a tape with "PROG" immediately followed by "NEWPROG". Rewind your tape and hit shift RUN. PROG will be loaded, run, and will print a "2". Then it will load in NEWPROG. When that has been loaded PET will tell you

```
?UNDEF'D STATEMENT ERROR IN 10
```

That is because now the program is:

```
ADDRESS VALUE  MEANING

 1024     0  delimiter

*1025    11  forward chain low byte=11
 1026     4  plus high byte of 4 x 257=chain to 1035

 1027     5  line number low byte=5
 1028     0  plus high byte of 0 x 256=line 5

 1029    65  A
 1030   178  =
 1031    65  A
 1032   170  *
 1033    50  2
 1034     0  delimiter

*1035    19  forward chain low byte=19
 1036     4  plus high byte of 4 x 276=chain to 1043

 1037    10  line number low byte=10
 1038     0  plus high byte of 0 x 256=line 10

 1039   141  GOSUB
 1040    53  5
 1041    48  0
 1042     0  delimiter

*1043    25  forward chain low byte=25
 1044     4  plus high byte of 5 x 256=chain to 1049

 1045    15  line number low byte=15
 1046     0  plus high byte of 0 x 256=line 15
 1047   144  STOP
 1048     0  delimiter

*1049     0  No forward chain exists
```

-CONTINUED-

-Continued-

N-O-T-I-C-E!! The last line (line 15) does not chain into our old line 50. BUT line 50 is still there, beginning in location 1058. NOW DO THIS:

```
POKE 1043,34
POKE 1044,4
```

NOW LIST and there are lines 50 and 55. It worked. RUN it to prove it.

You can program all this to happen automatically. First assume that the lines to be preserved in the first program start at line 5000. So, just before that add these 3 lines. (Remember, NO spaces)

```
4997 N1=PEEK(201)
4998 N2=PEEK(202)
4999 RETURN
5000 your first line to be preserved
```

Locations 201 and 202 always contain the address of the next instruction (during program execution). Actually the location of the "0" between instructions.

NOW, just prior to your statement in your first program LOAD "NEWPROG" add the following lines. (You can use spaces now if you wish)

```
850 GOSUB 4997
860 N1=N1+14:REM low address of 4999
                4998 is 14 bytes long
870 N2=N2*256:REM actual high address of 4999
880 IF N1<256THEN900:REM adjust low byte
                        for page boundary
890 N1=N1-256
900 BC=N1+N2+1:REM BC is now actual machine
                  address of line 4999
910 Z1=PEEK(BC):Z2=PEEK(BC+1)
915 REM hold the forward chain locations
      out of 4999
920 LOAD "NEWPROG"
```

Chain adjusting must be done in the first and last statements of NEWPROG. At the END of NEWPROG these should be the VERY LAST statements (NO spaces):

```
3997 N1=PEEK(201)
3998 N2=PEEK(202)
3999 RETURN
```

The first lines should be:

```
10 GOSUB3997
20 N1=N1+14
30 N2=N2*256
40 IF N1<256 THEN 60
50 N1=N1-256
60 BC=N1+N2+1:REM BC is now the actual
                 machine address of 3999
70 POKE BC,Z1:POKE BC+1,Z2
```

FINISHED.

The ideas in this article could lead to several more articles. Please send us your findings.

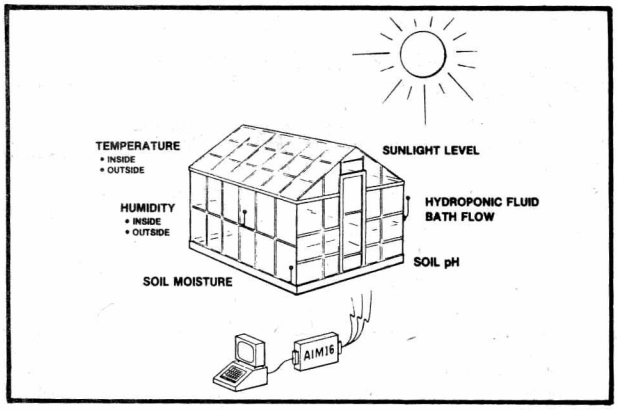
DAM YOUR PET
DAM YOUR TRS-80
DAM YOUR KIM
DAM YOUR . . .

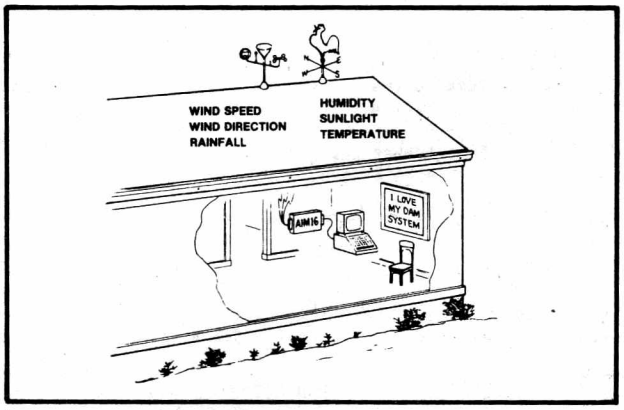
MEASURE - RECORD - CONTROL

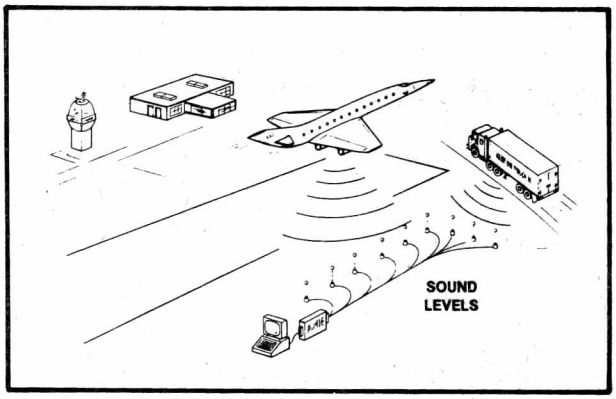
- TEMPERATURE
- DIRECTION
- PRESSURE
- LIGHT LEVELS
- db
- POLLUTION CONTROLS
- DARKROOMS
- HUMIDITY
- LIGHT
- ENERGY CONSERVATION EQUIPMENT
- GREENHOUSES
- SPEED
- WEATHER STATIONS
- NOISE POLLUTION
- pH
- EARTHQUAKE TREMORS
- VELOCITY
- ACCELERATION

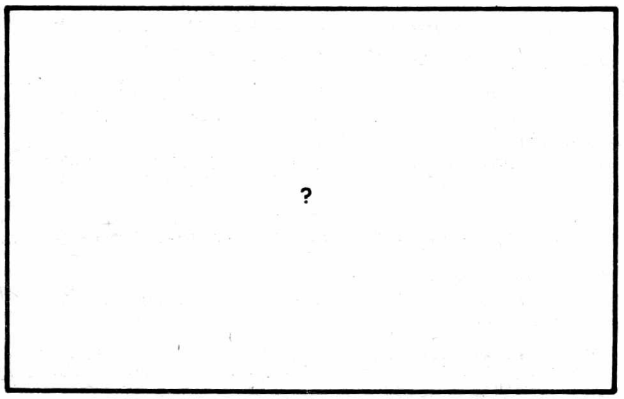
DATA
ACQUISITION
MODULES by CMC

NOW YOUR COMPUTER CAN LISTEN TO THE REAL WORLD. YOU GET 16 8 BIT ANALOG INPUTS WITH OUR AIM16.









CMC CONNECTICUT microCOMPUTER
150 POCONO ROAD - BROOKFIELD, CONNECTICUT 06804
(203) 775-9659

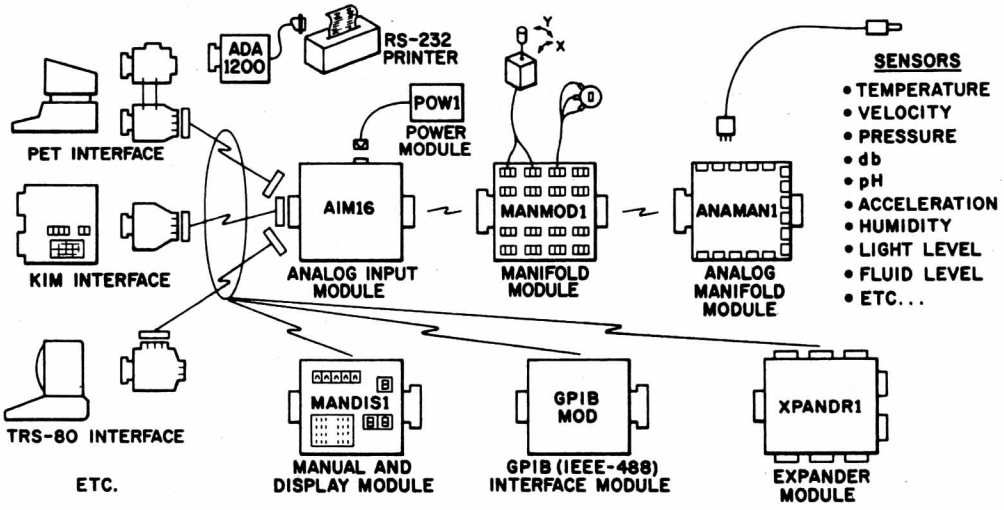
DAM SYSTEMS

CONNECTICUT microCOMPUTER

150 POCONO ROAD - BROOKFIELD, CONNECTICUT 06804

(203) 775-9659

DAM SYSTEMS



DAM SYSTEMS by CmC
A complete system of modules to let your computer listen
to the real world.

DAM SYSTEMS PRICE LIST

AIM161 - Analog Input Module
16 8-bit analog inputs - 100 microsecond conversion time - 3 state output - requires one 8-bit computer output port for control and one 8-bit computer input port for data — $159.00

AIM162 - Analog Input Module
As above plus: greater accuracy - gold plated contacts - pilot light - switch selectable start, enable and ready polarities. — $229.00

POW1 - Power Module
Supplies power for one AIM16 module. — $14.95

ICON - Input Connector
20 pin card edge connector - solder eyelets — $9.95

OCON - Output Connector
For connecting the AIM16 to a computer - 18 pin card edge connector - solder eyelets — $9.95

AIM161 Starter Set
Includes one AIM161, one POW1, one ICON and one OCON. — $189.00

AIM162 Starter Set
Includes one AIM162, one POW1, one ICON and one OCON. — $259.00

MANMOD1 - Manifold Module
Use in place of ICON. 16 3-screw terminal barrier strips for connecting joysticks, potentiometers, voltage sources, etc. Eliminates the need for soldering. Plugs into the AIM16. — TBA

ANAMAN1 - Analog Manifold Module
Use in place of ICON. Connects DAM SYSTEMS SENSORS to the AIM16 without soldering - sensor cables just plug in. Plugs into the AIM16 or the MANMOD1. — TBA

SENSORS
Sensors for temperature, pressure, flow, humidity, level, pH, motion, etc. — TBA

COMPUTER INTERFACES
For the PET, KIM, TRS-80, etc. Use in place of OCON. Eliminates the need for soldering or special construction. — TBA

MANDIS1 - Manual and Display Module
Connects between the AIM16 and the computer interface. Allows manual or computer control of the AIM16. Displays channel number and data. — TBA

GPIB MOD - GPIB (IEEE-488) Interface Module
Allows the DAM SYSTEMS MODULES to be used with the GPIB bus instead of a computer's other I/O ports. — TBA

XPANDR1 - Expander Module
Allows up to 128 8-bit analog inputs (8 AIM16 Modules) to be connected to one system. — TBA

PROTECT YOUR PROGRAM
by Len Lindsay

Here is an easy way to prevent anyone from listing any lines of your program that you choose. (or the whole program for that matter) Of course the program will still run. It takes an additional 5 bytes per protected line. To get an idea of what I'm talking about type in this short 1 line program:

```
10[5'PI']"TEST"
```

10 ↑↑↑↑↑↑↑?"TEST"

Make sure you try it, one minute is all it takes. Type it just the way it is listed. There are 5 'PI's between the line number and the first command. Make sure to include them!!! Now list your program. Line 10 should list for you. The 5 'PI's should still be there right after the line number and 1 space. Now just one thing left to do. Type in this POKE:

```
POKE 1029,0
```

That was the magic word. Now list your program. Notice that line 10 is not listed. Run it to show that it is still there.

Here is what's going on: You should have read and understood the article on program overlays to understand what is happening. BUT, even if you don't understand, you can still easily use this as I will show you soon. Location 1029 is where your program's first line begins (1024 is 0, 1025 & 1026 give the forward chain, and 1027 & 1028 give the current line number.) I haven't fully figured this out but here are my suspisions.

Notice on the 2nd page of Mike Stone's article on program overlays, 1/3 down the right hand column it says:(SEE PAGE 57)

"Locations 201 and 202 always contain the address of the next instruction (during program execution). Actually the location of the '0' between instructions."

What we are doing is putting in a value of '0' right where our program commands are supposed to start. This confuses the PET while listing your program. I hope someone else will write with a better explanation.

EASY TO USE -
Here is all you do to have any line not listed. Type 5 'PI's between the line number and the first command (or insert 5 'PI's into an existing line). When every line that you want NOT listed has 5 'PI's correctly placed RUN my 4 line program listed on this page (called 5 'PI' FIND / CORRECT / SELFERASE). You can relocate it to anywhere with a few changes, but I have it set up to work with any program not using the first 5 lines. It finds every group of 5 'PI's and changes the first one to a value of '0'. ('PI' has a value of 255)

For your convenience I wrote a short DEMO program that illustrates very well the principal of what is going on. It is listed on this page. Simply type it in and RUN it.

Please note: for you experimenters, 'PI' is not the only value that works. Try some others (like try the shifted left arrow right above the 'PI' key) Please write with your findings. Hopefully ideas here can be applied elsewhere with other results.

SEE LISTINGS IN NEXT COLUMN ↗ above

DEMO OF the NO-LIST CONCEPT

```
0 GOTO10:REM1-9 HAVE 5 'PI' AFTER LN#
1 [5'PI']PRINT"YOU CAN'T SEE LINE 1
2 [5'PI']PRINT"ONCE YOU GOTO 100.
3 [5'PI']PRINT"THIS MIGHT BE USEFUL
4 [5'PI']PRINT"WHO KNOWS???????
5 [5'PI']FORD=1TO10:PRINT"[9RIGHT,RVS]I KNOW "
6 [5'PI']NEXTD
7 [5'PI']REM NEXT LINE WAITS ABOUT 10 SECONDS
8 [5'PI']POKE513,0:WAIT513,10
9 [5'PI']REM END OF EXAMPLE OF 5'PI' WHICH  WON'T LIST AFTER A GOTO100
10 PRINT"[CLR]ANY LINES YOU WISH [RVS]NOT[RVSOFF] TO BE LISTED
12 PRINT"TYPE 5 'PI''S IMMEDIATELY AFTER THE LINE #"
15 PRINT:PRINT"THEN ENTER YOUR BASIC LINE AS USUAL
16 PRINT"IMMEDIATELY AFTER THE 5TH 'PI'.
17 PRINT:PRINT"RUN THE PROGRAM. THEN ENTER
18 PRINT"GOTO100      (AND WAIT 10 SECONDS)
20 PRINT"AFTER LOOKING AT LINES 1 TO 9.
50 PRINT"[12DOWN]RUN 1":PRINT"[2DOWN]GOTO100[HOME,8DOWN]"
99 LIST1-9
100 FORZ=1024TO2000
200 IFPEEK(Z)<>255GOTO900
300 FORX=1TO4
310 IFPEEK(Z+X)-255THENX=4:NEXTX:GOTO900
320 NEXTX
500 POKEZ,0
900 NEXTZ
999 GOTO1
```

```
0 REM***5 'PI' FIND / CORRECT / SELFERASE -BY LEN LINDSAY FOR UNLISTABLE LINES
1 FORZ=1024TO1999:IFPEEK(Z)<>255GOTO4
2 FORX=1TO4:IFPEEK(Z+X)-255THENX=4:NEXTX:Z=Z+5:GOTO4
3 NEXTX:POKEZ,0
4 NEXTZ:T"[CLR,2DOWN]":POKE525,10:FORI=1TO4:PRINTI:POKE526+I,13:NEXTI:PRINT"[HOME]":END
```

TRY SOME OF THESE:

```
POKE 525,0 -- tells PET no keys have been hit.
WAIT 525,1 -- then waits till the keyboard buffer has one
              keystroke registered and then continues.
WAIT 525,5 -- then waits till the keyboard buffer has five
              keystrokes registered.
```

WAIT 59456,32,32 -- waits for verticle retrace of screen.

CLEAR the screen and then type in SYS(57620)

Type in a real short program of a couple of lines.
Then enter directly:

```
  FN$="TEST"
```

Now save your TEST program with:

```
  SAVE FN$
```

PET will reply:

```
  OK
  WRITING TEST
```

Thus if every program you have starts with line 0:

```
  0 FN$="PROGRAM NAME"
```

You then could save every program with:

```
  SAVE FN$
```

and they all would be saved with the correct file name.

How about this: Is READY a leagal command??

To have your currently running program load another program for you (and preserve all variables) have it execute a line:

```
  500 LOAD : GOTO 10 : REM the GOTO must use the new programs
                           starting line number (or any
                           other line to start on.
```

(yes READY is legal. PET reads it as READ Y - you get OUT OF DATA error if you carriage return with the cursor over the READY message)

```
  ***RENUMBER***
59900 REM LIST THIS PROGRAM, LOAD TARGET PROGRAM, "RETURN" 60000-, RUN 60000
60000 INPUT "RENUMBER OLD LINE NUMBERS FROM";L1: INPUT "THROUGH";L2
60010 INPUT "AS NEW LINE NUMBERS FROM";L: INPUT "IN STEPS OF";D
60020 K=1025: G=256
60030 N=PEEK(K+2)+G*PEEK(K+3)
60040 IF N=0 OR N>L2 GOTO 60000
60050 IF N>=L1 THEN PRINT N,L: POKE K+2,L-INT(L/G)*G: POKE K+3,INT(L/G): L=L+D
60060 K=PEEK(K)+G*PEEK(K+1): GOTO 60030
```

G-O-O-D N-E-W-S

Beginning with their JAN 79 issue, KILOBAUD will have a monthly column for PET users. The column will be written by Len Lindsay, whom you all know. With Kilobaud's permission sections of the first column are reprinted here.

With over 100 companies supporting the PET you can expect to be able to get almost any plug in accessory you would want. You're right! The first things on most users lists are a printer, floppy disc, extra memory, and full sized keyboard.

Commodore first announced their printer early last summer, expected delivery in late August. The price has since then gone up $100 to $695 and delivery is now indefinite, probably March or later. But there are several adapters on the market to allow any RS-232 printer to be hooked to the PET.

Connecticut Microcomputer,(150 Pocono Rd, Brookfield, CT 06804), has a printer adapter for $169 completely assembled with case, power and cables, and the Networks (5924 Quiet Slope Dr, San Diego, CA 92120) have a dual channel, bidirectional RS-232 module for $280, assembled.

Two companies now have floppy disc modules for the PET: Convenience Living Systems (648 Sheraton Dr, Sunnyvale, CA 94087) and CGRS Microtec (PO Box 368, Southampton, PA 18966). Commodore supposedly will have a dual mini-floppy for $1000, but don't expect to get one till next summer.

The PET is extremely memory efficient, and you will find that even a 16K program can be coded into an 8K PET. Thus for ordinary use, 8K should be enough. There are, however, several memory expansion modules available now. (None from Commodore yet).

Convenience Living Systems have the ExpandaPET module, 16K for $399. Computer Mart Systems (13 East 30th St, New York, NY 10016) has the PME-1 with 16K for $550. International Technical Systems (PO Box 264, Woodridge, VA 22194) has the PME-8K for $279.

Due to the PET's small keyboard, most users wish to have a full sized keyboard to plug in, but still keep the original keyboard functional. Excel Company (2241 Tamalpais Ave, El Cerrito, CA 94530) has an adapter for $100 that allows you to plug in any ASCII keyboard and use it simultaneously with the original keyboard. For $175 they have a full size keyboard you just plug in and use. New England Electronics (248 Bridge St, Springfield, MA 01103) has a full size keyboard for about $125 that operates simultaneously with the PET keyboard.

Some hints on programming with your PET.

Use lower case whenever the user has to read alot of text, such as in instructions. To put the PET into lower case mode simply add a line:

```
225 POKE 59468,14:REM LOWER CASE MODE
```

To return to graphics mode:

```
280 POKE 59468,12
```

Don't assume that the PET will be in graphics mode. One of your first lines should poke in the mode you wish to use first. Throughout your program you can switch from graphics to lower case and back again.

The PET has a GET command. This allows an easy way to input information while your program is running without having to hit the return key. A typical example follows:

-CONTINUED-

-continued-

```
100 PRINT"Do you need instructions?"
110 GETA$: IF A$="" THEN GOTO 110
120 IF A$="Y" THEN GOSUB 1000:REM INSTRUCTIONS
START AT 1000
130 Your program continues here.
```

Remember, your instructions are in a subroutine beginning at 1000. The last command should be:

```
1999 RETURN (use the appropriate line number)
```

Another use of the GET command is for indefinite delays. For example:

```
1500 PRINT"This is the end of instructions"
1510 PRINT"Hit any key to continue"
1520 GET A$:IF A$="" THEN GOTO 1520
1530 Program continues here after waiting for the
user to hit a key
```

Clear the screen before starting. Use a line such as:

```
60 PRINT"[CLR]":REM CLEAR THE SCREEN
```

As with the line above, I will use standard conventions for listing PET graphics and special keys.

Use KEY CAP identifiers if possible and enclose them in square brackets (use regular parenthesis if square brackets are unavailable).

Use a number before an item to show how many times it is to be repeated.

Enclose consecutive special keys within the same brackets, separated by commas.

For example:

```
230 ?"[HOME]":REM PRINT A HEART 3 SPACES DOWN FROM
THE TOP LEFT CORNER
```

You type:

2 3 0 ? " the HOME key CURSOR DOWN 3 times shift S " : R E M P R I N T A etc.

Remember, a capital letter inside brackets means to type the shifted character.

If your PET has a problem take it to your dealer, he is authorized for repairs. If you bought it direct from Commodore, ship it back to them for repairs. Use the original container, but add more solid cushioning, such as newspapers, especially in the corners. Don't use small pieces of styrofoam. Ship it via UPS to: Commodore, Customer Services, 901 California Ave, Palo Alto, CA 94304. Commodore's Customer Services phone number is (415) 327-4030.

To function reliably your tape heads should be properly aligned, cleaned and demagnetized every 10 hours of use. It is possible that 30% of the PETs have misaligned tape heads when received. Aligning them is quite touchy and should be done by a trained technician. Cleaning your tape heads is a simple matter. Just take a Q-tip, dip it in some tape head cleaner (or alchohol), and gently clean the tape head surface which contacts the tape as well as the rollers. Let it completely dry before using a tape. Demagnetizing your tape heads is also easy, but requires a "Demagnetizer". These can be purchased at most stereo stores for under $10. Make sure that no cassetes are within 5 feet of the demagnetizer or they could be ruined. Turn on the demagnetizer 3 feet away from your tape heads and slowly bring the tip of it towards the heads until you gently touch them. Now slowly bring the demagnetizer away from the recorder. Don't turn it off until you are 3 feet away again.

With KILOBAUD's permission, here is a preprint of my PET POURI in the FEB. 1979 issue of KILOBAUD:

Last month I listed some accesories for the PET including printers, floppy discs, keyboards, and extra memory. Of course there are many more. Microsignal (Box 161988, Sacto CA 95816) is marketing a voice input module called COMPUVOX for $29.95. With this unit your PET can recognize sound and no sound. It can not distinguish between different words. Thus, "one" and "two" are equivalent. But, "go down" and "up" ARE different. "Go down" is 2 sounds and "up" is one sound. So to have PET recognize 4 commands you might use: "up", "go down", "now turn right", and "go to your left". Microsignal also markets a sound output unit (a speaker) called COMPUTONE for $14.95. With a speaker attached to your PET you can add sound effects to your programs and even have the PET play songs. (ie the Theme from Star Wars is available from the PET Gazette) COMPUTONE is compatible with the proposed sound conventions which are explained in this column. The MUSIC BOX, sold by New England Electronics (248 Bridge St, Springfield, MA 01103) for $49.95, is not compatible with the sound conventions, but is very professionally packaged and comes with programs allowing you to actually compose music with your PET.

Joysticks are also available that just plug into your PET from Coyote Electronics (PO Box 101, Coyote, CA 95013) for $50 for a coplete package deal. They have a beautiful connector box which plugs into your User Port. There are no bare wires and appears to be very safe for use around children. The joysticks then simply plug into this connection box. It is very well designed. Along with the box you get 2 Atari joysticks, a test program, 2 game tapes, and a very complete 3 part instruction series all on cassette ready to load and go. Their clear and detailed programming instructions make it easy to add joystick control to all your games.

A digital plotter for the PET is available for $195 from X and Y Enterprises (PO Box 796, Huntsville, AL 35804) in kit form ($249 assembled). A light pen for the PET costs only $24.95 from 3 G Company (Rt 3, Box 28A, Gaston, OR 97119). Your PET can then recognize which part of the screen you touch with the light pen.

If you wish you could use some of the S-100 boards you will be interested in BETSI, an S-100 adapter for the PET. It is made by Forethought Products (87070 Dukhobor Rd, Eugene, OR 97402). You may remember them for their KIMSI S-100 adapter for the KIM. BETSI costs $119 as a kit or $165 assembled.

SOFTWARE

As you know, the PET comes with Microsoft BASIC in ROM. Now you can use other high level languages with your PET.

PILOT is an easy language to learn and use. Invented by John Starkweather, it is most useful with children. Programming is easy since there only are 5 commands (T: (type), A: (ask), M: (match), J: (jump), and C: (compute)). The C: command allows you to use most BASIC commands if you wish. It is available from the Peninsula School Computer Project, Peninsula School, Peninsula Way, Menlo Park, CA 94025. For only $19.95 you get the PILOT interpreter on cassette along with 5 sample game programs written in PILOT. Their 24 page manual includes program listings and tips on how to use PILOT.

-continued-

-continued-

FORTH is a language now frequently discussed. Fortunately there is a version available for the PET appropriately called: PETFORTH. It can be obtained from Programma Consultants, 3400 Wilshire Blvd, Los Angeles, CA 90010 for $35. FORTH is a structured language that can run faster than its equivalent assembly code might. PETFORTH works and will be supported.

Simulations are often the most exciting and realistic of the computer games. Personal Software (PO Box 136-L, Cambridge, MA 02138) has several very well done simulations for the PET. KINGDOM is one of my favorites. It is a BIG improvement over the varieties of H4AMURABI I've played. You are the ruler of a kingdom and must make decisions such as how much to feed your people, how much grain to plant, and to buy or sell land. Background information needed to make your decisions is given at the beginning. It is realistic with rats eating part of your grain and attacks by the Hunns, killing some of your people. KINGDOM, POKER, MATADOR, and ONE QUEEN are on one cassette for $14.95. Another cassette titled STIMULATING SIMULATIONS is also $14.95. It includes: a 64 page instruction book and 10 simulation games.

Mike Richter has developed a very sophisticated simulation series. He refers to them as HYPERGAMES. In these, you and your party of GOODGUYS must find your way through a computer generated "WORLD" in search of treasure. BADGUYS are also in this "WORLD" and try to stop you. You are affected by your domain as well as by the BADGUYS. The most ingenious part about Mike's first HYPERGAME is that the program is ALL variables. A specific game is created with a data tape which defines who the GOODGUYS and BADGUYS are, how they affect each other, and the layout of the "WORLD" along with its affects on you. FIRSTWORLD is Mike's first specific HYPERGAME. You and a FIGHTER, BURGLAR, WITCH, and PRIEST are the GOODGUYS. You meet the DRAGON, a SWARM OF GNATS, and an OGRE along your way in search of the treasure. Each encounter is a battle. Some of your party may be injured. Fortunately, injuries heal as time passes, so with luck you will make it through the RUSHING RIVER, WATERFALL, KANSAS CYCLONE, and the other trecherous areas of FIRSTWORLD. But then you must find the EXIT (which is not the place as where you came in). A wonderful game.

Mike also has a program called HYPERWRITER which you use to create data tapes for specific games. That data could then be used with any HYPERGAME (ie several different HYPERGAME programs are being devised). With it Mike created FIRSTWORLD and I have created a specific game TEST ISLAND which works beautifully with HYPERGAME 1.

This series is still being documented and human engineered and thus is not yet being marketed. Further information will be in next months column, or feel free to contact Mike at 2600 Colby Ave, Los Angeles, CA 90064.

SOUND PROGRAMMING

You have 3 POKE locations that together produce sound.
POKE 59467,16 turns on the sound mode (and turns off your ability to use your tape units)
POKE 59464,X plays a note determined by X (X can be from 1-255, 1 is highest, 255 is lowest)
POKE 59466,Y allows you to change the octave. (3 octaves available, Y= 15, 51, 85. Y can be any integer from 1 to 255)
Each note stays on until another note beginns or it is turned off. At the end of every sound subroutine make sure to POKE a 0 in each location (to regain tape functions). Try this example:

-Continued-

-continued-

SOUND

```
3000 POKE59467,16:REM sound on
3010 POKE59466,51
3020 FOR P=1 TO 255
3030 :POKE59464,P:REM play the note
3040 NEXT P
3050 POKE59467,0: POKE59466,0: POKE59464,0
3060 REM sound off / tape functional
```

PAPERWARE

Greg Yob is writing THE PET MANUAL which will be published by MIND'S EYE SOFTWARE (PO Box 354, Palo Alto, CA 94301). This comprehensive manual should be available February 1979 for about $20.

Another PET manual is being marketed by PETABLE (Box 461, Philipsburg, PA 16866). Their ads say quote "Ever look at Radio Shack's 232 pg. owner's manual and wish Commodore had one? We have just published 'PETABLE', an introduction to PET Basic, graphics, and capabilities. It includes programs, exercises, software/hardware sources, a periodical index, and much more. Send check or money order for $4.95 to: PETABLE, PO Box 461, Philipsburg, PA 16866". It is implied that their manual is as good as Radio Shack's (who DOES have an excellent manual). PETABLE is 41 pages (22 sheets of 8 1/2 by 11 paper stapled together) and does NOT even have a table of contents. Some pages have words going right to the papers edge (and a few letters missing over the edge). This is doubly bad since they staple the booklet together down the left side. Thus many words are not readable, hidden in the folds. Their software/hardware sources is merely listing Newman Computer Exchange and advising you to write for their catalogue of PET products. PETABLE contains MANY errors and the material is VERY poorly presented. Many important items are mentioned but no information is given. They just say try it and see what happens. For example, page 7 says, "Take a look at the boolean operatives, AND,NOT,OR, on Page 45 of your PET manual and try using them with string variables." That was the complete section!! It is very representative of the manual. This poorly organized "manual" will probably confuse rather than help. I recommend avoiding it.

An excellent source of technical information on the PET is the PET NEWSLETTER (SPHINX). 6 issues cost $4.50 and can be ordered from: PET Newsletter / Computer Project, Lawrence Hall of Science, University of California, Berkeley, CA 94720. Make checks payable to: Regents of the Univ. of Calif. Their newsletter has contained memory maps, machine language programs, explanations of various PET functions, and I/O information. Highly recommended.

If you hope to do any machine language programming you will be interested in these books: PROGRAMMING A MICROCOMPUTER: 6502 by Caxton Foster, $8.95, published by Addison Wesley, Reading, MA 01867. Designed especially for KIM, PET and Apple users. You will also want the 2 manuals from MOS Technology - 6500 PROGRAMMING MANUAL and 6500 HARDWARE MANUAL. Prices vary. AB Computers (PO Box 104, Perkasie, PA 18944) sells them for $6.50 each.

-continued-

```
 0 REM***AUTO LINE NUMBERER***
 3 NS= 100:REM THIS IS THE NEXT LINE NUMBER
 4 PRINT"[CLR,3DOWN]";NS;
 5 GET K$:IF K$="" GOTO 5
 6 PRINTK$;:IF ASC(K$)<>13 GOTO 5
 7 NS=NS+10:PRINT"3NS=";NS:PRINT"RUN 3[HOME]"
 8 POKE 525,4:FOR I=1TO 4:POKE525+I,13:NEXT:END
READY.
```

-continued-

PROGRAMMING TIPS

Last month we discussed the GET command among other things. This month's EXAMPLE program uses the GET command differently in line 300. Location 525 tells your PET how many keys have been pressed and are stored in the key board buffer (locations 527-536). In line 300 we first POKE a 0 in the in the keyboard buffer counter so the PET thinks no keys have been pressed. Then we use the WAIT command to tell our PET to do nothing, just WAIT until it's keyboard counter says a key has been pressed and stored in the keyboard buffer. It will then continue executing the program. The next statement tells it to GET a character (we are sure there is 1 character in the keyboard buffer now). Thus a sophisticated GET routine is:

```
 POKE 525,0 :WAIT 525,1 :GET A$
```

You then have the option of printing that character or not.

This month the EXAMPLE program was written to illustrate the ON...GOSUB commands. Here is the program narrative:

In PET BASIC variables can be up to 255 charaters long. Thus you can name variables with recognizable titles, making reading the program listing easier. You must avoid using variables that contain any of the reserved BASIC commands such as ON, TO, OR, AND, and LET. This applies to such commands as:

```
 If Q=RIGHT OR Q=LEFT THEN GOTO 710
```

Your PET does not like that line because RIGHT OR includes the TO command (PET ignores spaces so RIGHTOR contains TO). Thus BOTTOM becomes BOTTUM (to avoid the TO) and DIRECTION becomes DIRECTIN (to avoid the ON).

This program will allow you to move a ball around the screen using your numeric keypad for directions. There are no PRINT commands other than line 60 which clears the screen. Your PET uses memory locations 32768 to 33767 for the screen display. Thus by POKEing into those locations you can write on your screen. There are 25 lines of 40 characters (1000 total).

First we assign variables correct numbers to be used in the proram with POKE statements. Also note in line 40 we identify the center of the screen. PET accepts the variable SCREENSTART but will remember its value as belonging SC. (The first two letters are the only significant letters to the PET.) Later in the program I use variables SCREENNOW and SCREENOLD. The PET can not distinguish between them but they help us keep track of our program.

Lines 100 to 170 draw a border line around your screen. This is nice for the user to see where the sides are and will be used again in line 610 to make sure our ball doesn't run off the screen. NOTE: as you go across the top and bottom your position increases by 1. But as you go down your position increases by 40. Thus the side walls are multiplied by 40 as I go down.

Lines 300 to 320 get the direction to move. NOTE: we GET DI$. If you say GET DI the PET expects a number. If you then hit any other key (such as a T) you get the cryptic message REDO FROM START. Once we have the string variable we convert it to a numeric variable in line 310. The VAL command returns the VALUE of the string. The value of letters and non-numeric characters is always 0. Thus line 320 tells the PET to GET another character if the value is 0. Yes, the number 0 has the value of 0 too, but we are looking only for the numbers 1 - 9.

-continued-

-continued-

```
3 REM*****************************
4 REM***** ON GOSUB EXAMPLE *****
5 REM*****************************
6 REM BY L LINDSAY
7 REM*****************************
8 REM***** ASSIGN POKE VALUES *****
9 REM*****************************
10 BALL=81
20 TRAIL=87
30 UPWALL=98
32 BOTTUMWALL=226
34 LEFTWALL=225
36 RIGHTWALL=97
40 SCREENSTART=32768+500
50 POKE59468,12:REM GRAPHICS MODE
60 PRINT"3":REM TYPE 60 ?"[CLR]"
97 REM************************
98 REM***** DRAW BORDERS *****
99 REM************************
100 FOR I=1 TO 25
110 :POKE 32767+(I*40),RIGHTWALL
120 :POKE 32767+(I*40)+1,LEFTWALL
130 NEXTI
140 FOR I=1 TO 40
150 :POKE 32767+I,UPWALL
160 :POKE 32767+960+I,BOTTUMWALL
170 NEXT I
197 REM*********************************
198 REM**** ILLUSTRATE DIRECTIONS ****
199 REM*********************************
200 REM
210 REM   7  8  9
220 REM    \ ! /
230 REM     \!/
240 REM  4---5---6
250 REM     /!\
260 REM    / ! \
270 REM   1  2  3
280 REM
297 REM*************************
298 REM***** GET DIRECTION *****
299 REM*************************
300 POKE525,0:WAIT525,1:GET DIRECTIN$
310 DIRECTIN=VAL(DIRECTIN$)
320 IF DIRECTIN=0 THEN GOTO 300
397 REM*****************************
398 REM***** ON GOSUB SECTION *****
399 REM*****************************
400 ON DIRECTIN GOSUB 1000,2000,3000,4000,5000,6000,7000,8000,9000
500 POKE SCREENOLD,TRAIL
600 Q=PEEK(SCREENOLD+ADJUST)
610 IF Q=UP OR Q=BOTTUM OR Q=RIGH OR Q=LEFT THEN GOTO 710
700 SCREENNOW=SCREENOLD+ADJUST
710 POKE SCREENNOW,BALL
720 GOTO300:REM GET NEXT DIRECTION
996 END:REM SUBROUTINES FOLLOW
997 REM*************************
998 REM***** GOSUB ROUTINES *****
999 REM*************************
1000 ADJUST= 39:RETURN:REM DIRECTION IS 1
2000 ADJUST= 40:RETURN:REM DIRECTION IS 2
3000 ADJUST= 41:RETURN:REM DIRECTION IS 3
4000 ADJUST= -1:RETURN:REM DIRECTION IS 4
5000 ADJUST=  0:RETURN:REM DIRECTION IS 5
6000 ADJUST=  1:RETURN:REM DIRECTION IS 6
7000 ADJUST=-41:RETURN:REM DIRECTION IS 7
8000 ADJUST=-40:RETURN:REM DIRECTION IS 8
9000 ADJUST=-39:RETURN:REM DIRECTION IS 9
```

Line 400 is our ON...GOSUB command. It works like this:

ON A GOSUB 1, 2, 3

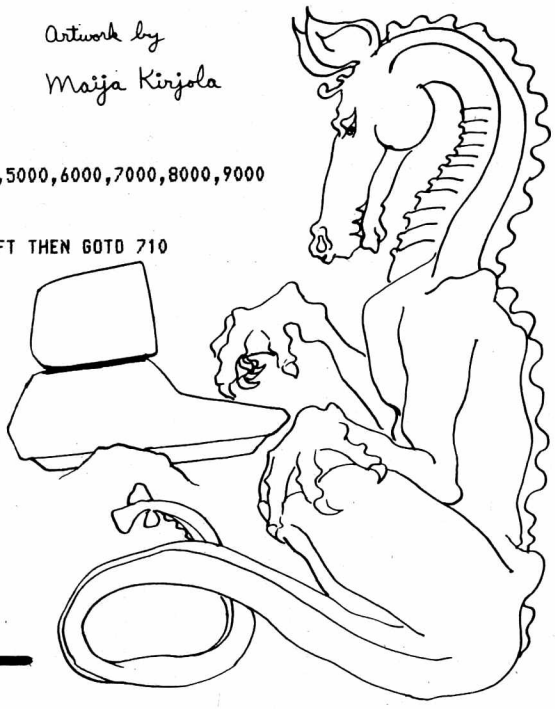
The value of A determines where the PET will go next. If A is 1 it goes to the line number immediately following the word GOSUB. If A is a 2 it goes to the second line number listed after the word GOSUB. If the value of A is not an integer the fractional part (right of the decimal point) is eliminated. Thus 2.458 is seen as 2. To make line 400 easier to follow I GOSUB 1000 if DI is 1, 2000 if DI is 2, and so on through 9000 if DI is 9.

ADJUST is the variable used to update our current position on the screen. Line 40 puts us in the center to start. Here is how we move: If you hit a 2 the ON...GOSUB sends us to line 2000. Since 2 means DOWN we must add 40 to SCREEN to get the position 1 unit down. So we say ADJUST=40 NOTE: since this is a subroutine we must end it with a RETURN. If you want to go left you hit the 4 which sends us to line 4000. To go 1 unit left we must add a -1 to our current position, so ADJUST=-1. Thus line 400 with the subroutines in lines 1000 to 9000 tell us how to adjust our position.

Lines 500 to 720 move the ball and leave a trail behind so you can tell where you have been. First line 500 POKEs a trail into where we are now. Line 710 POKEs a ball into where we are going. Lines 600 and 610 check to make sure we didn't hit a wall. If we did, we skip line 700 which updates our position and just go to line 710 to POKE a ball back in the old position which we did not update.

Next month our EXAMPLE program will show how to have your PET actually change your program for you WHILE IT IS RUNNING. You thus have something to look forward to.

Artwork by
Maija Kirjola



TRY THIS---If you have a program in memory and want to RUN it. You don't have to type the word R U N. Just type any garbage letters (not numbers) and then hit SHIFT RUN key. Your program will run for you.

REVIEW
PLAY-GRAMS
$10
Reich Engineering
635 Giannini Dr
Santa Clara, CA 95051

SLOT MACHINE- This program simulates a slot machine. Up to 4 players can play and place bets varying from 1 to 9 dollars. A 3 dimensional slot machine is displayed, the player places his bet, the coins are simulated going into the coin slot, the handle is pulled down, the symbols twirl around in the 3 windows - and just like Vegas (if you win) - the money pours out of the coin return. (Based upon an odds table that is also shown on the screen) Your current money balance is also displayed.

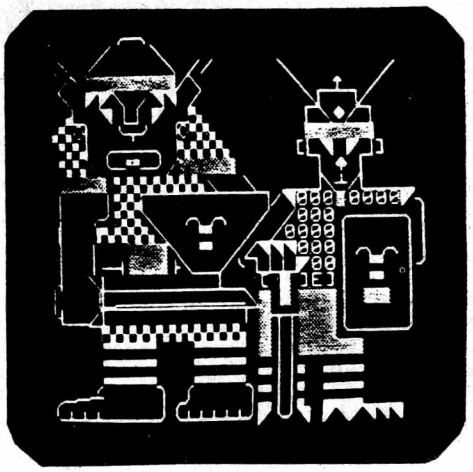
All input is thru GET statements, therefore, you do not have to hit return. The graphics are great! This would make an excellent party game.

SHARKS - You are swimming in a lagoon and suddenly 3 sharks attack you! Fortunately you have a spear gun with 5 spears you can fire. But now the bad news - one of the sharks is CHAWS - and it takes 2 spears to kill him! The object of the game is to swim to shore without being devoured. You control the direction of the swimmer and the firing if the spear gun. This is a fun (and frustrating) game. (Out of 50 tries I made it to shore only 5 times - bad swimming?)

Both SLOT MACHINE and SHARKS have a unique and clever method of protecting the programs from unauthorized copying.

HANGMAN - This is the best version of this educational game I have ever seen! A gallows is displayed with the noose hanging down and steps leading up to it. A "stick man" is shown at the bottom of the steps. You then guess the letters in the variable length word the program chose. For every guess you miss the stick man takes a step up the stairs. Eventually he is underneath the noose. On the next miss he reaches up and places the noose around his own neck and on the next miss the floor drops out and he is hung - with arms and legs flailing (that's some punishment for being a bad speller)

All three programs are well written, have good instructions, excellent graphics, and would make a good addition to anyone's program library.
REVIEW by Bill Coughlin



COME PLAY

Swords and Sorcery!

with us and your PET

Adapted from Bruce Turrie's swords and sorcery! for the 6800 (Kilobaud, aug. 1978) with animated introduction

Fight goblins and trolls in the dark forest of the necromancer on your way to rescue the princess

Wolves and nymphs and satyrs and oracles!! This one is really fun! $10

send check, cash or money order to:
BIOSYSTEMS RESEARCH, INC. p.o. box 160272
Miami, Florida 33116

PET*
CARRYING CASE

- Vulcanized Cellulose Fibre Construction
- Plywood Reinforcement
- Metal Corners & Edges
- 3 Handles (one over C.G.)
- Lock with Keys
- Permanent Foam Cushioning Shaped to Allow for Cooling
- Take-apart Hinges
- Shipping Pre-paid Anywhere in Contig. U.S.
- $66.00
- Dealer Inquiries Invited

MAKE CHECKS PAYABLE TO:
PACIFIC DATA PRODUCTS INC., 3835 E. OLIVO CT., CAMARILLO, CA. 93010
NO COD'S - CALIFORNIA RESIDENTS ADD 6% TAX.

* TRADEMARK OF COMMODORE

With KILOBAUD's permission, here is a preprint of my PET POURI in the MARCH 1979 issue of KILOBAUD:

PET ACCESSORIES

The PET is rapidly becoming a well supported personal computer, though NOT by Commodore. Several companies now are offering full sized plug in keyboards. These are only announcements, I have not yet seen any of these.

PERK is available from GEORGE RISK INDUSTRIES (GRI Plaza, Kimball, NEB 69145) for $229.95. It shares the PET internal keyboard interface allowing both keyboards to be used. More than one PERK keyboard can be attached to a single PET.

The BIG-KB Keyboard from SKYLES ELECTRIC WORKS (10301 Stonydale Dr, Cupertino, CA 95014) also plugs into the PET internal keyboard interface, but apparently both can not operate simultaneously. For $125 you get a keyboard including a numeric keypad.

As mentioned in the JAN issue, NEW ENGLAND ELECTRONICS (248 Bridge St, Springfield, MA 01103) manufactures a fullsized keyboard. The announced price is $139.95. Finally, EXCEL (2241 Tamalpais, El Cerrito, CA 94530) markets a keyboard for $175.

SOFTWARE WORTH MENTIONING

REVIEW

The SOFTWARE SHOPPE (PO Box 271, Berwyn, IL 60402) has some excellent software, using extensive machine language for speed and versatility. Having seen and used their Extended Graphics package I rate it SUPERB. It doesn't add any graphics, but allows you to use PET graphics easily, for results not possible using BASIC. Channel 6 cable TV in Madison recently had a one hour special presentation of computers in the home. I was a guest for that show, and of course brought my PET and some interesting programs (including the Extended Graphics Package). It took less than 5 minutes to set up and RUN an amazing animation of the show's logo, using Extended Graphics routines. Among many other uses, these routines allow you to animate a whole section of any rectangular size on the screen. Their animated logo was the hit of the show. The Software Shoppe also has a resequence program using machine language. It renumbers your program and changes all your GOSUB, GOTO, and IF THEN target lines accordingly.

REVIEW

MICRO SOFTWARE SYSTEMS (PO Box 1442, Woodbridge, VA 22193) has a Basic Utilities Program called Micro-SET I. With this program you can delete blocks of lines, create ASCII tapes of any program, add routines from tape to the program in the PET, and Renumber the lines. It renumbers the lines only, but tells you which lines have GOTO, GOSUB, or IF THEN and what to change the target line to.

REVIEW

CURSOR (Box 550, Goleta, CA 93017) has my highest recomendations. You subscribe to Cursor like any magazine, $24 for 12 issues. Each issue comes by First Class mail on a cassette ready to LOAD and RUN on your PET. Each issue contains about 6 GOOD programs. I have received the first 4 issues and have never had a problem loading the programs. It contains useful and educational programs as well as very unique and fun games.

-continued-

-continued-

nonREVIEW

PROGRAM (Box 461, Philipsburg, PA 16866) also is a cassette magazine, $27 for 12 issues. By all means avoid it. I have heard complaints that their tapes wouldn't load. Replacement tapes were not sent nor would they refund any money. If that isn't bad enough, I had the oppurtunity to see PROGRAM II. It was a complete disappointment. The first "program" was 12 lines long, (could be condensed to 7 lines) and did next to nothing. The second "program" was 5 lines long It showed (in 1 line) how to have the PET pause a few seconds. The third program was 6 lines long, and simply printed the PEEK value of address 515 when you hit a key. The last program was the longest, 17 lines, but had problems causing it to work improperly. Along with these 4 "programs" (if you can call them that) were a few editorial comments thanking people for sending in programs and asking for more, among other things. PROGRAM is put out by the same people that did PETABLE, which I mentioned last month.

LAST MINUTE ADDITION: I have just received a complimentary copy of PROGRAM II direct from PROGRAM. I found it rather odd that the tape they sent to me as PROGRAM II was completely different from the one that was sent to their subscriber. There were 3 programs on my tape: Memory Check, ZIP file, and Accounts Receivable. Their accompanying letter asked that I not review their products, quote, "until we can get things under control" end quote. You may draw your own conclusions about them.

SOFTWARE SURVEY
TOPIC: Fantasy Simulations

Each month I will choose a category of program types and review some of the best (and worst) programs available. Companies - please send in your programs so that you may be included in future reviews. Users - please send in your recommendations for good programs and warnings for poor ones. Future topics will include: Card games, Educational, Board games, Strategy games, etc.

REVIEW

I chose this category because I feel that simulations are one of the best recreational uses, and fantasy types are very enjoyable. There will probably be many more entries in this area soon, especially of the dungeon and dragon type. DEVILS DUNGEON by Engel Enterprises (PO Box 16612, Tampa, FL 33687) is a good example to begin with. It comes as a small booklet with the background story, sample run, program listing, flowchart, list of variables used, and possible modifications. If you would like it on tape ready to run contact Jon Staebell, 5102 Arrowhead Dr, Monona, WI 53716.

In this adventure you move about in a maze of caves, forever descending into the earth. Some caves contain drop-offs allowing you to move to a lower level. You NEVER can move back up. There is a lot of gold scattered throughout the caves. As you try to collect as much gold as you can, various Monsters attempt to stop you. You may fight the monster, run away, or use your magic wand. For each monster you kill and piece of gold you find you are given experience points. These may be traded in to add to your speed and strength. Encounters with monsters, demons, and poisonous gas all reduce your speed or strength. If either goes below zero you are declared dead. This is an exciting game well worth having. Jon's version has excellent sound effects as well.

-continued-

-continued-

WUMPUS might be considered a primitive form of a hunt simulation. It's program listing was printed in Kilobaud #2. It is available from several sources including Dr Daley (425 Grove Ave, Berrien Springs, MI 49103) and the PET Cassette Exchange (1929 Northport Dr, Room 6, Madison, WI 53704). The Wumpus live in underground caves. You enter their caves, try to find and kill a Wumpus and escape alive. Beware of pits and bats!

REVIEW

A step up from WUMPUS is QUEST, available from the Computer Project, Peninsula School, Peninsula Way, Menlo Park, CA 94025. QUEST is a find-the-treasure game that involves exploring caves with hidden clues and changing obstacles.

REVIEW

The August issue of Kilobaud had an article and program listing for SWORDS and SORCERY. This fantasy game was adapted for the PET by Biosystems Research (11550 SW 108 Ct, Miami, FL 33176) as a tape with a graphic introduction and complete game ready to run. Their graphic introduction is fantastic. The game itself is very simple to play (the program is complex). You wander through the forest, try to reach the princess, and find enough gold along the way to be worthy to marry her. You meet Trolls and Goblins as well as fall into pits. Since it is simple, children may enjoy it. However, I felt it was very boring - and I never found the princess during the several times I played it.

REVIEW

SWORDQUEST by Fantasy Software Games (PO Box 1683, Madison, WI 53701) is the only fantasy simulation I have seen with graphics and animation (and sound effects soon too). The program itself is very complex and has several machine language routines. It is well human engineered and easy to play - but challenging and exciting at the same time. You wander about a maze of tunnels, trying to find the room with the treasure. You can kill any monsters with your arrows (except for Giant Spiders, you need a Magic Arrow to assure a kill). The maze of tunnels is always shown on your screen, there is no scrolling. All monsters are invisible until you come within 4 steps of them. They then appear and charge at you, moving 3 spaces each turn. You can do two things for your turn, including move, shoot an arrow, and change weapons. You must decide to carry either your bow or your sword. You must use your sword to fight any monster that attacks you. The intricacies of this game are explained in the accompanying manual. The manual also relates the background story to the game. An amazing aspect of this well designed game is that it is protected, you cannot make a duplicate copy. (Unauthorized copies are illegal anyway)

REVIEW

Last, but definately not least is HUNT, by Mike Richter. It has been renamed since last month when I mentioned it as HYPERGAME 1. It is a game that really is a class in itself, a meta-game (in the sense of metaphysics or metamatmatics). The context is that of a search for a defined object. The object, the names and natures of the searchers, the names and effects of the antagonists, and the properties of the space in which the hunt is conducted (up to 16 regions) are all variables defined by a data tape.

HUNTWRITER, the second interactive program in this set, helps define and create data tapes to be used with HUNT, which changes with each new data tape. With the aid of HUNTWRITER one can change or construct new worlds for HUNT. And no knowledge of any computer language or adherence to the formalisms of programming are required (although it does demand clear thought).

-continued-

-continued-

FIRSTWORLD, FILMWORLD OF OZ, and HAUNTED HOUSE are 3 of the data tapes available now. Thus with less than 8K of RAM you can travel with Frodo through Middle Earth or trace adventures of King Arthur's court. And the user can set up this world without having to write a program.

HUNT is more than a fantastic interactive adventure. It is one way to involve non-programmers in software. It also is educational, both in the playing (map drawing, orginization) and in the creating. The parent and child can create their own world or a Freshman History project can recreate an era in history.

SIDELINES

You may not have almost 400 cassettes of PET programs to store like I do, but most PET users should have an organized and efficient method of storing programs on cassettes. I recommend using C-10 cassettes (5 minutes each side). Since rewind time is very minimal you can keep one program on each side for almost immediate access. I only have one program per tape, with the original version on side A and my improved / modified version on side B. I use only highest quality AGFA tape in a well made cassette housing.

Acceptable C-10 tapes are available from Dr Daley (425 Grove Ave, Berrien Springs, MI 49103) for $1.25 each or $0.84 each for 100 or more. The BEST tapes I have seen and used are from a store in Madison, Full Compass (55 N Dickinson, Washington Square Complex). Their tapes are the best and only $0.47 each for 100 or more.

Always rewind your tapes after each use before storing. Radio Shack sells well designed cassette folders which look like a book and hold 12 cassettes for $2.59. I use over 60 of these folders for my programs. If you have printed listings or instructions you would like to keep with your tapes you will be interested in a 3 ring binder with cassette folder built into its inside front and back. They are available from 20th Century Plastics (3628 Crenshaw Blvd, Los Angeles, CA 90016) for $7.50 each or $$5.50 each for 6. You also can get clear plastic protectors for your listings or documentation. They hold typing paper size sheets and have 3 ring binder holes on the side. They cast $0.20 each for 100 or more from 20th Century Plastics. You may also want full sized cassette labels so you can neatly type your program names. Ray Jacobs Audio (1419 Santa Fe Ave, Long Beach, CA 90813) sells rolls of 1000 cassette labels for $15.

-continued-

-continued-

PROGRAMMING HINTS

As promised last month, I will explain how you can alter a BASIC program while it is running. PET has a special buffer (memory) for the keyboard. Last month we touched on this with the short routine:

```
POKE 525,0 : WAIT 525,1 : GET A$
```

Location 525 tells the PET how many keys have been hit since it last looked. By POKEing a 0 there, PET thinks that no keys were hit. WAIT tells it to wait until a certain condition is met, and then to continue. Try this short example:

```
10 POKE 525,0 : WAIT 525,3 : INPUT A$
```

The PET won't do anything until 3 keys are hit, but it remembers what those keys were.

The keyboard buffer is from 527 to 536. By POKEing the correct values into this buffer and setting the counter at location 525 to the correct number of characters we can trick the PET into thinking that keys were actually hit. The POKE value of a carriage return is 13. Now for an application that you can use in most of your programs. Many game programs use arrays or many variables. Memory has to be saved for this so that when the program is run it will not run out of memory. You can use the DIM command to reserve memory for use while running the program. Why not use this same memory for your introduction and instructions??? We now will see how to do just that without using 1 extra byte of memory while your program is running.

There are two program listings, one is annotated with REMarks, the other is as you would type it in. If you begin your program at line 100 it is ready for your use just as it is. Simply add your introduction & instructions using PRINT statements on lines 1 to 89.

```
 75 ?"Do you understand?
 77 ?"If you say Yes everything you have just read
will be erased
 80 POKE 525,0:WAIT 525,1:GET Q$:IF Q$<>Y THEN RUN :
REM read again
 89 REM erase lines up to 99 follows
 90 POKE 59409,52 : F=1 : L=99
 92 B=92:?"[CLR,DOWN,DOWN]":FORI=FTOF+8:IFI>LTHENB=100
:NEXT:?"POKE59409,60:GOTO60040
 93 ?I:NEXTI:?"F="F+9":L="L":GOTO"B
 94 POKE 525,10:FORN=0TO9:POKE
527+N,13:NEXTN:?"[HOME]":END
 100 REM your program starts here.
```

To modify this to erase any specific block of lines just set F=first line to be erased and L=last line (line 90) and IF I>L THEN B=starting line after lines are erased (line 92). The POKE 59409,52 in line 90 turns off your video. Leave this out while you are testing the program. POKE 59409,60 turns the video back on (line 92)

Now you can add an introduction to all your programs. Simply fill up all available memory, saving only a few bytes for variables used in this routine and your intro. YES -- this routine erases itself too!

Ideas for this routine originally came from Mike Louder and Mike Richter. This concept has many more applications. Please write if you use this concept in another way.

-continued-

```
100 PRINT"First let's erase lines up to 100 to"
105 PRINT"make room for running the game."
106 REM   CURSOR UP PRINTS AS A "1", SO
107 REM   PART OF THE NEXT LINE SHOULD
108 REM   BE KEYED AS:
109 REM   110 PRINT"HIT A KEY [UP]"....
110 PRINT"HIT A KEY1":GET A$:IF A$="" GOTO 110
200 REM**DYNAMIC KEYBOARD**
205 REM   NEXT INSERT THE FIRST AND
206 REM   LAST LINES TO BE ERASED
210 FIRST LINE=1:LAST LINE=80
215 REM   THE NEXT LINE NUMBER SHOULD
216 REM   BE THE FIRST LINE OF THIS
217 REM   SUBROUTINE - USUALLY IT'S
218 REM   OWN LINE NUMBER
220 BEGIN=220
222 REM   THE POKE VALUE OF RETURN
223 REM   IS 13
225 CARRIAGE RETRN=13
227 REM   KEY NEXT LINE AS:
228 REM   230 PRINT"[CLR,DOWN,DOWN]"
229 REM   READY TO PRINT LINE NUMBERS
230 PRINT"3"
235 REM   I IS THE LINE NUMBERS TO
236 REM   BE ERASED
240 FOR I=FIRST LINE TO FIRST LINE+8
242 REM   IT STOPS ERASING AFTER I IS
243 REM   GREATER THAN YOUR CHECK LINE
244 REM   SET BEGIN TO THE NEXT LINE OF
245 REM   YOUR PROGRAM TO BE EXECUTED
247 IF I>LAST LINE THEN BEGIN=100
248 REM   NEXT PRINT THE LINE NUMBER
250 PRINT I
260 NEXT I
262 REM   IF ANY BASIC LINES ARE
266 REM   DELETED, ALL VARIABLES ARE
267 REM   SET TO 0 - NEXT WE PRINT THE
268 REM   INFO NEEDED TO CONTINUE THIS
269 REM   SUBROUTINE
270 PRINT"FIRST LINE=" FIRST+9;
271 PRINT":LAST LINE=" LAST ":GOTO" BEGIN
275 REM   NEXT THE KEYBOARD BUFFER IS
276 REM   FILLED WITH RETURNS
277 REM   THESE RETURN THE BLANK
278 REM   LINES NUMBERS WE JUST PRINTED
280 POKE525,10:FOR N=0 TO 9
281 POKE527+N,CARRIAGE RETRN
282 NEXT N
283 REM   KEY LINE 290 AS:
284 REM   290 PRINT"[HOME]":END
285 REM   THIS PUTS THE CURSOR TO THE
286 REM   HOME POSITION AND ENDS THE
287 REM   PROGRAM. THUS PET NOW LOOKS
288 REM   AT IT'S KEYBOARD BUFFER TO
289 REM   SEE WHAT KEYS HAVE BEEN HIT
290 PRINT"":END
291 REM   THE LINE ERASING ROUTINE
292 REM   IS OVER NOW
500 PROGRAM CONTINUES HERE
```

```
89 REM *** 4 LINE AUTO LINE ERASER ***
90 F=1:L=80:REM F=FIRST LINE TO BE ERASED, L=LAST LINE, B=BEGINNING LINE
91 B=91:PRINT"[CLR,DOWN,DOWN]":FORI=FTOF+8:IFI>LTHENB=500
92 PRINTI:NEXTI:PRINT"F="F+9":L="L":GOTO"B
93 POKE525,10:FORN=0TO9:POKE527+N,13:NEXTN:PRINT"[HOME]":END
500 PRINT"PROGRAM CONTINUES HERE"
```

-continued-

* *

If during a program you get the message PRESS PLAY & RECORD ON TAPE 1 you can avoid this if you wish, simply hit STOP, then type in C O N T

Our PET gave us this message once: BREAK IN 8245.05376

Has your PET done any weird things like that??? Please send us a note!!!

WAKE UP YOUR PET!

With UNIQUE and EXCITING programs from

"THE SOFTWARE SHOPPE"

EXTENDED GRAPHICS and STOCK MARKET ANALYSIS have quickly become best sellers. Now, we are proud to announce the newest and most significant addition to our line!

"A COMPLETE MACHINE LANGUAGE PROGRAMMING PACKAGE"

including an ASSEMBLER, a RELOCATING LOADER, and a DISASSEMBLER! The ASSEMBLER supports the use of variables, labels, and takes complete advantage of the PET'S powerful screen editing!

We are also offering a CALCULATOR SIMULATOR, an array of EXCITING GAMES, SURPRISES, and opportunities to obtain FREE programs!

It is impossible to do justice to our software in a single advertisement. Send TODAY for your FREE brochure describing all currently available software in detail. This is one mailing list you'll want to be on!

THE SOFTWARE SHOPPE
DEPT. G128
P.O. BOX 271
BERWYN, ILLINOIS 60402

You can use the versatile new BETSI to plug the more than 150 S-100 bus expansion boards directly into your PET*!

On a single PC card, BETSI has both interface circuitry and a 4-slot S-100 motherboard. With BETSI, you can instantly use the better than 150 boards developed for the S-100 bus. For expanding your PET's memory and I/O, BETSI gives you the interface. The single board has both the complete interface circuitry required and a 4-slot S-100 motherboard, plus an 80-pin PET connector. BETSI connects to any S-100 type power supply and plugs directly into the memory expansion connector on the side of your PET's case. And that's it. You need no additional cables, interfaces or backplanes. You don't have to modify your PET in any way, and BETSI doesn't interfere with PET's IEEE or parallel ports. And—when you want to move your system—BETSI instantly detaches from your PET.

BETSI is compatible with virtually all of the S-100 boards on the market, including memory and I/O boards. BETSI has an on-board controller that allows the use of the high-density low-power "Expandoram" dynamic memory board from S.D. Sales. This means you can expand your PET to its full 32K limit on a single S-100 card! Plus, you won't reduce PET's speed when you use either dynamic or static RAM expansion with BETSI. Additionally, BETSI has four on-board sockets and decoding circuitry for up to 8K of 2716-type PROM expansion (to make use of future PET software available on PROM). BETSI jumpers will address the PROMs anywhere within your PET's ROM area, too.

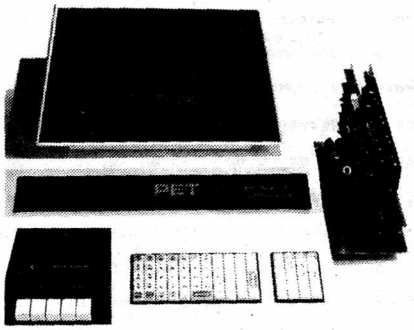
MAIL ORDERS ARE NORMALLY SHIPPED WITHIN 48 HOURS. VISA AND MASTER-CHARGE ORDERS ARE BOTH ACCEPTED.

The BETSI Interface/Motherboard Kit includes all components, a 100-pin connector, and complete assembly and operating instructions for $119.

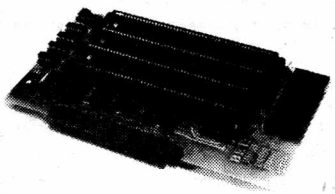
The Assembled BETSI board has four 100-pin connectors, complete operating instructions and a full 6-month Warranty for just $165.

FORETHOUGHT PRODUCTS
87070 Dukhobar Road #K
Eugene, Oregon 97402
Phone (503) 485-8575.

© 1978 Forethought Products



BETSI is the new Interface/Motherboard from Forethought Products—the makers of KIMSI™—which allows users of Commodore's PET Personal Computer to instantly work with the scores of memory and I/O boards developed for the S-100 (Imsai/Altair type) bus. BETSI is available from stock on a single 5½" x 10" printed circuit card.



BETSI is available off-the-shelf from your local dealer or (if they're out) directly from the manufacturer.

Ask about our memory prices, too!

*PET is a Commodore product.

ALL ARTICLES ON THIS PAGE REPRINTED FROM COMMODORE (ENGLAND) NEWSLETTER WITH THEIR PERMISSION!!!

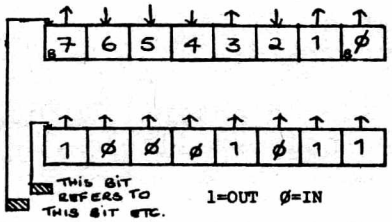
We are happy to be able to exchange info with Commodore in England. To subscribe to their newsletter send 10 pounds (15 pounds for overseas to the U.S.) to:
PET User Club Newsletter
Commodore Systems
360 Euston Rd
London, NW1 3BL, ENGLAND

USEFUL ADDRESSES

On the present page you will find an extensive map of the PET memory. This list is "home" generated and not from CBM U.S. so may contain slight inaccuracies, but all the major buffers and ram areas are correct. Also here are some common PIA addresses and how to use them.

User Port - data register 59424

User Port Data Direction 59426



The major portion of the user port consists of 8 connections at the rear of the PET. Whether these connections are used for INPUT or OUTPUT is up to the programmer. These 8 wires may be used as either input or output. Before using this 8 bit port you must first configure these wires as inputs or outputs. This is done by writing a byte to the data direction register at address 59459. In the example above bits 0, 1, 3 and 7 are configured as outputs. Bits 2,4,5 and 6 are configured as inputs. The bit that you see in the data direction register is generated by poke 59459, 139. In order to test a particular bit being used as an input in the data register (59471) one must peek 59471 and apply a "mask" in order to mask out unwanted bits. For instance to examine bit 2 we would use the expression PRINT PEEK (59471) AND 4. If the result of this expression is 0 then bit 2 of the data register (59471) has been held at 0 volts by the outside world.

To input data in BASIC without returning to BASIC command mode on receipt of a null string then an input statement can be simulated by a GET loop which contains additional statements to cope with DEL codes. This has the additional advantage that if there is a displayed frame on screen the frame characters will not be accepted as part of the input.

The attached listing shows the above routine. This starts at line 9000 and to use it, instead of INPUT A$ you put GOSUB 9000:A$=IN$.

```
8000 REM SUBROUTINE TO SIMULATE NON-PET      STANDARD INPUT STATEMENT
8010 REM STANDARD INPUT DOES NOT BREAK       ON RECEIPT OF A NULL STRING
8020 REM "INPUT" COULD BE ALSO BE            SIMULATED EASILY
8030 REM ZA$ IS DEFINED IN LINE 10
9000 IN$="":PRINT" ? ";
9010 GOSUB9070:PRINTZA$(ZB);:IFZ$=""THEN9010
9020 IFZ$=CHR$(13)THENPRINT" ":RETURN
9030 IFZ$=CHR$(20)THENONSGN(LEN(IN$))+1GOTO9010,9060
9040 PRINTZ$;:IN$=IN$+Z$:GOTO9010
9060 PRINTZ$;:IN$=MID$(IN$,1,LEN(IN$)-1):GOTO9010
9070 ZB=1+(ZB=1):FORZA=1TO60:GETZ$:IFZ$<>""THENRETURN
9080 NEXT:RETURN
```

PET MEMORY MAP

```
0000-0002   JUMP,USER ADDRESS
0005        CURSOR COLUMN
000A-005A   BASIC INPUT BUFFER
005C        BASIC INPUT BUFFER POINTER
005E        CURRENT RESULT TYPE (FF) STRING (00) NUMERIC
005F          "      "      "  (80) INTEGER(00)FLOATING POINT
007A-007B   START OF BASIC STATEMENTS
007C-007D   START OF VARIABLE TABLE
007E-007F   END OF VARIABLE TABLE
0080-0081   START OF AVAILABLE SPACE
0082-0083   BOTTOM OF STRINGS (MOVING DOWN)
0084-0085   TOP OF STRINGS (MOVING DOWN)
0086-0087   TOP OF MEMORY ALLOCATED FOR BASIC WORKING AREA
0088-0089   CURRENT PROGRAM LINE NUMBER
008A-0088     "      "      "    "     SAVED BY END
008C-008D     "      "    POINTER SAVED BY END
0092-0093   DATA STATEMENT POINTER
0094-0095   CURRENT VARIABLE SYMBOLS
0096-0097   CURRENT VARIABLE STARTING POINT
00AE-00AF   POINTER ASSOCIATED WITH BASIC BUFF TRANSFER
0080        EXPONENT + 80     )
0081        MANTISSA      MSB )
0082          "                )--(FLOATING POINT ACCUMULATOR)
0083          "                )
0084                      LSB )
0085        SIGN OF MANTISSA (0 IF ZERO)(+ IF POS.)(- IF NEG.)
0088-00C0   DYADIC HOLDING AREA
0002-       START OF ROUTINE FOR FETCHING NEXT BASIC CHARACTER
00C9-00CA   PROGRAM POINTER
  -00D9     END OF CHARACTER FETCH
00E0-       SCREEN POSITION ON LINE
00E1-00E2   POSITION OF LINE START
00E3-00E4   CURRENT TAPE BUFFER POINTER
00E5-00E6   END OF CURRENT PROGRAM
00EA        QUOTE MODE (00 IF NOT IN QUOTE)
00EE        NUMBER OF CHARACTERS IN FILE NAME

00EF        GPIB FILE#
00F0        GPIB COMMAND
00F1        GPIB DEVICE#
00F3-00F4   START OF TAPE BUFFER
00F5        CURRENT SCREEN LINE#
00F6        RUNNING CHECKSUM OF BUFFER
00F7-00F8   POINTER TO PROGRAM DURING VERIFY,LOAD
00F9-00FA   FILENAME STARTING POINTER
00FC        SERIAL WORD
00FD        NUMBER OF BLOCKS REMIATNING TO WRITE
00FE        SERIAL WORD BUFFER
00FF-1FF    BASIC STACK ETC.
0200-0202   CLOCK H.M.S.
0203        MATRIX COORDINATE OF LAST KEY DOWN(255 IF NONE)
0204        SHIFT KEY STATUS (1 IF DOWN)
0205-0206   JIFFY CLOCK
0207        CASSETTE 1 ON SWITCH
0208        CASSETTE 2 ON SWITCH
0209        KEYSWITCH PIA
020B        LOAD 0, VERIFY 1
020C        STATUS
020D        NUMBER OF CHR IN KBD BUFFER
020E-0216   KYBD INPUT BUFFER
0219-021A   HARDWARE INTERRUPT VECTOR
021B-021C   BREAD INTERRUPT VECTOR
0223        KEY IMAGE
0225        CURSOR TIMING
0228        TAPE WRITE
0242-024B   LOGICAL NUMBERS OF OPEN FILES
024C-0255   DEVICE NUMBERS OF OPEN FILES
0256-025F   R/W MODES OF OPEN FILES (COMMAND TABLE)
0262        GPIB TABLE LENGTH
0265        PARITY
0268        POINTER IN FILENAME TRANSFER
026C        SERIAL BIT COUNT
027C        TAPE WRITE COUNTDOWN
0273        LEADER COUNTER
0275        0 IF FIRST HALF BYTE MARKER NOT WRITTEN
0276        0 IF SECOND "    "    "    "    "
0279        CHECKSUM WORKING WORD
027A-0339   BUFFER FOR CASSETTE#1
033A-03F9     "   "    "    #2
0400        START OF BASIC STATEMENTS
  -1FFF     END OF AVAILABLE RAM (8K VERSION)
  -7FFF     END OF AVAILABLE RAM EXPANSION
8000-8FFF   VIDEO RAM
9000-BFFF   AVAILABLE ROM EXPANSION AREA
C000-E0B0   MICROSOFT "8K" BASIC
E085-E27D   SYSTEM SET UP
E294-E66A   VIDEO DRIVER
E66B-E684   INTERRUPT HANDLER
E685-E75B   CLOCK UPDATE,KYBD SCAN(60HZ INT.)
E75C-E7D4   KYBD ENCODING TABLE
E800-EFFF   PIA'S
F086-F226   GPIB HANDLER
F346-F82C   FILE CONTROL
F82D-Fd15   TAPE CONTROL
FD38-FFB2   DIAGNOSTICS
FFC0-FFED   JUMP VECTORS
FFFA-FFFF   6502 INTERRUPT VECTORS
            (NMI NOT USED IN ORIG. VERSIONS)
```

ALL ARTICLES ON THIS PAGE REPRINTED FROM COMMODORE (ENGLAND) NEWSLETTER WITH THEIR PERMISSION!!!

MACHINE CODE ENVIRONMENT

If you wish to write machine code programs in your PET and do not wish to have BASIC trampling all over them here is a suggestion:

When the PET is first powered up a test pattern is written into and read back from the RAM in ascending address order. When this routine discovers a location which does not read back properly it presumes that it has run out of RAM and displays XXXX bytes free. At this point it makes a note of where it thinks the 'top of memory' is.. A quick glance at the memory map will show that BASIC program text is stored from location 1Ø25 upwards and strings are stored from the top of the memory downwards which means that in any normal circumstances there is nowhere in the PET main memory where you can hide your machine code routines.

If however, the first thing you do after powering up the PET is to alter the top of memory pointer to say 6ØØØ everything from 6ØØ1 upwards, as far as PET is concerned, does not exist. e.g. strings will be stored from 6ØØØ downwards etc. and machine code programs can be safely put in location 6ØØ1 upwards. This pointer is held in locations 134 and 135 constituting a 16 bit pointer with 134 being its lower 8 bits. This is a binary pointer which means that we must convert your 6ØØØ or whatever to binary before POKING locations 134 and 135 with the information. In the standard 8K PET 134 will be Ø and 135 will be 32 (32 x 256 = 8192) Remember that 1Ø25 bytes are used for house keeping by the PET (8192 - 1Ø25 = 7167) However to give the PET a ceiling of 6ØØØ we convert 6ØØØ into binary which gives us POKE 134, 112 and POKE 135, 23.

Below we have a way of actually getting our HEX OP-CODES into the PET. Lines 1ØØ-2ØØ read the data statements convert them to decimal and POKE them sequentially into the memory. The first data item is expected to be the starting point of the loading in decimal and the last data item is expected to be an asterix. The beauty of this method is that you can use the screen edit facility on the PET for inserting and deleting codes. When you have inserted your own data statements from line 3ØØ upwards, save the entire performance prior to running as machine language routines rarely work first time around and the PET is quite likely to hang up and need turning off and on.

```
1ØØ READL
11Ø READ A$:C=LEN(A$):IFA$="*"THENEND
12Ø IFC<1ORC>2THEN2ØØ
13Ø A=ASC(A$)-48:B=ASC(RIGHT$(A$,1))-48
14Ø N=B+7*(B>9)-(C=2)*(16*(A+7*(A>9)))
15Ø IFN<ØORN>255THEN2ØØ
16Ø POKEL,N:L=L+1:GOTO11Ø
2ØØ PRINT"BYTE"L"=["A$"] ???":END
3ØØ DATA6ØØØ
   DATA ... continues
   DATA *
```

Line 300 gives the starting location. Here we would use SYS(6400) to jump to this routine.

ABBREVIATING BASIC WORDS

As explained in the instruction manual, any BASIC word takes up 1 byte of memory storage space. It has been stated that the work "PRINT" can be abbreviated to "?" which saves time on entering programs. When listed, the word is expanded to its full form. Both forms take 1 byte per word.

We now have information on how to abbreviate the complete list of BASIC words. The algorithm to remember is as follows:

1. For any BASIC word, type in the first letter of the word (e.g. V for VERIFY).
2. Hold down the 'Shift' key and type in the second letter. If you are in graphics mode, this will appear as a graphic character (e.g. ▭ for E). It is a good idea to go into lower case mode as the two letters are then easy to read.

In some cases, this two-letter method gives a possibility of more than one BASIC word (e.g. READ and RESTORE). For one of the words (usually the longer) it will be necessary to type the first two letters and the shifted third. All these abbreviations are converted to full words upon the command LIST.

Below is a complete list of the words and abbreviations:

BASIC	ABBREV	BASIC	ABBREV	BASIC	ABBREV
LET	Le	DEF	De	RUN	Ru
READ	Re	RETURN	REt	CLR	Cl
PRINT	?	STOP	St	LIST	Li
PRINT#	Pr	STEP	STe	CONT	Co
DATA	Da	INPUT#	In	FRE	Fr
THEN	Th	SGN	Sg	TAB(	Ta
FOR	Fo	ABS	Ab	SPC(	Sp
NEXT	Ne	SQR	Sq	PEEK	Pe
DIM	Di	RND	Rn	POKE	Po
END	En	SIN	Si	USR	Us
GOTO	Go	ATN	At	SYS	Sy
RESTORE	REs	EXP	Ex	WAIT	Wa
GET	Ge	AND	An	LEFT$	LEf
GOSUB	GOs	NOT	No	RIGHT$	Ri
OPEN	Op	VAL	Va	MID$	Mi
CLOSE	CLo	ASC	As	CHR$	Ch
SAVE	Sa	CMD	Cm	STR$	STr
LOAD	Lo	VERIFY	Ve		

INPUT

TAPE HEAD CARE

It has been noted that the READ/WRITE head in the PET cassette deck has the annoying habit of magnetising itself after a remarkably short period of operation. It is in fact possible to partially erase your tapes by up to 15% after only 15 or 2Ø passes over the head. The most convenient way to deal with this problem is to demagnestise the tape head very frequently, ie every couple of days with a demagnetising cassette.

When trying to get the maximum number of characters onto a line of BASIC, it can be frustrating to find that the last character (80th) cannot be entered since the cursor will then move onto the next line. However, it is possible to "push" a character, by inserting, along the line to this end position.

ALL ARTICLES ON THIS PAGE REPRINTED FROM COMMODORE (ENGLAND) NEWSLETTER WITH THEIR PERMISSION!!!

SPECIAL FEATURE : LOW BUDGET PRINTING

Since many users require a print-out purely for recording results of programs and to produce listings, we have been scanning the market for a low cost printer to make known to our users.

One such printer is the SWTPc PR-40 which is available ready made for £250 + VAT. In an attempt to eliminate expensive or time consuming circuits for interfacing this printer, we have developed a subroutine for driving this (or any other 8-bit parallel input output device) from the PET's 8-bit User Port.

The procedure for using this subroutine is neither elegant nor fast, but it is reasonably efficient and easy to use. First, insert the following subroutine (suitably re-numbered if desired) into your program:

```
1010 POKE59459,255:S=32768
1020 POKE59467,PEEK(59467)AND227
1030 POKE59471,13:GOSUB1090
1040 FORN=1TO1000:NEXT
1050 FORA=STOS+39:C=PEEK(A)
1060 IFC<32THENC=C+64:IFS>33767THENEND
1070 POKE59471,C:GOSUB1090
1080 NEXT:S=S+40:GOTO1030
1090 POKE59468,PEEK(59468)AND310R192
1100 POKE59468,PEEK(59468)OR224:RETURN
```

Then proceed as follows:

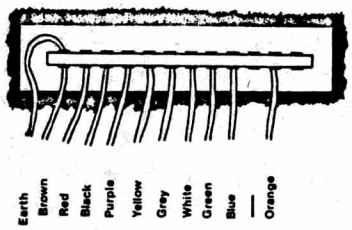
1. Print the desired results or listings onto the screen (a page at a time if too long for one screenfull).
2. GOSUB to the print subroutine.
3. Continue with operation of program or next page of listing/results.

The PR-40 printer takes standard 4" roll paper and will print the standard 64 character ASCII set up to 40 characters wide.

It is currently available on 4 - 5 weeks' delivery and we understand that, if specifically requested, SWTPc will put a PET-type edge connector on their printer to plug straight into the PET. If you require this, please specify PR-40-P on ordering.

For those of you who already have access to a PR-40 or wish to buy one in kit form (£200 + VAT) the following diagram indicates the wiring positions:

8-Bit User Port

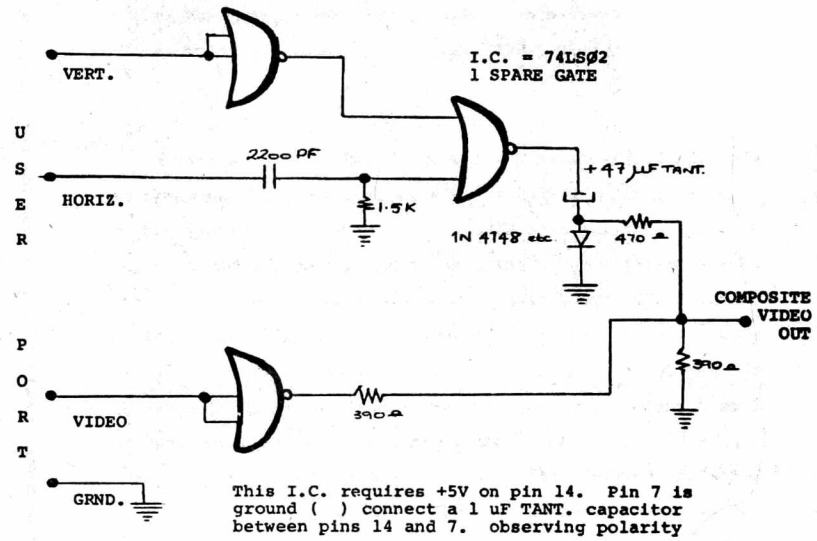


LOOKING AT THE BACK OF THE PET

For an intriguing display of graphics, try running this one line program entitled "BURROW"

```
1 A$="↑↓→←":PRINTMID$(A$,RND(.5)*4+1,1)"*←";:FORT=1TO30:
NEXT:PRINT"■ ←";:GOTO1
```

ATTACHING A VIDEO MONITOR TO PET



This I.C. requires +5V on pin 14. Pin 7 is ground ( ) connect a 1 uF TANT. capacitor between pins 14 and 7. observing polarity

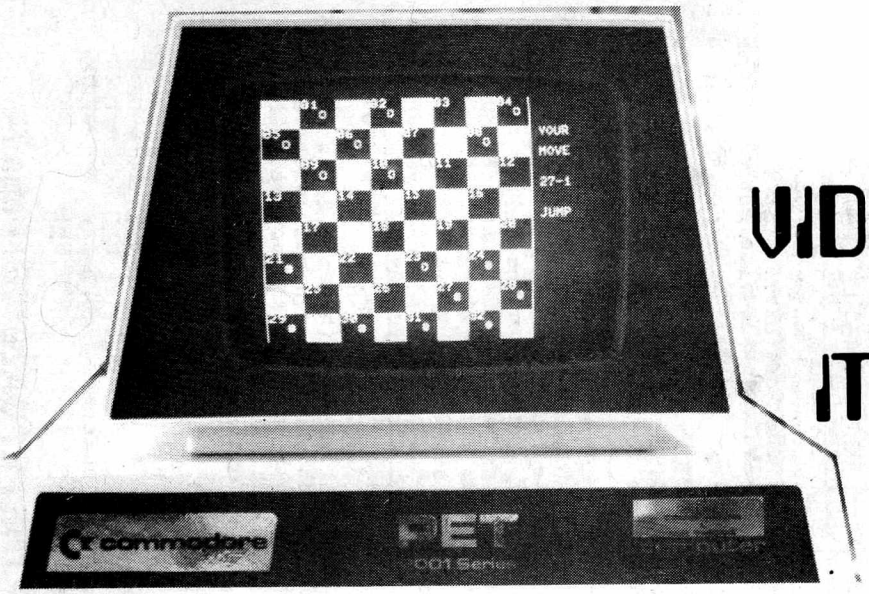
Above is a simple circuit which takes the horizontal drive, vertical drive and video waveforms from the PET User Port and converts them to composite video suitable for driving an RF modulator or a straightforward monitor. The circuit requires a 5 volt power supply and this may be obtained from a 2nd cassette socket which has a few milliamps available at 5 volts. There are no particular points to watch out for when constructing this circuit. Lay-out is not critical. In the unlikely event of the horizontal hold of your display device misbehaving, adjust the value of the 1.5K resistor. This will alter the horizontal sync. pulse width.

PLOTTING

It is possible, with very little effort, to address locations on the screen using simple XY co-ordinates. Below we have a program that uses a simple formula that enables one to do this.

```
READY.

 5 DATA12,15,22,5,12,25,33
 10 PRINT""
 20 PI=3.14159265
 30 FORA=0TO4*PI STEP(4*PI)/39
 40 Y=INT(SIN(A)*12+12):X=X+1
 50 GOSUB80
 60 NEXT
 70 FORA=33568TO33574:READZ:POKEA,Z:NEXT
 75 GOTO75
 80 POKE((24-Y)*40+32768)+X,46:RETURN
READY.
```

The line that does the actual XY co-ordinate conversion is line 80. For the sake of clarity line 80 has been made a sub-routine but the formula is so compact that in some cases, including this one, it is not necessary. Line 5 and 70 should be included when you test this program out but may be omitted subsequently. X has a range of 0-39 and Y has a range of 0-24.



VIDEO CHECKERS

IT'S YOUR MOVE!

NOW AVAILABLE! ---- CHECKERS for the PET
Complete graphics! You play against the computer.
CASSETTE and complete instructions -- $14.95
Plays on any 8K machine.

COMPU-QUOTE 6914 Berquist Avenue . Canoga Park, California 91307

QUALITY SOFTWARE FOR THE PET*

*PET is a product of Commodore Business Machines, Inc.

What does quality software mean? First, it means programs that work the way you'd like them to, easily and naturally. It means internal operating instructions and internal documentation, as well as system design and modular construction to ease modification or maintenance. Finally, quality software is provided on quality tapes (and with MICRO SOFTWARE SYSTEMS, it means a quality, hard plastic case for the cassette!).

SWEE-PING™ a simple but captivating bouncing ball game. The number of ways it can be played is limited only by the imagination of the player. Works in 4k or more. $5.95

METRIC-CALC™ turns an 8k PET* into a powerful stack-operated (RPN) calculator with scientific functions and metric conversions. Provides 20 levels in stack and 20 addressable memories. $7.95

BILLBOARD™ lets the user type in a message (up to 254 characters, including flash, pause), which is then displayed in a repeating loop of one-inch high letters moving across the screen horizontally at a rate set by the user. Free of snow, static. Turns a store-window 8k PET* into an advertising campaign. $49.95

MICRO SOFTWARE SYSTEMS
P.O. BOX 1442, WOODBRIDGE, VA 22193

Send check or money order. Allow two weeks for check to clear. VA residents add 4% tax.
Dealer inquiries invited.

The PET™ Symbol Table and Data Formats©

by Roy Busdiecker

Some exploration through the PET's RAM*, assisted by the MEM-EXPLORER program listed at the end of the article, provided some interesting information on the PET's management of variables. This article reports the results of that exploration, which provides some facts not previously published and corrects some inaccuracies in material which has been published.

There are three pairs of bytes which point into the symbol table. In the typical 6502 fashion, the first byte holds the low-order bits of the address, while the second has the high-order information.

Location (Decimal)	Points to
124,125	Beginning of symbol table (at end of BASIC program), where single-value variables are located.
126,127	Array variable symbols and storage (immediately follows single-value storage area).
128,129	First byte beyond end of symbol table. Beginning of unused storage.

In the single-value variable area, there are three data types: REAL NUMBERS, INTEGERS, and CHARACTERS. The first two types store both the name and value of each variable in this area, in the format shown below. For CHARACTERS, this area contains the name of each variable, the number of characters contained in the string associated with that name, and a pointer to the beginning location where the actual character string is located (at the high end of user memory). All three types require seven bytes in this area, with the specific contents shown below.

REAL NUMBERS

first character in variable name	second character in variable name	binary exponent + 129	first bit of first byte is sign. remaining bits, with all bytes concatenated, give binary mantissa

(Note: articles on real numbers have appeared in The ___ Paper, issues #6, Aug 78, and #4)

* RAM, random access memory ... more properly called read/write memory to differentiate between it and the read-only, or ROM, variety ... incidentally, ROM is also random access.

-continued-

-continued-

INTEGERS

first character in variable name (ASCII values plus 128)	second character in variable name (ASCII values plus 128)	high order byte of binary version of integer value (note sequence!)	low order byte of binary version of integer value (note sequence!)	Ø	Ø	Ø

CHARACTERS

first character in variable name (128 added to 2d character only	second character in variable name (128 added to 2d character only	number of char's in string	low order byte of address where string is stored	high order byte of address where string is stored	Ø	Ø

Array storage also provides for three data types; however, the amount of memory required to hold an array is different for each type. The general form of arrays is shown below.

ARRAY HEADER	ELEMENT (Ø)	ELEMENT (1)	ELEMENT (N)

N stands for the designation of the last element in the array, which depends upon the DIM_( ) statement used to establish the array.

Array headers are very similar regardless of data type, while the elements show great difference from one type to the next. Array headers are in the format shown below.

BYTE	1	2	3	4	5	6	7	8	9
	first character in name of array	second character in name of array	low byte number of memory locations used by array	high byte number of memory locations used by array	number of dimensions in array	high byte number of elements in last-specified dimension of array	low byte number of elements in last-specified dimension of array	optional expansion	optional expansion

The code inserted in the Array Name (bytes 1,2) is coded to show data type. In a REAL NUMBER ARRAY, both characters are unshifted, while an INTEGER ARRAY has both characters shifted (ASCII value +128). A CHARACTER ARRAY header has the first character unshifted and the second shifted.

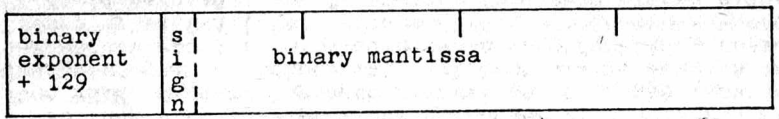
-continued-

-continued-

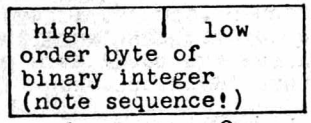
A one-dimensional array, created by a statement like DIM L(N), has a seven-byte header exactly as illustrated. If the array has two dimensions, like DIM L(N,M), then the header will have nine bytes. The value of M would be in bytes 6 and 7, while N would be in 8 and 9. In other words, the dimension information goes into the header "backwards" from the order in the DIM statement. Additional dimensions follow the same pattern. The length of the header, then, is five bytes plus two times the number of dimensions in the array.

The format for each element in an array is shown in the diagrams which follow. Of course, each array can be of only one data type, so all the elements in a single array are identical in format.

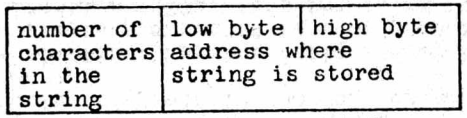
REAL ARRAY ELEMENT



INTEGER ARRAY



CHARACTER ARRAY ELEMENT



Knowing how much storage is required for each representation of a variable, one may make an intelligent decision regarding his choice of forms. Faced with the need to store ten integers when running low on storage space, the user would determine that ten different single-value variables would consume ten times seven, or seventy bytes. A ten-element integer array would require seven bytes for the header plus two bytes per element for a total of only twenty seven bytes. A word of warning is in order: do not overlook the fact that each time N% appears in a program, it consumes two bytes in the program storage area. N%(5) takes five! Perhaps it would be best to buy additional memory (several plug-in units are available) rather than try to optimize storage space!

A few additional facts of interest are noted here. Negative integers are represented in two's complement form (see any basic text on "computer arithmetic"). If array size is not set with a DIM ( ) statement, a default value of ten is assigned, as though a DIM X(10) had been used. Actually, this allows eleven elements to be stored, since the elements are numbered from zero to the DIM size. Memory space not used for program or variables is filled with the "$" character.

The PET BASIC program used in this investigation appears at the end of the article. When it is run, it provides a variety of data on twenty bytes of memory starting at a decimal location specified by the user. In five columns are printed the LOCATION (which byte is being viewed, decimal value), DECIMAL contents of that byte, CHARacter represented by the DECIMAL value, the two-byte ADDRESS value starting at this byte, and a VALUE to interpret integers (see INTEGER format diagrams). A recommended approach, when the program asks LOCATION?, is to specify 120 first, so you can see the contents of the pointers to the symbol table. Then enter those pointer values to see each area in the table.

Variables assigned values in the command mode (without line numbers) may be examined if the program is entered by a GOTO 100 rather than RUN (RUN causes an automatic CLR).

Entire article and program copyright October 1978 by the author, P.O. Box 1442, Woodbridge, VA 22193. Reproduction prohibited without express written authorization from the author.

Submitted to PET GAZETTE for publication.
See program listing following next article.

continued above --

AUTOMATIC LINE NUMBERING PROGRAM by John Mellissa

Just type this program in and then SAVE it on a cassette. The next time you have a long program to write, just load this program in before you start typing in the program. Then run this program to enter the desired program. It will ask for the starting line number and the incremental between line numbers.

```
60000 INPUT "(clr)START #,STEP"; S,T
60100 POKE 828,T: GOTO 60500
60200 S=PEEK(826)*256 + PEEK(827)
60300 T=PEEK(828)
60400 PRINT "(up)                "
60500 PRINT S;
60700 GET D$; IF D$="" THEN 60700
60800 PRINT D$;: IF ASC(D$)<>13 THEN 60700
60900 PRINT "GOTO 60200(up)(up)(up)(up)"
61000 POKE 525,2:POKE 527,13:POKE 528,13
61100 S=S+T
61200 POKE 826,INT(S/256)
61300 POKE 827,S-INT(S/256)*256: END
```

If you have a number of DATA statements to enter, you can increase the usefulness by having it type the word DATA after the line number. Just add this to the above utility program:

```
60600 PRINT "DATA";
```

The above utility could be added to the line deleting utility illustrated in the August - September 78 issue of the PET Gazzette.

The above program uses locations 826, 827, and 828 to store the variables because each time a program line is added, the PET clears all variables stored by the program.

A DECODER ADD-ON TO THE MEM-EXPLORER

by Roy Busdiecker

In the previous article, "The PET Symbol Table and Data Formats", there was a description of a program called MEM-EXPLORER©. That program allows examination of a block of 20 bytes of memory specified by the user. A display is provided, showing the location address, contents in both decimal and character equivalent, and several useful computations.

Since special reserved words used by the PET (e.g., RUN, GOTO, LOG) are stored as single-byte tokens rather than as character strings, the MEM-EXPLORER only provides the character equivalent of the token. One must then go to a table to determine the reserved word it represents.

Except for that shortcoming, it is possible to read a program (vertically, in the CHAR column) from its absolute location in memory, and know precisely where every character is located. If we could decode each token and print the reserved word in its place in the CHAR column, it would be handy indeed!

Fortunately, the designers of the interpreter tucked away the complete expanded form of each instruction in ROM, starting at location 49298. See the TABLE for locations of the expanded forms. The sequence in which the reserved words are stored is identical to the sequence of numerical values for the tokens used to represent them.

Unfortunately, the interpreter prevents PEEK access to the ROM area where the interpreter is stored. The command PRINT CHR$(PEEK(49298)), which ought to print the character "E", actually "prints" a null on the screen (no character or space), incorrectly implying that the address specified contains all zeros in binary.

Fortunately, in a previous encounter with this restriction on the PEEK command, the author developed a simple machine-language program to defeat it. All that was needed was an LDA (load accumulator) from an address in the "forbidden region", followed by an STA (store accumulator) to an address where the PEEK could be used. An RTS (return from subroutine) gives control back to BASIC.

In the program listed at the end of the article, line 1ØØØ sets the pointer for the USR function, and loads the data from line 1Ø2Ø into the buffer area for the second cassette recorder. That data is the machine language routine described above.

-continued-

-continued-

To see how the routine is used, look at line 15Ø of the program. In the previous article, it was

```
15Ø M=PEEK(L)
```

which has now been replaced by

```
15Ø S9=L:GOSUB 2ØØØ:M=S9
```

The subroutine at line 2ØØØ converts the value in S9 to two bytes which are poked into the machine language routine as the address for the LDA (load accumulator) command. The the USR function is called, which places a copy of the contents of the target address in the location 1Ø23. Then setting S9=PEEK(1Ø23) produces the desired value.

Now that the necessary tools are available, we can discuss the problem of turning tokens into their equivalent reserved words. Because of the identical sequences, we can simply subtract 127 from the value of the token to determine whether we need the first, second, or n^{th} reserved word.

If we count the number of characters in each reserved word, and store those values in the same sequence in an array, we can then use that array to create a pointer to the beginning of each reserved word in the ROM. For example, if the token value is 131, then we want to find the 131 - 127, or 4th word in the table. Summing the first 3 values in the array gives 3+3+4=10, which is added to the table starting value of 49298. The next value in the array, 4, tells how many characters need to be taken from the table to complete the expanded form of the word. The four characters starting at location 49308 are D, A, T, A, and DATA is the reserved word that token 131 is used to represent.

STARTING LOCATION	CONTENTS
49298	END
49301	FOR
49304	NEXT
49308	DATA
49312	INPUT#
49318	INPUT
49323	DIM
"	"

Lines 11ØØ - 115Ø create the array A% which holds the lengths of the reserved words.

The pointer (PT) is calculated in lines 183 - 185.

Finally, to complete the example by printing out the expanded form of the reserved word, we add the equivalent of

```
FOR I=1 to A%(4):PRINT CHR$(PEEK(49297+PT+I));:NEXT I
```

except that we must make the previously described substitution

-continued-

-continued-

for the underlined statement in order to PEEK into the "forbidden region". The equivalent code appears in lines 186 - 188 of the program.

Putting all these tools together, and weaving them into the MEM-EXPLORER described previously, yields the new program listed at the end of the article. If you have already typed in the MEM-EXPLORER, load it in the PET, then type in the lines which are new or changed.

When this program is run, it will ask LOCATION? If you answer 1Ø25, then the first 20 bytes of the program will be displayed. The first two bytes contain a LINK ADDRESS pointing to the beginning of the second line of the program. The numerical value of the LINK ADDRESS is shown under the ADDRESS heading, in the first line displayed. The numerical value of the BASIC program line number assigned by the programmer to the first line of his program is contained in the third and fourth bytes (1027, 1028) of that program. It is shown in the third line of the display. Subsequent lines show the actual representation of the BASIC program statements as they are stored in memory, under the CHAR column. A value of Ø signals the end of a line of BASIC code, and always precedes the next LINK ADDRESS byte-pair. A LINK ADDRESS value of Ø indicates the end of a BASIC program.

TABLE

LOCATION Decimal	Hex	CONTENTS
49298	CØ92	ENDFORNEXTDATAINPUT#INPUT
49323	CØAB	DIMREADLETGOTOFUNIFRESTORE
49349	CØC5	GOSUBRETURNREMSTOPONWAIT
49373	CØDD	LOADSAVEVERIFYDEFPOKEPRINT#
49400	CØF8	PRINTCONTLISTCLRCMDSYSOPEN
49426	C112	CLOSEGETNEWTAB(TOFNSPC(THEN
49453	C12D	NOTSTEP+-*/↑ANDOR>=<SGNINT
49479	C147	ABSUSRFREPOSS◻RRNDLOGEXPCOS
49506	C162	SINTANATNPEEKLENSTR$VALASC
49532	C17C	CHR$LEFT$RIGHTMID◻

Point of interest: The author of this article does PET programming for Micro Software Systems, PO Box 1442, Woodbridge, VA 22193. Some of their programs are reviewed in this issue.

-continued-

-continued-

MEM-EXPLORER/DECODER

```
   8Ø  IF E1=1 THEN 11Ø
   9Ø  GOSUB 1ØØØ:GOSUB 11ØØ:E1=1
* 1ØØ  B=256:POKE 595ØØ,14
* 11Ø  INPUT"LOCATION";K
* 12Ø  PRINT"⏬LOCAT'N DECIMAL CHAR ADDRESS VALUE⏬"
* 13Ø  FOR J=Ø TO 19
* 14Ø  L=K+J
  15Ø  S9=L:GOSUB 2ØØØ:M=S9
* 16Ø  PRINT L;
* 17Ø  PRINT TAB(8);M;
  18Ø  PRINT TAB(18);:IF M<32 THEN 195
  181  IF M=34 THEN PRINT CHR$(34);CHR$(2Ø);
  182  IF M<128 OR M>2Ø2 THEN 19Ø
  183  PT=Ø:ID=M-127:FOR I=1 TO ID-1
  184  PT=PT+A%(I)
  185  NEXT I
  186  FOR I=1 TO A%(ID)
  187  S9=49297 + PT+I:GOSUB 2ØØØ:IF S9>127 THEN S9=S9-128
  188  PRINT CHR$(S9);:NEXT I
  189  GOTO 195
* 19Ø  PRINT CHR$(M);
  195  S9=L+1:GOSUB 2ØØØ
  2ØØ  PRINT TAB(25);M+B*S9;
  21Ø  PRINT TAB(32);B*M+S9
* 22Ø  NEXT J
* 23Ø  PRINT
  24Ø  GOTO 8Ø
 1ØØØ  POKE 595ØØ,1:X=Ø:POKE 1,58:POKE 2,3 :A=826:FOR I=A
       TO A+6:READ C:POKE I,C:NEXT I
 1Ø1Ø  RETURN
 1Ø2Ø  DATA 173,Ø,192,141,255,3,96
 11ØØ  DIM A%(75)
 111Ø  FOR I=1 TO 75:READ A%(I):NEXT I
 112Ø  RETURN
 113Ø  DATA 3,3,4,4,6,5,3,4,3,4,3,2,7,5,6,3,4,2,4,4,4,
       6,3,4,6,5,4,4,3,3,3
 114Ø  DATA 4,5,3,3,4,2,2,4,4,3,4,1,1,1,1,1,3,2,1,1,1,
       3,3,3,3,3,3,3,3
 115Ø  DATA 3,3,3,3,3,3,4,3,4,3,3,4,5,6,4
 2ØØØ  D%=S9/256:E=S9-D%*256:POKE 827,E:POKE 828,D%:
       Y=USR(Ø):S9=PEEK(1Ø23):RETURN
```

Note: * marks lines which are unchanged from original MEM-EXPLORER.

Entire article and program copyright October 29,1978 by Roy Busdiecker, Woodbridge, VA 22193.

Submitted to the PET GAZETTE for Publication.

PET HINTS by Jon Staebell

REPLACING INPUT STATEMENTS:

How many times have you demonstrated your PET to your friends and relatives? It's a sure bet you have shown off your PET several times. One of the most bothersome chores is to teach a new comer to always press the RETURN key after he/she has entered something. We "computer people" realize that the RETURN key signifies the end of input to the PET. But that's unnatural to the layman. And many times the naive user will press RETURN by mistake, causing the program to end. Then you have to step in and type "CONT". That mystifies and alienates the new comer. Wouldn't it be nice if the computer wouldn't quit when we just typed RETURN? And wouldn't it be nice if we could control what happens if the user makes a mistake like enter a letter in a numbric INPUT instead of the PET always responding with the cryptic "?REDO FROM START" error message? But how can we put these things under program control?

THE GET STATEMENT:

The form of the GET statement is:

```
GET V$        (V$ is any string variable)
```

I'm sure you've all seen lines in programs like this:

```
10 PRINT"PRESS ANY KEY TO CONTINUE"
20 GET A$:IF A$="" GOTO 20
```

The GET A$ statement will place the character that is being pressed on the keyboard into variable A$. If no key is being pressed A$ will be set to a null string (""). Thus, line 20 GETs A$. If A$="" (i.e., no key pressed) then line 20 will GOTO line 20. If a key is pressed, the program continues. A$ will equal the character that you pressed. Add the following line:

```
30 PRINT A$:GOTO 10
```

Then run the program. Note that if you press the A key, A$ will equal "A". But how do we stop the program?? Presss the STOP key.

Y OR N:

Many times a program will ask a yes or no question (such as "DO YOU WANT INSTRUCTIONS?"). These are sometimes asked via INPUT statements. But then you have to type "YES" (or "Y") followed by the RETURN key to get instructions. But WHY?? Can't we use a GET statement instead? Of course we can! Try this program:

```
 10 PRINT"IS YOUR NAME JON"
 20 GET A$: IF A$="" GOTO 20
 30 IF A$="N" GOTO 100
 40 IF A$="Y" GOTO 200
 50 PRINT"PLEASE ANSWER Y OR N"
 60 GOTO 10
100 PRINT"YOUR NAME ISN'T JON!!!"
110 END
120 PRINT"HELLO JON"
130 END
```

Notice that if the user accidentally presses just RETURN, the program won't die. Even the layperson can understand the error message. (Or simply leave out line 50 and no message will be displayed. But any input besides Y and N will be ignored).

-continued-

BLINKING CURSOR: -continued-

Often times, it is advantageous to have a blinking cursor like the one supplied with the INPUT statement. The idea is this: at the place where theinput is to take place, you simply "blink" a character (called a "cursor"). Thus, the white square that blinks when an INPUT statement is used is a blinking cursor.

NOTE: We will use a character other than the white square as our cursor. Otherwise, the naive user could get confused (when do I have to press RETURN? When don't I have to press RETURN?). In this article, I will use the underscore character (_). You may of course use any character you like, but we suggest you avoid the white square.

```
  5 xx=60:C$="_"
  7 PRINT"WANT DIRECTIONS?";
 10 GET A$:IF A$="" tHEN GOSUB 100:GOTO 10
 20 PRINT A$
 30 IF A$="Y" GOTO 200 (for instructions)
 40 IF A$="N" GOTO 300 (for program)
 50 PRINT"PLEASE ENTER Y OR N"
 60 GOTO 7
100 PRINT C$;                          (= print the cursor)
110 FOR ZZ=1 TO XX:NEXT ZZ            (wait a while)
120 PRINT"cl cl";                      (cl means cursor left key)
125 FOR ZZ=1 TO XX:NEXT ZZ            (wait a while)
130 RETURN
```

Line 5 sets up two important variables: XX and C$. XX times the blinking of the cursor. Thus, the lower XX is, the faster the cursor blinks. C$ is the cursor itself. Here, I use underscore (shift $).

Notice that in line 10, if no key is pressed, we GOSUB 100. Lines 100-130 are the blinking cursor subroutine.

First, the subroutine prints the cursor (C$). Then it does XX null loops. This gives you a chance to see the cursor. Line 120 prints a cursor left, then a space, and then another cursor left. This erases the cursor from the previous position. Then it pauses again (XX null loops) so that the cursor disappears. Thus, the cursor seems to "blink". If a key is not pressed, the process is repeated. When a key is finally pressed, the cursor disappears forever.

The blinking cursor can draw attention to a question and make the program easier to read.

MULTI-CHARACTER GETs

As you probably know, GET can retrieve only one character at a time. But, we can add those characters together to make one long string variable. For example:

```
  5 XX=60:C$="_":E$=CHR$(13)
  7 PRINT"ENTER YOUR SOCIAL SECURITY #";
 10 GET A$:IF A$="" GOSUB 100:GOTO 10
 20 PRINT A$;
 30 IF A$=E$ GOTO 200
 40  B$=B$+A$
 50 GOTO 10
100 PRINT C$;
110 FOR ZZ=1 TO XX:NEXT ZZ
120 PRINT"cl cl";                      (print cursor left, space, cl)
125 FOR ZZ=1 TO XX:NEXT ZZ
130 RETURN
200 PRINT:PRINT"YOUR SOCIAL SECURITY # is:"
210 PRINT B$
```

-continued-

-continued-

The program is basically the same as the last. However, when a key is pressed, it is "added" to variable B$. This then becomes the string of characters entered. However, we need a way of deteding the end of input. That is variable E$. Here, I have used CHR$(13) which is the RETURN key. You may set E$ to anything you want in line number 5.

Th us, the program will keep adding the characters you enter until you press RETURN. Then A$ will equal E$ in line 30, so we GOTO 200. For the sake of simplicity, I just print out B$.

Note that you can change the end of input character by changing variable E$ in line 5. But you still have to enter an end of input character. So what advantage is there? Let's add some things...

Program Control of Input Errors:

For one thing, we know that every Social Security number has exactly 9 digits. No more, no less. Sowhy do we have to check for and end of input? We dont! Make these changes:

```
delete line 30
add line 45
45 IF LEN(B$)=9 GOTO 200
```

Now the program is "smarter" - and you dont have to be. Just type your Social Security number and that's it.

But what if the user includes the hyphens in his Social Security number? What if he just types RETURN? What if he/she accidentally enters a letter? We can check for that! Make these additions to the previous program:

```
12 IF A$="0" OR VAL(A$)>0 GOTO 20
13 PRINT
14 PRINT"ENTER ONLY NUMBERS"
16 IF A$="-" THEN PRINT"YOU DON'T HAVE TO ENTER THE
HYPHENS IN YOUR S.S. #."
18 B$="":GOTO 10
```

Line 12 checks to see if A$ (character just entered) is a number (VAL of a letter is always zero). If it is a letter, the program goes to line 20, which acts as it did in the previous example. Otherwise, there's an error. The program prints "ENTER ONLY NUMBERS". If a hyphen is entered (a common mistake), the program informs the user of his/her mistake. Then, B$ is set to "" and the user is given another chance to enter his/her Social Security number. Better than "?REDO FROM START", eh?

The examples I've shown are just simple examples. You can expand on them and create a truly flexible, easy to use standard subroutine through which you could do all your input. It could deal with errors in a logical, understandable manner. If you'd like to exchange ideas on this or any other topics, please feel free to drop me a note at my new (and permanent) address:

Jon Staebell
5102 Arrowhead Dr.
Monona, WI 53716
(608) 222-4211

TID-BITS by Bill Bendoritis

I've had my "Pet" for a little over three weeks now, and spent alot of time discovering simple things. The purpose of this, what I hope will be a continuing addition to the "Pet Gazette", is going to be geared at helping the absolute beginner with no computer background, like myself, figure somethings out which otherwise might take a long time to discover.

One of the best helps I've had is looking at other peoples software. I was very fortunate in that the day my Pet arrived at the Madison Computer Store was the same day as the Pet user group meeting in Madison. At that meeting I was able to copy programs written by some of the members even though I had nothing to give in return. I want to thank Tim Onasko and Pete Weiler for letting me copy some of their software and especially Len Lindsey who not only gave me some of his programs but a couple hours of his extremely busy schedule to help with some of my problems. In fact it was during that conversation that Len asked if I would write down some of these simple things for the Pet Gazette. These were problems taken for granted by more experienced computer enthusiasts or published long ago by some of the computer magazines. There are those of us who are new to the Pet and computers in general.

As I mentioned before, obtaining someone elses software, boughten or whatever is the biggest help. When I couldn't figure out how to do something I was writting, I would look at the listing of a program that did something similar, to try to figure out how it was done. Just looking at a listing in a book won't do it, you have to see the program running to realize how it works.

It took me weeks to figure out that when turned on, the Pet is always in graphics mode. To get into lower case you have to type POKE 59468,14. To return to graphics without turning it off type POKE 59468,12.

When I would run a program I got errors because occasionally what was intended to be two lines was listed as one. What was happening was now and then the last character of a statement was the last character of the line. After typing it, the cursor would drop to the next line. I just typed a new line number and went on. You can't do that, you must hit return at the end of a statement even if the cursor is where you want it.

In the same vein, when I noticed an error back in a program I would use cursor movements to get to the error, correct it, and use cursor movements to get back to where I was. When I ran the program the error was still there. The cure - after changing a line in anyway, you must hit return for the computer to recognize it.

Another problem of inserting. If you want to insert or change a cursor movement inside a quote you can't just type it in. All that happens is your cursor moves. First you must insert a space by holding down the shift key and typing the INST key. Then fill the space made with the cursor movement.

In trying to copy programs for the Pet out of "People Computers" there were things they did I just couldn't figure out. It turns out that in the past they have set up programming standards that they are using in current issues. A plea to all who print software, please print your standards every issue for all newcomers. The one that really "got me" was using square brackets [ ] to denote that the key is shifted. In other words, hold down the shift and type the key shown. What is listed on the screen might not be what is shown in the magazine although it is the correct character.

Mike Louder
1148 Thompson Ave. 4, Glendale, Cal. 91201
213/246.0505

*** Dynamic Keyboard ***

Would you like to add GOTO (expression) or GOSUB (expression) to your next BASIC program ? How about being able to add change or delete BASIC statement lines while a program is running ? Variations of a single fundamental procedure provide endless possibilities. The technique could be called programmable keyboard.

The decimal addresses for the keyboard buffer are 527 through 536.

The buffer counter address is 525.

If a BASIC program is interrupted with a STOP or END the keyboard moniter searches the keyboard buffer and executes any "ASCII" instruction that may have been typed in while the program was running. By using BASIC to "POKE" the buffer and appropriately interrupting the run mode, GOTO (expression) is easily implemented. Adding new "line's to your program is a more involved process with a few known disadvantages :

(1) Resident screen graphics will be interfered with.

(2) Changing BASIC "line's" will un-link and reset the variables list to zero.

(3) Subroutine pointers are lost.

If the routine is not used to change your BASIC code, only (1) above applies.

Try this GOTO (expression) demo.

```
10 X = 10
20 L = X*10 : GOTO 50000
100 X = X+10
400 X = X+10
600 X = X+10 : GOTO 20
700 PRINT " THE PET HAS A DYNAMIC KEYBOARD " : END

50000 PRINT "(CLR) (DOWN) (DOWN)" : PRINT "GOTO" L : POKE 525,1 : POKE 527,13 :
      PRINT "(HOME)" : END
```

REM : Clear screen and position GOTO L so that cursor is located on the left after PRINT "(HOME)" and exiting BASIC with END. "Load" buffer with a count of 1 and a 13 code which represents the same action as pressing the RETURN key.

A simple example using "L = (expression) : GOSUB 50000 ":

```
10 INPUT AREA CODE
20 L = AREA CODE*10 : GOSUB 50000
30 END
6060 PRINT " KENTUCKY "
6061 PRINT " ASHLAND,BUTLER,COVINGTON & LEXINGTON " : RETURN
```

ETC.

The following utility routine is self explanatory. Call with a GOTO or RUN 60000.

-continued-

-continued-

```
60000 PRINT "(CLR) DELETE LINE NUMBERS FROM J TO K : 'J,K'
60005 PRINT
60010 PRINT " REM J & K ARE INTEGERS FROM 0 TO 65535.
60015 PRINT
60020 INPUT J,K
60030 KI = INT (K/256) : POKE 826, KI : POKE 827, K - KI*256 : GOTO 60050
60040 J = PEEK (828) * 256 + PEEK (829)
60050 PRINT "(CLR) (DOWN) (DOWN)"
60060 K = PEEK (826) * 256 + PEEK (827)
60070 FOR I = J TO J+8 : IF I > K THEN 60120
60080 PRINT I
60090 NEXT
60100 PRINT "GOTO 60040"
60110 J = J+9 : JI = INT (J/256) : POKE 828, JI : POKE 829, J - JI * 256
60120 POKE 525, 10 : FOR N = 0 TO 9 : POKE 527+N, 13 : NEXT
60130 PRINT "(HOME)" : END
```

60030 REM : Since K and J will be set to zero during the line deleting routine, K and J will be saved in a "safe" memory location outside of the "BASIC operating system".
The 198 byte second cassette buffer is safe if not in use.
Buffer address is :
Hex 033A through 03FF.
Decimal 826 through 1023.
J and K are stored as integers in the base 256 number system.

60040 REM : Recall updated J (see 60110).

60050 REM : Clear screen and position each group of 9 consecutive line numbers so that the cursor is in front of the top number after exiting BASIC at line 60130

60060 REM : Recall K.

60070 REM : Generate consecutive line numbers until I > K.

60100 REM : 10 th item on list. Leave keyboard monitor and return to BASIC.

60110 REM : Update and save J prior to leaving BASIC.

60120 REM : "Load" keyboard counter with a maximum count of 10 and fill the buffer with the ASCII code which represents the same action as pressing the RETURN key (13).

60130 REM : Position cursor at HOME then exit basic and execute 10 consecutive RETURNs then return to BASIC via line 60100.

Change line 60080 to :

```
60080 PRINT I; "?"; CHR$ (34) CHR$ (34) CHR$ (20); "THE PET HAS A DYNAMIC
      KEYBOARD.
```

And add : 510 END
Watch the action after : RUN 60000, K,J = 400, 500; Then : RUN 400.

-continued-

-continued-

Mike Richter provided the CHR$ ( ) combo which supplies the otherwise missing quotation mark.

Changing 60080 back to "PRINT I" will allow you to delete lines 400 through 510.

As an example of generating new DATA lines as the result of a complex search-compare operation or involved math routine :

```
60050 PRINT "(CLR) (DOWN) (DOWN)"
60070 FOR I = J TO J+8
60080 PRINT I; "DATA"; 2↑I;." , " ; I↑2
60090 NEXT
60100 PRINT "GOTO" L
60120 POKE 525, 10 : FOR N = 0 TO 9 : POKE 527+N, 13 : NEXT
60130 PRINT "(HOME)" : END
```

Program :

```
10 J=1 : K=9 : L=20 : GOTO 60050
20 J=10 : K=18 : L=30 : GOTO 60050
30 PRINT "THATS ALL FOLKS.
40 END
```

Using a technique similar to above, the PET "typed in" a large additional DATA table for the Joseph Roehrig 3 - D TIC-- TAC - TOE game. (Kilobaud Apr 77). Now it takes only 24 seconds to make the first move.

I would like to hear about other Dynamic Keyboard applications.

Useful programming aids :
(1) Pet User Notes : vol. 1 #3 (Mar - Apr 78) : page 9 : CHR$ character codes.
(2) Pet User's Group Newsletter (Sphinx) vol. 0 #1 page 8 : Pet memory map.

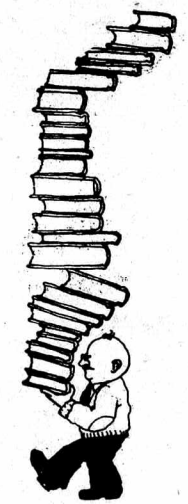
Notes : Fundamental idea came from previous SR-52 relocating code programs submitted to HP-65 User Club and the line adding routine illustrated in the Peninsula School "DRAW 8K" (People's Computers Mar/Apr 78) program lines 7000 through 7040.
POKE address information was originally provided by Lennie Cooper and Leonard Tramiel of Commodore. Their fast response to my questions is greatly appreciated.
Finally, Mike Richter helped debug the procedure and pointed out how my first effort, which placed the GOTO L in the keyboard buffer, wasn't necessary. Mike has always provided programming tips when I needed it (which is often) .

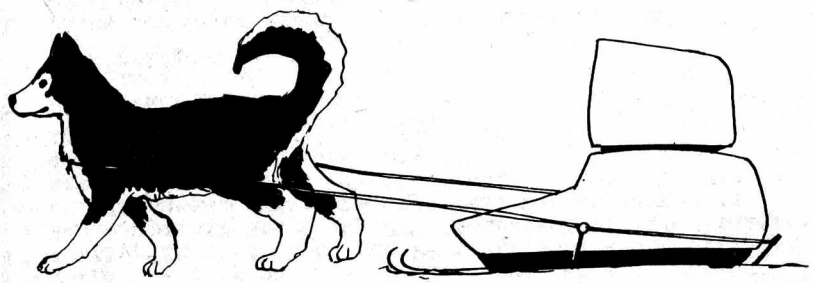
CASSETTE PROTECT

After you record a program on your cassette you can protect it from accidentaly being erased. Puch out the small tab on the top left side as you look at the side you want to save.

To be able to record on that side again you will have to do one of two things.
1) Put a piece of tape over the small hole.
2) Open the door to the cassette player. Note that on the left side back inside there is a small (black) peg. If your cassette has the tab on it yet, the tab will push this little peg back and the record button will be operational. You can stick your finger (or pencil) down and push it in your self and press the Record key and then put in your tape. Then hold the record key down as you press play.

```
100 REM   "CASE CONVERTER"
120 REM   "By Pete Weiler"
130 REM
140 REM"This program converts upper case"
150 REM"letters within quotes to lower case."
160 REM"This helps make your program's display"
170 REM"more readable."
180 REM
200 REM" 1. If you want lower case in only a"
220 REM"    part of your program reset L1 & L2"
240 REM"    in line 62000. Set L1 & L2 to the"
260 REM"    first and last line numbers of the"
280 REM"    part you want converted."
300 REM" 2. Clear the screen and list lines"
310 REM"    62000-6260."
320 REM" 3. Load your program."
340 REM" 4. Add lines 62000 through 62600 to"
360 REM"    your program by moving the cursor"
380 REM"    to the beginning of each line and"
400 REM"    pressing return."
420 REM" 5. Type in  RUN 62000 , press return"
440 REM"    and wait till the program finishes"
450 REM"    running."
460 REM" 6. Remove lines 62000 through 62600"
470 REM"    from the program."
520 REM" 7. Go through the converted lines and"
540 REM"    change back to upper case any"
560 REM"    letters you want to be capitals."
580 REM"    Watch carefully for such things as"
600 REM"    the "y" which must be changed back"
620 REM"    to "Y" because it is used to check"
640 REM"    for a yes answer to a question."
660 REM" 8. Insert a POKE 59468,14 at the"
680 REM"    beginning of the section containing"
700 REM"    lower case letters. If necessary"
720 REM"    insert a POKE 59468,12 where you"
740 REM"    want to switch back to graphic"
760 REM"    characters."
62000 L1=1: L2=61999: I=1025: POKE 59468,14
62100 I2=PEEK(I)+256*PEEK(I+1)-2:L=PEEK(I+2)+256*PEEK(I+3)
62200 IF L>L1 THEN I=I2+2:GOTO 62100
62300 I1=I+4 :Q=1 :IF L>L2 OR I2<0 THEN END
62400 FOR I=I1 TO I2: A=PEEK(I): IF A=34 THEN Q=-Q: GOTO 62600
62500 IF Q<0 AND A>64 AND A<91 THEN POKEI,A+128
62600 NEXTI: I=I2+2: GOTO 62100:
```





AT LAST.....

ARESCO
P.O. Box 43
Audubon, PA 19407

A PET™ TUTOR

PET is a Trademark of Commodore Business Machines

EVERY BEGINNING PET USER SHOULD HAVE THIS!

The package consists of 20 interactive lessons on two C-45 cassette tapes, containing nearly 400 full screens of vital information. All the major BASIC keywords, screen editing, and the PET control functions are explained in clear, easy-to-follow lessons, with examples, problems, and fun! A real bargain at $19.95.

PET BASIC COMPLEAT, the 170+ page manual which complements the tutorial, is indexed for easy reference and review. It comes punched with standard 3-ring binder holes, held together with brass brads. Each screenful of information contained in the tape tutorial is faithfully reproduced! You can't afford to miss this at $29.95.

The manual and tape together have proven to be the most effective learning tool available for the truly beginning PET owner and user. Buy both for $39.95 and save almost $10.00!

PLEASE R·U·S·H

I ENCLOSE FULL PAYMENT ○ ○CHARGE MY CREDIT CD

MC/VISA/BAC _____ EXP _____ MC bank no. _____

NAME _____ STREET _____

CITY _____ STATE _____ ZIP _____

THE PAPER

P. O. BOX 43

AUDUBON, PA. 19407

REVIEW Workbooks, $3 to $5 each.

TOTAL INFORMATION SERVICES (TIS) -- PET WORKBOOKS

We have a copy of each of the 5 available workbooks: Getting Started with Your PET; PET String and Array Handling; PET Graphics; PET Cassette I/O; Miscellaneous PET Features. They are excellent workbooks and we are very impressed. We recommend any new PET User to get a couple of them at least.

The workbooks not only explain in a clear, easy to understand manner, what is going on in your PET, but also include program listings to demonstrate each item being discussed.

These workbooks save a PET User hours of needless work trying to decipher their PET's behavior. With the relative lack of information about the PET now available, these workbooks fill a real need.

The workbooks do not try to teach BASIC, but rather try to teach the User how to use his PET. Special functions are explained and particular features pointed out, such as various PEEK and POKE locations.

REVIEW 5 programs, $17 - $20 each.

COMPUTERS ONE -- THE HUSTLERS: General Ledger, Checking Account, Rent Accounts, Legal Diary, Trust Accounts

These 5 business programs are similar in nature. We will only review General Ledger this month so as not to repeat ourselves. Next month will be part 2. Along with the program on cassette comes a printed instruction booklet and 2 blank tapes.

All entries must be entered as DATA lines, not on a DATA tape. Data entered becomes part of the program. Thus the amount of DATA that can be stored is limited by the memory size. DATA is entered giving the account number, date, check number, amount, and comments. The program will sort by account number and total amounts in the account. It does not however list the entries in the account in date order or check order. It lists them in the order that they were entered. Comments are limited to 16 characters. Amounts are lined up by the decimal point. However if you enter some dates as 914 (Sept 14) and 1230 (for Dec 30) then the difference from 3 digit date to 4 digit date offsets the check number colun by one space.

Possible benefits from using DATA statements are:
Simple operation *easy error correction*
ability to list and SEE the DATA

Instructions for the use of these programs are very complete and quite clear. The program itself is not documented. After performing the task assigned to it, the program ends. You must retype R U N to try another task. This is somewhat bothersome.

TAPE TIPS by A. BARSAMIAN

Here are some tips to help PET users avoid headaches in saving/loading programs on cassettes:

1. Use only brand-name LOW-NOISE, HIGH OUTPUT music tapes (not Cr O_2!) such as MEMOREX MRX_2 or MRX_3, and TDK D-C60. Their output is about twice that of a regular cassette, and this high signal to noise ratio insures almost 100% reliability (well 99.5%!!). The cost varies between 99¢ and $2.50 for a C-60 (NYC area).

2. Use only C15-C30 or C60 cassettes. Longer playing cassettes have thinner tape which causes "print-through" and almost guarantees errors. I had always had load errors with SCOTCH Highlander C-90!

3. Keep your cassettes in a STEEL index card file box, with the lid closed, away from heat, air conditioner (motor), loudspeakers (magnets), transformers and TV sets (radiated Horizontal Scan frequency causes print-through like a tape duplicating machine!). Minimum distance for above ≈2 ft.

4. If you have load errors on a hot-humid day and no air-conditioning (using el-chlapo cassettes!!), put the cassette in a plastic sandwich bag and then store in a refrigerator for 1 hour (not freezer!) After that, it usually is possible to load from that cassette (might require 2-3 tries!). Save the program on a high-quality cassette as in (1) above. THROW-AWAY the offending cassette or you'll be tempted to re-use it....with the same problems....or worse! I had experienced this problem with canned software tapes from Computer Factory....one gets mad as hell if you pay $10-$16 and it doesn't work....

5. Use Q-tips and rubbing alcohol to clean-up the tape heads once a week (takes 1 minute!!).

6. Demagnetize the tape heads every two weeks! It is well worth spending $6-$10 on demagnetizer (from Radio Shack or Lafayette Radio) if you want your program tapes to last 40-100 'plays' without load errors! Make sure you don't have cassettes laying around in the open when you do it!

7. Always have 2 copies made of any program you save (on different cassettes, of course!) for backup purposes.

8. Always push the cassette knockout tabs in with a ball point pen to prevent accidental erasures. To record new material, just place a piece of scotch tape over it.

9. NEVER-NEVER touch the tape in the cassette with your fingers! Grease film will mess up your precious recording.

To copy tapes WITHOUT a PET:

1. Get 2 cassette recorders; one of them MUST be a MONO recorder, preferably with automatic level control (ALC), and AC erase instead of a magnet.

2. The Master cassette recorder holds the original tape to be copied, and it can be any reasonable quality ($40 & up) MONO/STEREO recorder. The Slave recorder holds the new virgin tape (the copy!) and it MUST BE A MONO recorder to give you a full half track recording width on the tape. If you attempt to use a stereo recorder for the Slave (as I did initially!) the 1/4 track recording output played back on the PET is not high enough to load properly.

-continued-

3. Use or make patch cords (available from Radio Shack) to connect the Master high-level output (or speaker output - 2nd choice!) to slave high-level input.

4. Use play/record controls as specified by recorder manufacturer. If you don't have ALC on the slave, you'll have to experiment with the volume and tone control settings on both Master and Slave (A scope will help). Write down the knob settings for future reference on masking tape and affix it to the back of the recorders.

To locate quickly a program out of many on one cassette you can try the following:

1. Load the program in front of the program you want.
2. Rewind the tape and time it with wristwatch the time required to go to beginning of tape.
3. Write on cassette label the time and FF in parenthesis after file name.
4. Next time you want to load the program, make sure the tape is completely rewound, and then fast forward for the amount of seconds you have written down.

NOTE: Fast forward and rewind speeds could be very different, but you can time them on your machine and calculate the ratio by which you have to adjust your search time....and all this for lack of a 99¢ counter!!!

TAPE TIPS by DENNIS CUMBERTON

Tangling with the good, the bad, and the ugly is obviously the lot of any dedicated PET hobyist. One of the more frustrating tasks has been the search for a reasonable high quality C-10 Cassette. I had already ordered some from Pyramid Data before I saw the Gazette review of them. I rate them unsatisfactory. I have also tried some C-10 AGfa tapes from AB Computers. They are no better. Now, Pyramid guarantees their Tapes, and I would suspect that AB Computers would do the same. {AB Computers is perhaps the most fantastic mail-order people I've dealt with--I just had an order return in 8 days, and that was over Labor Day weekend} My point is that these firms should be aware that their product is not PET-compatible and should not market them to PET users. Be that as it may...I advocate the following.

Go to a Radio Shack. Buy three C-30 Green Label "Concertape" Cassette tapes in a pack for $1.99. Buy a splicer for under $3. Record any length of program or programs you desire. Press play for about 15 seconds to be certain you have adequate leader at the end inccase you desire to use the other side too. Cut, pull what you don't want off the end of the cassette, and splice the ends together. I have over a dozen in use at the moment and have experienced absolutely no problems. by DENNIS CUMBERTON

LOADING TAPES FROM OTHER SOURCES THAN YOUR OWN PET COMPUTER

You will have a much better chance of an accurate load if you type L O A D (RETURN) rather than (SHIFT) (RUN).

Once you get it correctly loaded save it on another tape. A recording made by your own machine will be much easier to use. Save it before you type R U N. After you have saved the program on your own tape, type R U N (RETURN) and make sure that it was correctly loaded.

If you get a LOAD ERROR try loading it again. First clean your tape heads AND demagnatize them.

LOAD errors are probably caused by high speed duplication or poor head alighment.

R E V I E W - STARTREK3 - $10 - DR. DALEY

A very good version of the standard Startrek, world famous computer game. This is a real time version (seems to be a specialty of Dr. Daley) It includes a small instruction booklet, listing all the commands and what they do, along with course explanations etc. Very good for your first try at startrek, and very good for the Startrek Freaks for it includes all the standards, plus an experimental ray (who knows what it can do). You are commander of the Enterprise and you must destroy all the Klingons in the Universe before they take over and obliterate the Federation. This strategy game is very addictive.

You can control your Warp Engines, Short Range Sensors, Long Range Sensors, Phasers, Photon Torpedoes, Library Computer on board your ship which gives you Damage reports, Torpedoe course data, and a Galactic map. You also control your protective Shields. The added bonus is the Experimental Ray.

Startrek2 has sound effects and Startrek4 will have antimatter pods. Every computer should have a Startrek.

R E V I E W - STARTREK - $7.95 - SMITH BUSINESS SERVICES

Another good version of the all time classic computer game Startrek. This version uses all the standard controls. It is not real time, and allows you as much time as you wish to figure out your next move. You can choose how hard the game will be (chose 1 for novice and 10 for extremely difficult). The above review gives a good overview of the game. This version of Startrek does use a special Course Headings number arrangement. Course headings vary from 0 (up) to 100 (right) around to 399.99 (just a hair to the left of up). Most other versions use 1 (right), 3 (up) around to 8.9999 for just a hair below right. It probably is a matter of personal preference as to which method will be easier for you. This version does not have an experimental ray or on board computer.

As said once before, every computer should have a Startrek.

REVIEW - STAR TREK - DAD'S RELIABLE SOFTWARE $12.95

At last, there is a new Star Trek game. While it is still based on the old "Kill the evil Klingons" theme, it does include some new inovations. For instance, you no longer have an 8 by 8 grid to worry about - the enterprise actually moves overthe entire screen, as do torpedoes. Also, you don't simply enter your "warp" factor and move so many quadrants instantaneously.... no, once you start moving you keep moving until you either apply reverse thrust (remember physics?), apply the emergency braking feature, or enter "hyper space" - the results of going too fast (presumeably the speed of light). The best part of this game, the one thing that seperates it from all the other Star Trek games is the fact that it is not easy to win! In fact, it is extremely difficult. Whereas other Star Trek games are boringly simple, this one could take a long, long time to master. A must for any serious Star Trek fan.

review by Jon Staebell

R E V I E W - CHASE - $7.50 - DR DALEY

A very good version of the well known game of Chase. It is a real time version. You can choose the robot intelligence level (excellent extra) 5 robots chase you around a high voltage maze. If the robots hit an energized post they are destroyed. However, if you hit the post you are zapped. You must survive running around the maze until all the robots have destroyed themselves. A real fun game.

REVIEW-STARTREK-$5.95-PET SHACK

A couple pages of written instructions and a course plotting chart are included with this version of Star Trek. This version is different than others in that it requires a data tape to be able to run. They also include a short program that will make a duplicate copy of the data tape for backup purposes. The game is the standard version, with directions of 1-right, 3-up, 5-left, 7-down, and any numbers or fractions in between accepted. Although the command is only 1 digit, they do not use a GET command - so you must hit return too. If you enter alphabetics instead of a number you get the cryptic REDO FROM START message. There is a minor bug in the display of years left to go. You start with 100, but after 1 year (1 turn) it is updated to 990 - the final 0 of 100 is not erased first. It surprised me when I looked after a few moves and found I had 970 years to go. This is corrected once the screen is cleared and a new display is printed. All standard Startrek options are available for your command. This seems to be the cheapest commercial version.

REVIEW

ZZYP DATA PROCESSING -- IRON PLANET - $10.00 with HANGMAN

You must rescue the Princess before the Dark Lord reaches you and cuts you to smithereens. At the very beginning of the game you are allowed to see the floor plan, showing where you, the Dark Lord, and the Princess are as well as where the walls (bulkheads) are. This layout is then erased and you must procede for the rest of the game aided only by your memory and reports by your robot about the distance between you and the princess and also the distance the Dark Lord has to go to get to you.

You can either move one square or shoot. You can shoot your way through the walls (if you are lucky) or if you shoot the Dark Lord, he runs away and hides behind the nearest wall.

The booklet provided with the cassette tells you how you can modify this novel and interesting game to increase your dificulty or change distances and names used. Good game to test your memory.

REVIEW-ZZZAPPP-$7.95 -Dr. Daley

reviwe by Jon Staebell

ZZZAPPP! is a slightly amusing no skill "game" which is based on no known real-life game. The object of the game is to launch little arrows at a bouncing ball in hopes that the little arrows will hit the little ball. Oh joy. The ball starts out moving very fast and slowly lessens in speed until you finally hit it. Then, you are told how many seconds it took you to accomplish your feat and how many arrows you had to launch. One good point is that it keeps track of this information if you play multiple games. When you end the game, the program gives you your averages.

Another thing I like about this program is that it does make use of the PET's ability for graphics and animation (if you care to call floating arrows animation). It's a start anyway. Soon, DR. DALEY may devote his talents (which are obviously plentiful; the program is not an easy one to write) to more interesting programs. ZZZAPPP is an interesting game for the first three minutes of play. And some people might want to have a copy.

REVIEW short length data tapes

MICROSETTE CO. -- DATA TAPES

After using your PET for only a short while you will realize that a 5 minute per side cassette tape will be plenty long for storing programs and data. Using a C-30 tape usually just wastes alot of tape and time rewinding if both sides are used.

Our search for short length tapes lead us to MICROSETTE CO. Thus far the tapes have worked well, but we are displeased with the company.

We noticed their announcement in Peoples Computers. We immediately wrote to them for specific ordering info. After no response in a couple weeks we decided to order 100 tapes using the info in their announcement because we needed the tapes right away for our PET CASSETTE EXCHANGE.

They only shipped us 99 tapes (we counted carefully 3 times). They raised the price of the tapes on us. We had sent our complete payment along with the order to receive a 10% cash discount. They shipped them COD to us because of the increase in price. Thus we had to pay shipping and also COD charges. The effective cost increase to us was about 35%. We wrote to them and asked for an explanation. 3 weeks later we received a reply. They said that"what is done is done" and we could not get any refund. Note that they also advertise a "FREE" sample tape, then ask you to send $1.00 to cover expenses.

Comments on MICROSETTE.

Please note our reviews reprinted on this page. We received several letters with comments about Microsette. Microsette wrote to us concerned about these reviews. We don't want to turn into a gossip magazine so we won't print all the letters, but do consider it important to print a summary of the comments. Microsette said about the price raise quote, 'An announcement (it was not an ad) in any magazine cannot be taken as gospel....all companies reserve the right to change their prices, and we are no exception.' Concerning the shipping charges they said that we didn't prepay the shipping charges so quote'you would have had to pay C.O.D. charges for the shipping charges anyway'. We count every penny and can't afford to pay COD charges in ADDITION to shipping - that is why we prepaid the order. They were surprised that the cassettes arrived badly damaged. I don't see why! The packaging was VERY poorly done. The cassettes were loose inside the box with a few sheets of foam only on the top. NO protection on the other 5 sides.

Several people wrote to say that they had good experience with Microsette. Several did not. Some of our Microsette tapes started making funny noises. Then many of our programs seemed to fade away. And we demagnetize our tape heads! Another person had problems with programs fading away. We have transfered programs on Microsette tape to AGFA tapes. One letter from E.R. said quote, 'Microsette tapes: I purchased 10 of the 10 minute tapes. Despite the fact that one registers that strange noise that you mentioned and another is twisted all have performed satisfactorily.' Another set of two letters from R.L.S. we are reprinting on this page.

REVIEW - MICROSETTE CO., C-10 Cassette tapes.

"Free" sample costs $1, Package of 10 costs $7.50 for C-10 tapes. They do not accept phone orders and thus do not give out their phone number.

Last issue we reviewed them and mentioned how they raised the price on us and even though we prepaid to get a discount and avoid shipping it COD they sent it COD and charged us EXTRA!! We of course contacted them on this. They apologized. No refund, nothing. We unfortuneately did not know of another good source for C-10 tapes so we ordered 100 more. These arived VERY POORLY packaged. MANY of the plastic boxes were broken and cracked. Several were completely shattered, thus small pieces of plastic were all over the inside of the box. We must admit that the tapes are EXCELLENT, the best we have seen at such a low price. But the company leaves something to be desired in customer relations, deceptive advertising(raising the price imediately following their ad), and poor packaging.

2 LETTERS

- Thank goodness you had the review on Microsette. I had just received their "invoice", all doctored up, with the price changed from 48¢ to 58¢. (And the quantity dropped from 100 to 83!) No price list, no explanation, just the invoice. I spent a day debating what to do when your Gazette arrived. I promptly returned the invoice marked "REFUSED" and when the package arrived 3 days later, we refused that also. Will order tapes from Doc Daley. Will let you know how much difficulty I encounter getting back my $48.

The status of Microsette: when they got around to responding to my refusal of their product at the new price - they "refunded my $48 in full - less a $10 restocking charge."

I haven't cashed the $38 check yet. Instead, I've turned it over to the collection company for action. Perhaps a little harassment will get some action. They have a most unprofessional manner of doing business.

REVIEW - PYRAMID DATA, C-10 Cassette tapes.

Package of 5 C-10 tapes are $3.30. Without boxes, includes 10 blank labels. 5 C-20 tapes are $3.60.

They use Scotch brand, 3M #284 audio tape. They have a nice leader (good) but no screws (Of little importance unless you plan to open it up). In the past we had bad experience with Scotch brand tapes. We received 5 sample tapes. They proved to be not very reliable. We had load errors with one, another didn't even find the file name. We had just cleaned our tape heads and demagnatized them, and the tapes were recorded on the same machine.

REVIEW - FULL COMPASS, C-10 Cassette Tapes.

Located in Madison at 55 Dickinson (in the Washington Square office building) 1 C-10 tape for $1.49. 10¢ discount with 10 or more.

These are premium tapes. Screw type shells and excellent tape, Agfa, from Germany. No problems with these thus far. Superior tapes.

T I S
WORKBOOKS
Order Yours Today!

T I S

WORKBOOKS FOR THE COMMODORE PET 2001

Getting Started with Your PET WB-1 $4.00

Covers the fundamentals of PET BASIC: calculator and program mode, data input and output, data representation, program storage on the cassette.

PET String and Array Handling WB-2 $3.95

Covers string and substring search, concatenation, replacement and manipulation.

PET Graphics WB-3 $4.95

Covers use of cursor control and special graphics symbols to draw plots, histograms, and sketches.

PET Cassette I/O WB-4 $4.95

Covers OPEN, CLOSE, string and numeric data files.

Miscellaneous PET Features WB-5 $3.95

Covers the clock, random number generator, upper and lowercase alphabetic characters, saving memory space, etc.

Don't be "lion" around! Order NOW! Send check or money order today to:

TIS
P.O. Box 921
Los Alamos, N.M. 87544

Money back guarantee.

REVIEW - MEDIT - TOTAL INFORMATION SERVICES (TIS) - $5.95(+$3.95 for the cassette)

This is a line oriented text editor which allows you to insert and to modify or delete. It does not have provisions for output to a printer, but will save and read files to and from cassette.

It is hard to use because every line of input must start with an "I". If you forget to type in the I first, it will give you anerror message. TIS has informed us that they are working on an improved version which will not need the "I" as the first character in an input line.

Every line starts with some command. You can move up and down any number of lines you wish, and display any number of lines currently in your file.

This is a very inexpensive Text Editor.

* The IMPROVED version in now finished. You no longer have to type an"I" as the first letter in the line. Other things were also improved. Congratulations.

REVIEW-BUDGET-$14.95-PETSHACK-PO Box 966, Mishawaka, IN 46544

This is one of the best budget programs I have seen for keeping track of your personal finances. It uses data tapes for storing your data. This is very handy. Each time you wish to update your records you load in the program and then read in your last data tape. It tells you which checks are outstanding from last time as well as how much was spent in each budget category.

With this program you can set up and change a budget, keep track of "accounts" as paid by checks or cash. If by check, the program automatically updates your check data to include that check to be accounted for. It will also sort your checks for you and list your outstanding checks in check number order. I am tempted to use it for myself.

ZZYP DATA PROCESSING -- HANGMAN

This is the traditional game where the computer thinks of a word and you try to guess it before you are hung (by guessing the wrong letter too many times)

The PET choses a word at random from the list of words supplied as DATA at the end of the program. You may wish to change this list of words and the booklet that comes with the tape tells you how to do this. For more flexibility, you may wish to modify the program to accept a data tape for its list of possible words.

The game is presented very well. It shows where your correct letters go in the mystery word and displays your incorrect guesses on top of the screen. It won't let you guess the same letter twice. If you lose it choses another word for you to try. You can guess the whole word if you think you know it, and if you are wrong it won't be counted against you.

REVIEW-FULL SIZED KEYBOARD-$175-EXCEL CO.

We just received this keyboard. It plugs into the keyboard connector inside your PET. The PET keyboard then plugs into it, thus hooked in parallel you may use either keyboard. It appears that the keyboard is ASCII encoded and translates PET signals. It works like a typewriter in that you must shift for UPPER case. This is good unless you are using a program (such as Connecticut Microcomputer's Word Processor Program) which converts the keyboard with software. There is a problem then since each key is converted both by the program and by the keyboard. The result is no conversion, they cancel each other out. Cursor and special key functions are available, but with some effort. You must use a control function key plus another, similar to shifting. You must learn which keys control what. There is a repeat key that works in combination with any other keys. This is VERY NICE !!! You can even repeat the INSERT key to insert alot of spaces quickly. Or delete alot fast. The lack of a case is a problem. You have to be very careful with the connections on the bottom.

REVIEW-CHESSBOARD-$10-SAWYER SOFTWARE

EXCELLENT use of PET graphics!!! This program displays a chessboard and maintains it for two players. The time each player spends making his moves is also displayed. Typical chess notations are used to specify moves. Although the program does not check the validity of moves, it does provide for correcting mistakes. Another useful feature of the program is that it stores and retrieves partial games on tape for future completion.

review by Harvey Sherman

REVIEW-CHANNEL DATA BOOK-$20-CHANNEL DATA SYSTEMS

Here is a sophisticated and well packaged version of what the GAZETTE is trying to do. In a beautiful 3 ring binder is information on PET software and hardware with addresses of PET companies and clubs. At present the information seems to be no more complete than other sources. BUT it looks like they are definately on the right track. Updates will be provided FREE throughout 1979. It is a good way to get yourself organized. Dividers are included prelabeled for Hardware, Software, Information sources, Address List, Notes & References, and believe it or not Commodore Communications. We have begged and pleaded for Commodores bulletins and other communications but to no avail. That section will be scantily filled. I am waiting to see what their next edition will be like.

REVIEW-PERSONAL LEDGER-$20-CHANNEL DATA SYSTEMS

As the name implies, this is a true ledger, only to be used for personal finances. You must know bookkeeping to use it. A printer is almost a necessity also, for hard copy records. You can set up accounts (up to 50) and keep track of income, expenses, assets, and liabilities. It is a DOUBLE entry bookkeeping system. You must say where the money is coming from and also where it is going to. There are provisions for saving your data on cassette.

REVIEW-PURSER'S REFERENCE LIST OF TRS-80, PET, & APPLE COMPUTER CASSETTES-$12 per year of 4 issues

Purser is doing such a good job with this reference list that we will leave software listings up to him. He sends a copy of his proofs to each company for their verification to be as accurate as possible. If you would like a near complete list of available software for the PET I reccommend this "magazine". A special feature is pictures of the screen display from many of the listed programs. I think that is a super idea.

REVIEW-METRIC-CALC-$7.95-MICRO SOFTWARE SYSTEMS

This program simulates a powerful calculater. It is stack operated, and lets you see the top five values in the stack continuously. In addition to the MANY calculator functions it will do Metric conversions as well. If you are used to using a good calculator this might be neat.

REVIEW-FOOTBALL-$9.95/2-ZZYP DATA PROCESSING

Here is a very well done simulation of a football game. It is for 2 players with the PET acting as referee. You can choose from many plays while on OFFENSE or DEFENSE. Your choice is important, the result depends upon what offensive play was chosen and what defensive play was picked against it. Random gains and losses are based on this. The game is graphically displayed and even animated, with the football travelling about the field. GET commands are used for your convienence. There are suggestions for modifying the program in the manual that accompanies the tape. The manual explains the program very well. A very worthy addition to your program library, especially if you are a football fan.

REVIEW-CHECKERS-$9.95-CMS

Good graphics highlight the game. You play against the PET. Moves are entered using a coordinate system. PET only allows legal moves. The program is very well done. As with all the checker programs I have played, none are better than average players. An average of better player could beat the PET. But it is very entertaing and lots of fun. If you are just learning to play checkers you should enjoy this program.

REVIEW-BLOCK-$9.95/2-ZZYP DATA PROCESSING

This game is like the arcade game blackade or snake in our exchange. ONE or TWO players may compete. The object is not to run into anything with your wall. Each players wall advances every second or so. Players can change the direction their wall is moving by using the keyboard. A strategy is to try to wall your openent into a corner. Then comes their special addition. Each player has a "transporter". If you use this you are placed at another randomly chosen location on the board. This may be a better place, but maybe not. Block is a fun game, and possible modifications are covered in the accompanying manual.

REVIEW
BLACKBOX @ $7.95
By Dr. Daley

BLACKBOX is a super version of the board game which is currently very popular. It is a mind game which anyone in to computers is sure to enjoy.

The program gives complete instructions, including examples.The object of the game is to locate hidden atoms on a grid.The way this is done is to "shoot" down the lines of the grid. Depending on the location of the atoms your shot can be absorbed by the atom, reflected back to the starting point or bounced off the atom at an angle coming out the grid at another point. The instructions do a good job of explaining what causes each reaction. The different PET graphics are used to show each shot,so after a number of shots you can remember which shot went where.When you think you know where the atoms are located you can display their location.

The difficulty of the game can be varied by picking the number of atoms hidden. By the time you get to four it starts getting tough. All in all it is a great game. By Bill Bendoritis

REVIEW
REALTIME BASEBALL
$12.95 by JERRY BRINSON
PO Box 36014
Indianapolis, IND 46236

As you might guess by the name of this program,it is a baseball game.There are three ways to play it;you against the PET,you against another person, or the PET plays against itself(you just watch).

The game uses extensive graphics. The screen displays a baseball field with home plate at the bottom and the center field grandstands at the top.The players are shown as squares and rectangles on the field.There is a score board displaying balls,strikes,outs,the score,and who is at bat.

The game itself is very simple. When you pitch, you push the appropriate key,and the ball(shown as a quarter square) leaves the pitcher square heading for the batter. If the batter chooses not to swing it will be called either a ball or strike. If the batter chooses to swing(push the right key down), he either misses,a strike being called,or hits the ball. If the ball is hit it can go foul,hit a player(which is an out),or the ball can go past all the fielders into the grandstands. The grandstands are comprised of the letters;S,D,T,H, standing for single, double, triple, and homerun. Which ever square the ball hits is the play. After each pitch the letters in the grandstand squares are changed around,so hitting to the same spot will not always have the same play.

All in all it is a very good game. My only complaint would be the lack of control of more aspects of the play.But this simplicity makes the game playable even by younger children. By Bill Bendoritis

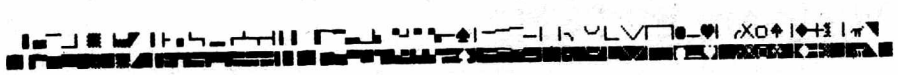
PET Memory Map consolidated from information presented in PET User Notes, PET Paper, PET Gazette, and the work of independent investigators.

Roy Busdiecker

```
0 "    4C,JMP  (USR ADDRESS)
1 "    LO HALF, POINTER FOR USR(X)
2 "    HI HALF,  ML CODE
5 "    CURSOR COLUMN
10 "-90: BASIC INPUT BUFFER
35 " 0 BASIC INPUT BUFFER
90 " - BASIC INPUT BUFFER
92 "   BASIC INPUT BUFFER POINTER
94 "-95: CURRENT RESULT TYPE (FF)STRING,(00)NUMERIC;;(80)INTEGER,(00)F
122 "-123: START OF BASIC STATEMENTS
124 "-125: START OF VARIABLE TABLE
126 "-127: END OF VARIABLE TABLE
128 "-129: START OF AVAILABLE SPACE
130 "-131: BOTTOM OF STRINGS (MOVING DOWN)
132 "-133: TOP OF STRINGS (MOVING DOWN)
134 "-135: FIRST LOCATION BEYOND RAM
136 "-137: CURRENT PROGRAM LINE NUMBER
138 "-139: CURRENT PGM LINE NR SAVED BY END
140 "-141: CURRENT PGM POINTER SAVED BY END
144 "-145: READ POINTER
146 "-147: DATA STATEMENT POINTER
148 "-149: CURRENT VARIABLE SYMBOLS
150 "-151: CURRENT VAR STARTING POINT
176 "0 EXP+128: FLT ACC FOR USR
177 "] MSB:       PARAMETERS
178 "]
179 "]          ( MSB: INTEGER )
180 "] LSB:    ( LSB: INTEGER )
181 "- SIGN FOR FLT ACC
184 "-192: DYADIC HOLDING AREA
194 "    START OF ROUTINE FOR FETCHING NEXT BASIC CHARACTER
201 "-202: PROGRAM POINTER
217 "    END OF CHARACTER-FETCH
224 "    SCREEN POSITION ON LINE   (CURSOR?)//?/-225:BYTE ADDR OF LINE
225 "-226: POSITION OF LINE START (CURSOR?)//?/225: FORCE CURSOR FLIP
226 "    CHARACTER POSITION OF CURSOR (0-79)
227 "    //?/INVERSE VIDEO CURSOR(=1)
228 "-227: CURRENT TAPE BUFFER POINTER
229 "-230: END OF CURRENT PROGRAM
234 "    QUOTE MODE (00 IF NOT)
238 "    NR OF CHARS IN FILE NAME
239 "    GPIB FILE #
240 "    GPIB COMMAND
241 "    GPIB DEVICE #
243 "-244: POINTER TO START OF TAPE BUFFER (! MUST BE POKED FOR FILE WR
245 "    CURRENT SCREEN LINE #
246 "    RUNNING CHECKSUM OF BUFFER
247 "-248: POINTER TO PROGRAM DURING VERIFY, LOAD
249 "-250: FILENAME STARTING POINTER
252 "    SERIAL WORD
253 "    NUMBER OF BLOCKS REMAINING TO WRITE
254 "    SERIAL WORD BUFFER
255 "    BASIC
256 "    TAPE-READ WORKING STORAGE(UPTO511)
511 "    BASIC STACK (DOWN TO 256)
512 "-514: CLOCK THAT INCREMENTS 60 TIMES PER  SECOND (H.M.S.)
515 "    MATRIX COORD (ROW,COL) OF LAST KEY DOWN (255 IF NONE)
516 "    SHIFT KEY STATUS (1 IF DOWN, 0IF UP)
517 "-518: CLOCK THAT INCREMENTS 30 TIMES PER SECOND//?/60?
519 "    CASSETTE 1 ON SWITCH
520 "    CASSETTE 2 ON SWITCH
521 "    KEYSWITCH PIA
523 "    LOAD 0, VERIFY 1
524 "    STATUS
525 "    NR OF CHARS IN KEYBOARD BUFFER
526 "    REVERSE VIDEO
527 "-536: KEYBOARD BUFFER//?/START AT LOC #526?
537 "-538 HARDWARE INTERRPT VECTOR
539 "-540 BREAK INTERRUPT VECTOR
547 "    KEY IMAGE
548 "    CURSOR ENABLE (POKE=0)
549 "    CURSOR TIMING (POKE=1)
551 "    CURSOR TIMING? (POKE=0)
```

```
552 "    TAPE WRITE
578 "-587: LOGICAL NUMBERS OF OPEN FILES
588 "-597: DEVICE NUMBERS OF OPEN FILES
598 "-607: READ/WRITE MODES OF OPEN FILES
610 "    NUMBER OF FILES OPEN//?//GPIB TABLE LENGTH
613 "    PARITY
616 "    POINTER IN FILENAME TRANSFER
620 "    SERIAL BIT COUNT
624 "    TAPE WRITE COUNTDOWN
627 "    LEADER COUNTER
629 "    Ø IF FIRST HALF BYTE MARKER NOT WRITTEN
630 "    Ø IF SECOND "    "     "     "
633 "    CHECKSUM WORKING WORD
634 "-825: BUFFER FOR CASSETTE RECORDER #1
826 "-1023:BUFFER FOR CASSETTE RECORDER #2
1024 "  *** BASIC PROGRAM STORAGE ***
1025 "   -VARIABLES STORED ABOVE PROG
1026 "   -STRING VARIABLES STORED AT          TOP OF AVAILABLE WORKING
4095 "   -LAST LOCATION IN  4K VERSION
8191 "   -LAST LOCATION IN  8K VERSION
12286 "  -LAST LOCATION IN 12K VERSION
16383 "  -LAST LOCATION IN 16K VERSION
28671 "  -LAST LOCATION ADDRESSABLE                (32KVERSION)
32768 "-36863: CRT RAM (PROBABLY ONLY  1K [1000 CHAR] ACTUAL RAM
33864 "-49151: EXPANSION ROM
49152 "-57343: BASIC ROM //?//-57520 MICROSOFT '6K' BASIC
53415 "    ML SUBR TO CONVERT FLOAT ACC($BØ-B5) TO TWO-BYTE INTEGER ($
53860 "    ML SUBR TO CONVERT TWO-BYTE INTEGER (ACC,Y) TO FLT ACC
57344 "---SCREEN EDITOR ROM (TO 59391)
57525 "-57981: SYSTEM SET-UP
58004 "-58986: IDEO DRIVER
58987 "-59012: INTERRUPT HANDLER
59013 "ML SBR TO SVC INTERRUPTS//?/-59227 CLOCK UPDATE,KYBD SCAN (60HZ
59228 "-59348: KEYBOARD ENCODING TABLE
59392 "-61439: PIA'S//?/ I/O PORTS & EXPANSION I/O
59409 "    CRT CTL (52=OFF,60=ON)
59410 "    SENSES KEYS:1-RVS,2-[,4-SP,8-<(WAIT 59410,X,X WHERE X=1,2,4
59411 "    CASSETTE MOTOR CONTROL (53=ON, 61=OFF)
59423 "----FOR NEXT 4 LINES, SEE PET NOTES #4, MAY-JUN78----
59424 "    GPIB INPUT (PEEK)
59425 "    GPIB CA2 OUTPUT (52=LO,60=HI)
59426 "    GPIB OUTPUT DATA (POKE)
59427 "    GPIB CB2 OUTPUT (52=LO,60=HI)
59455 "    WAIT 59456,32,32 FOR VERTICAL RETRACE OF DISPLAY
59456 "    CASSETTE #2 MOTOR (59456 AND  239 = ON, 59456 OR 16 = OFF)
59457 "'MOS6522 8-BIT PORT (PEEK RESETS CA1)   !
59459 "!8-BIT PORT DIRECTION CTL (=255 FOR OUTPUT)
59464 "!RATE CTL (MAR78 PET NOTES)
59465 ",59464: CLOCK THAT DECREMENTS EVERY MICROSECOND
59466 "!SHIFT REGISTER (15,51, OR 85 FOR SQ WAVE)
59467 "!SHIFT REG MODE CTL: 16=FREE-RUN, Ø=NORM!
59468 "!CA1 CTL (JAN78 PET NOTES)//?/  CHARACTER FONT CONTROL (BIT 1)
59469 "'CA1 INT FLAG (SEE PET PAPER#3)
61440 "---I/O, DIAGNOSTICS, MONITOR ROM
61622 "-61990: GPIB HANDLER
62278 "-63532: FILE CONTROL
62279 "-----------------------------
62280 "*BELOW THIS LINE, LINE NUMBERS          ARE NOT MEMORY ADDRESSS
62231 "-----------------------------
62300 "*** 63533-64789: TAPE CONTROL
62400 "*** 64824-65458: DIAGNOSTICS
62401 "*** 64824 SYS(64824) SIMULATES  POWER-ON RESET
62500 "*** 65472-65516: JUMP VECTORS
63000 "*** 65487 ML SBR TO INPUT CHAR
63001 "*** 65490 ML SBR TO DISPLAY CH
63002 "*** 65508 ML SBR TO GET CHARAC
63900 "*** 65530-65535: INTERRUPT VECTORS(NMI NOT USED IN ORIG VERSION
63999 "--- LAST LEGAL LINE NUMBER!!!---
READY.
```

THE PET GRAPHICS



REVIEW
KITES - $7.95
By AB Computers

This is a very unique program. It is a simulation of kite fighting. For anyone who doesn't know, in kite fighting,competitors try to cut the sting of their opponent using razors in the tail or glass inbedded in the string.

The kites are shown as diamonds at the bottom of the screen. One player uses the equal key,the other the RVS. When you push down on your key it is the same as pulling on the string. The kites normally fly in a tight circular pattern, when the string is pulled the kite flies in the direction it was moving when pulled.

To start the game you push down on your key and your kite moves up the screen. When you let go it fkies in a tight circular pattern. Whenever you push your key down the kite moves in the direction it is moving the moment you push it down. The object is to fly right under you opponent and then up as in a slicing motion. If you suceed his kite will crash to the ground.

This might sound simple, but when your opponent is trying to do the same thing to you, it becomes tough and exciting. This is a great program. An added bonus is the instructions include directions on how to build real life fighting kites.

By Bill Bendoritis

REVIEW
SWEE-PING - $5.95
MICRO SOFTWARE SYSTEMS

The ad for this states it is simple enough for kids but exciting enough to hook an adult. It definitely is easy enough for children, but, exciting to an adult, maybe to some.

The program causes the display to reverse(turn completely white) then a ball moves across the screen erasing a path. You can control the path of the ball with the number pad in the manner typical to games which allow you to move in all directions. You are given suggestions on what to do with the game.

The game did what it was supposed to do, but I didn't get hooked.

By Bill Bendoritis

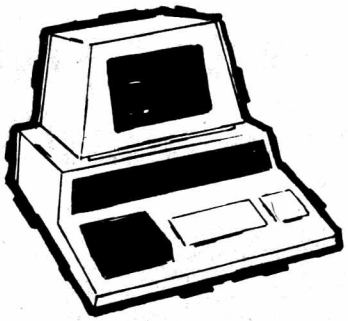
REVIEW
BILLBOARD - $49.95
MICRO SOFTWARE SYSTEMS

This program allows you to use the PET to creat a moving billboard. The display is very large, about 10 lines high. The program allows you to very the rate at which the message moves across the screen,pause the display at any time, and flash the display on and off.

The program has a pre programmed message to show you the programs capibilities. It also allows you to add to or change your message.

This program probably has more use for a business, than an individual, although the night I tried it out I used it to display a message for my wife on what I thought we might do when I was done with my review.

By Bill Bendoritis



MADISON COMPUTER STORE

SUPPORTS THE PET® WITH

SOFTWARE

Made by Commodore:

Mortgage	$ 14.95
Diet Planner and Biorythm	14.95
Galaxy Games	9.95
Basic BASIC (two tapes)	14.95

Made by Connecticut Microcomputer:

Word Processor	29.50

Made by Dad's Reliable Software:

Star-Trek and Stock Market	9.95

Made by Engel Enterprises and Jon Staebell:

Devil's Dungeon	9.95

Made by Instant Software:

Personal Weight Control and Biorythms	7.95
Mortgage with Prepayment and Financier	7.95

Made by Jamestown Small Computer Systems:

Check Management and Add 'Em Up	7.95
Music Mimic	7.95

Made by Personal Software:

Micro Chess 2.0	19.95
Graphics	14.95
6502 Assembler in BASIC	24.95

Made by Sawyer Software:

Business Graphic Pack I	25.00
Financial Pack I	15.00
Accounting Pack I	25.00
Schedule Planner	15.00
Schedule Planner 2	20.00
Chessboard	15.00
Check Book Reconciliation	25.00
Payroll	30.00

Made by ZZYP Data Processing:

Iron Planet and Hangman	9.95
Star Fighter and Asteroid	9.95
Black Bart and Black Bret	9.95

HARDWARE

Second cassette drive from Commodore	$ 99.95
RS-232 interface for printer	169.00
Memory expansion (Expandapet)	
16K	425.00
24K	525.00
Service kit from Commodore	30.00

NEW ITEMS ARRIVING DAILY!

THE MADISON COMPUTER STORE

1825 Monroe Street
Madison, WI 53711

Open 10-6 Monday-Saturday

PET trademark of Commodore Business Machines and Commodore International

You love your PET, but wouldn't you love it more with this BigKeyboard?

The Skyles Big KeyBoard™. More than 15 inches wide. A layout nearly identical to the PET Keyboard and with *all* functions—alpha, numeric, graphics, special symbols, lower case alpha—on full-sized, almost plump, key-tops double-shot to guarantee lifetime durability.

Actual size

S

The switching action uses gold cross point contacts; the torsion springs are gold-plated. The housing is black anodyzed heavy aluminum. The keyboard assembly and housing have drain-holes; to clean the keys of "gook," rinse under clear water and let dry.

Parallel entry and unbelievably easy to install. Connect the PET's keyboard cable to the Skyles Big KeyBoard. Connect the Skyles cable connector to the main board and to the Skyles Big KeyBoard housing. Now you can use the Skyles for fast, finger-easy data entry, the original PET Keyboard for hunt-and-peck graphics entry. And you can disconnect either keyboard—or both—without reopening your PET: just remove the connector(s) from the Skyles housing.

Fully guaranteed, of course: • Use it for ten days. If you don't like it for any reason, return it for full refund; no questions asked • Guaranteed for 120 days; we'll repair or replace at no charge if the Big KeyBoard proves defective for any reason short of malicious mischief.

Order the Skyles Big KeyBoard now. Enjoy it within weeks. We'll ship it by air and prepay all shipping and handling on orders placed with the enclosed coupon.

(And see the other side of this page for information on the Skyles Memory Expansion Systems.)

☐ I'd like to purchase these Skyles products now. I understand that I may return any Skyles product within ten days for immediate and complete refund.

_____ **8KB** **8K Memory Expansion System(s)** at $250: *(15,359 bytes free: Adds 8,192 bytes to the 7,167 bytes resident in your PET)* $ _____

_____ **16KB** **16K Memory Expansion System(s)** at $450: *(23,551 bytes free: Adds 16,384 bytes to the 7,167 bytes resident)* $ _____

_____ **24KB** **24K Memory Expansion System(s)** at $650: *(31,743 bytes free: Adds 24,576 bytes to the 7,167 bytes resident)* $ _____

_____ **74KB** **Big KeyBoard(s)** at $125: $ _____

Orders placed now (see other side for ordering information) will be shipped by air prepaid: Skyles will absorb all shipping & handling costs.

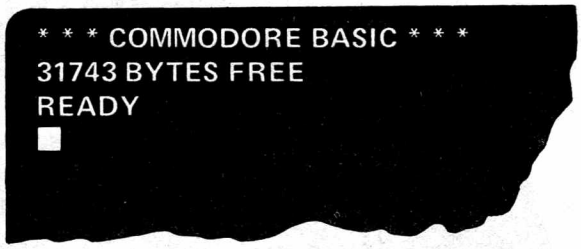
TOTAL $ _____

COMMERCIAL AGENTS FOR
Skyles Electric Works

599 N. Mathilda Ave., Suite 26
Sunnyvale, California 94086

(OVER)

Would you like to turn on your PET . . . and see this

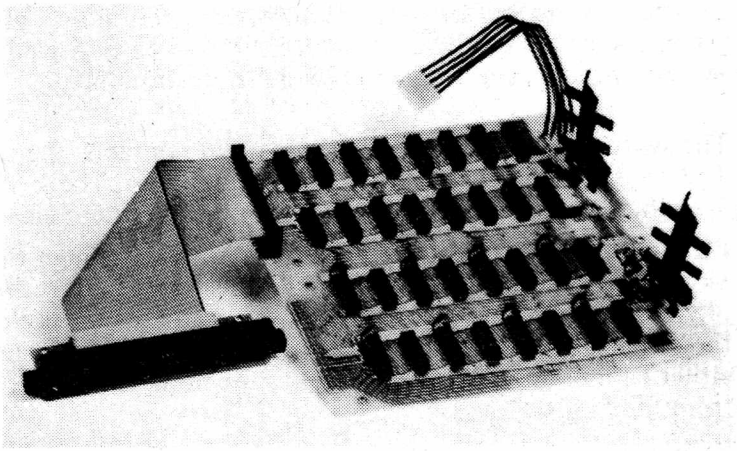


You could and right now, if you had the Skyles 24KB Memory Expansion System . . . or you could have 23,551 bytes free with the 16KB System . . . or 15,359 bytes free with the 8KB.

Skyles Memory Expansion Systems are complete; nothing more to buy. • First quality static RAMs • Solid soldered on first quality glass epoxy board • Separate PET Adapter Printed Circuit Board connects directly to data bus on your PET—no rat's nest of hanging hand-wiring • Ribbon cable and 50 pin connectors that keep your PET open to the outside world (one on the 8KB; *two* on the 16KB and 24KB).

Skyles Memory Systems install in minutes with no special tools or equipment . . . other than an ordinary screwdriver.

From Bob Skyles, formerly Chief Engineer for several personal computer companies and instrumental in making the PET a deliverable, off-the-shelf reality.



All Skyles products are double guaranteed: If not completely satisfied, return it within ten days for a full refund. And if the Skyles product should prove defective for any reason—short of malicious mischief—within 120 days, we'll replace or repair at no charge.

Order now for guaranteed delivery within four weeks; we'll ship your order by air and prepay all shipping and handling on orders placed now.

So use the handy coupon to order. (Please fill in both sides.)

For the Skyles products indicated on the other side of this coupon,

☐ I enclose my check or money order for $_____*
*California residents: Please add 6% sales tax; Santa Clara County, California: 6.5% tax.

☐ I'd like you to charge the total to:
☐ BankAmericard/VISA Account #_____
☐ Master Charge Expires_____

NAME_____

ADDRESS_____

_____

SIGNATURE_____

☐ *I'd like further information; please keep me on your mailing list. And please let me know the name of the nearest dealer.*

(OVER)

PET CASSETTE EXCHANGE

$1.00 per program copying/handling fee

GAMES

- Art Auction-sub Foreman (Creative Computing)
- Bagels-PEOPLES Computer Company Games Book
- Bank Line Simulation-Advanced BASIC
- Baseball-Kilobaud
- Baseball-Peoples Computers July 78
- Batnum-BASIC Computer Games
- Battleship-Mike Richter
- Battleship-Kilobaud July 78
- Black Box-BASIC Computer Games
- Blockade-Jim Stanley
- Boggle-Mike Richter
- Bomber-BASIC Computer Games
- Breakout/sound-sub R Julin
- Breakout/machine language parts-JK Johnson
- Brick(Breakout sideways)-sub John Coppage
- Budget Game-BASIC Computer Games
- Bug(Cootie)-BASIC COmputer Games/M Richter
- Button Button-Peoples Computer Company Games
- Checkers-BASIC Computer Games/H Sherman
- Chemistry-BASIC Computer Games
- Civil War-Best of Creative Computing I
- Concentration/sound-Tim Onosko
- Craps-BASIC Computer Games
- Cryptograms-Personal Computing Aug 78
- Crypto-one-Tim Onosko
- Cupidity-Personal Computing Sep 78
- Cyberchips-BASIC Computer Games
- Darts-Paper
- Deepspacer-D Langford/ENGLAND
- Deflection-PET User Notes 3
- Deflection (mines)-P Rowe
- Depth Charge-Best of Creative Computing I
- Dogfight-Paper
- Dot Racer-sub R Julin
- Dragon Hunt-Sphinx
- Eliza 5-Creative Computing/P Weiler
- Flip Flop-BASIC Computer Games
- Football-sub J Staebell
- Gamebox #1:Hurkle, Dragon Island, Chomp, Guess a Number-Peoples Computer Company
- Golf-BASIC Computer Games
- Gomoku-Roy Obrien
- Guess(Hi Lo)-sub R Julin
- Hamurabi-BASIC Computer Games
- Hamurabi-Personal Computing #1
- Hexapawn-BASIC Computer Games
- Hi Lo-Ed Steinfeld
- Horserace-Kilobaud #2
- Horserace-Walters
- Hunter-sub R Julin
- Hurkle-Peoples Computer Company Games
- I Ching-57 Practical Programs & Games
- Jive Turkey(Hi Lo with Lies)-?
- Jumble-Hoffheinz
- Klingon Capture-Kilobaud
- LEM-Best of Creative Computing I
- LIFE-Cohen (no source needed)
- LIFE Game-BASIC Computer Games
- LOVE-BASIC Computer Games (needs printer)
- Lunar Lander-Obrien
- Lunar Lander-Walker
- Magic Square-BASIC Computer Games
- Market 3-Peoples Computer Company Games
- Mastermind-Pete Weiler
- Maze Runner(without maze yet)-L Lindsay
- NIM-PET User Notes 4

-continued-

PET CASSETTE EXCHANGE

- One Check-BASIC Computer Games
- One Queen-Miles/ENGLAND
- Orbit-BASIC Computer Games
- Oregon Trail-Creative Computing/Richter
- *****NOTE: 7 Othello/Osero programs follow would some one like to get them all and come up with a SUPER version
- Osero 6.3-Walker
- Osero(vs. PET)-sub R Julin
- Othello-ROM
- Othello-JK Johnson
- Othello-Byte Oct 77
- Othello for 1-Paper
- Othello-Fultz
- Petals around the Rose-Personal Computing
- PET Pong-Jon Staebell
- Pig Latin-M Turner
- Pong For the PET-Peoples Computer Company
- Pong-Cohen
- Pop Shot/sound-?
- Quibic-Kilobaud 4/78/Louder
- Racetrack 2-PET User Notes 3
- Random-Cohen
- Reverse-Walker
- Reverse-Richter
- Roulette-BASIC Computer Games
- Roulette,PET-Personal Computing 7/78
- Run-Jon Staebell
- Schmoo-Al Chu
- Sea War-Paxton
- Slot Machine-Mike Richter
- Snake 2-P Rowe
- Spacebattle-D Daley
- Space Shooter 2-Dave Howe
- Splat-Dave Beck
- Splat-BASIC Computer Games
- Star Fighter-?
- Starlanes 9-Interface Age
- Stars-Peoples Computers Jan 78
- Startrek(M)-sub R Julin (movement)
- Startrek/sound-sub Miles-ENGLAND
- Stock Market-BASIC Computer Games
- Submarine Search-sub Foreman
- Swat & Doodle-PET UserNotes
- Swords & Sorcery-Kilobaud Aug 78
- Tac-Tix-sub Foreman
- Tic Tac Toe-Mike Richter
- Tic Tac Toe 3D-Panofsky
- Tommy Termite-Harvey Sherman
- Trap-BASIC Computer Games
- 23 Matches-BASIC Computer GAMES
- Twonky-Reddish
- Wrap Trap-Miles-ENGLAND
- Wumpus-Kilobaud/Weiler
- Yahtzee-P Rowe

USEFUL

- Addressbook-R Osgood
- Apartments-Walker
- Assembler-Micro
- Auto Line Eraser-Lindsay
- Auto Line Numberer-Weiler/Lindsay
- Bar Graph-Hoffheinz
- Bar Keeper-Personal Computing Aug 78
- Benchmark Series-L Lindsay
- Big Alphabet-Onosko
- Biorhythm(P)-Personal Computing Nov 77
- Biorhythm(TV)-Sphinx
- Biorhythm(TV2)-Finn
- Biorhytnm(P2)-Mellisa

-continued-

-continued-

•• Brass Pounder(Morse Code)/sound-H Sherman
• Budget 4-John Coppage
• Case Converter-Weiler
Checkbook-Bach
Checkbook-Whitmire(Data Statements)
Checkbook-John Coppage
Clock-B Swartz
• Clock(L.E.D. circles)-John Coppage
Core Dump-Schwilk
•• Data Entry Demo-3 separate programs-Purser
•• Decision Maker 3-Kilobaud July 77
• Digital Clock-Lindsay
Directory-Dilts
Directory,Files-Cumberton
Directory,Tape Lib-Finn/Mehaffey mods
Disassembler-McCann
• Disinterpreter-PET User Notes 3
Do All-Kilobaud
• Dynamic Keyboard-Louder
• Easy Reader-Cumberton
Employer Tax-Walker
File Copy-Julin
••File Manager 3-Cumberton
Files-D Daley
File & Sort-PET User Notes
Finance-Kilobaud 8/78
Find & List-PET User Notes 5
Find, List & Replace-PET User Notes 5
Finegraph-Barry Swartz
Financial Analysis-J Coppage
• Forms Demo-Paper
Global-Walker
Hex/Dec Conversion-?
Histogram-Christy
Household Finance-Interface Age Dec 77
HP 45 Simulator-Miles-ENGLAND
Input Routine for sound-Lindsay
Inventory E.O.Q.-B MILES-ENGLAND
Labels-J Coppage
Lifetime-J Coppage
Lifetime-Kilobaud 11/77
Linear Regression-Dilts
Loan Amortization-Walker
Loans 2-Walker
Mean-Dilts
Memory Dump-ENGLAND-Miles
Memory Map-Beck
Memory Poker-J Coppage
Memory test-Paper #5
Miles per Gallon-P Smith
Monitor/SYS(1039)??
Monitor/SYS(7171)??
Monitor-Lomon
Monitor-Himon
Morse Code Reader-Kilobaud
Multiple Precision Hex Arithmetic-Richter
Multiple Regression-H Sherman
• Name & Statistics-Nelson
• NFL Forcaster-E Burkhardt
Number/Base Converter-Creative Computing3-6
Plot-Peoples Computers 7-1
Polynomial Regression-Keyboard-Dilts
Polynomial Regression-Data Statmt-Dilts
Prime Number Generator(data tape option)-
Kortendick
Profit Volume-Miles-ENGLAND
• Readability-Kilobaud 2/78

-continued-

Renumber-?
Renumber & Unlist-Paper
•• Resequence(including GOTO's etc)-Paper #8
6502 Dissassembler-Micro 7/78
Sort-Miles-ENGLAND
Sort-Panofsky
Sort Routine-Paper
Stock Options-Creative Computing Sep 78
Tape Copier-Walker
3D Plot-Miles ENGLAND
• Typewriter 6A-Richter
• Variables List-Sphinx
• View-PET User Notes

EDUCATIONAL

• Adding with Blocks-T Esbenson
Addition Game-Paper
• Alphabetizing-T Esbenson
Alpha Drill-Walters
•• Animal-BASIC Computer Games/Onosko
Data tape for Animal is not
necessary but available for added
fun- 1 extra tape.
•• Bid-T Esbensen
• Capitols-Strasma
Childs Play-Interface Age 9/78
•• Clock-T Esbensen
Decimal Devision-Mathmatics for Individ.
Fractions-Sphinx
Grades-Paper
Haiku-Ed Steinfeld
History Quiz-Jim Stanley
• Letter Matching-T Esbenson
Letters-Kilobaud
• Letter Sequence-T Esbenson
• Mad Lib/Funny Stories-BASIC Computer Games
Marblestat 3/sound-Calculators/Computers
Math Games-Data Systems
Math Mult & Add-L Smith
Math Quiz-Paper
• Math Drill(horizontal)-Strassma
• Math Drill(vertical)-Strassma
Math Quiz-Tushnet
•• Poetry Generator-Miles-ENGLAND
Prime Tester & Generator-Tushnet
Reduce Fractions-Clark
• Rhymes-T Esbenson
Scientific Notation Drill-Michels
• Speed Reading-H Sherman
• Spell-T Esbenson
Spelling Bee- Personal Computing
•• Spelling Test-Jon Staebell
• States & Capitols-T Laudereau
•• State Capitols/sound-Kilobaud 3/78
•• Story Problems-K Flee
Triangles-N Obrien
•• Wilbur Math-Walker

CARDS

• Acey Deucy-Jon Staebell
•• Blackjack-Sphinx
Blackjack-BASIC Computer Games
Card Deck-Walters
•• Poker(against the odds)-D Howe
• Spades 1&2 - 2 programs-Revis
• War-Onosko

-continued-

FREE SOFTWARE?

Now that I have your attention, let me plainly announce that there is no such thing as free software. Some software might seem like it is free, but even a closer look at the PET cassette exchange in the PET Gazette costs a program and $1. Someone had to spend some time in preparing the program that you submit to the exchange. Now, I don't want to downgrade the exchange, I have exchanged programs myself to obtain some of the more interesting ones there. It can and does serve a useful purpose.

A major problem of the exchange, and other similar exchanges, is that some of the more unscrupulous users submit programs which they have not prepared themselves. That is, they have ripped off some other person's effort in writing, debugging and documenting a program. Let us take a moment to explore the consequences of this type of action.

Good software, be it a game or systems software, is very expensive to prepare. It is complicated, laborous to develop, and requires effort to find all the ways in which the user can bomb the program, and then to prevent the bombing from happening. Typically this process requires about 10-15 minutes for each line of BASIC code. A typical 8K PET program then might require 100 or more hours to develop and prefect. This 100 hours is a considerable investment in effort. This probably means that this typical 8K program represents at least $1000. worth of effort. Somebody has to pay for that cost. If you want to have low-cost (to the user) software, there must be a way to pay for it. Software is not, and cannot be, free.

For the user to give this software away then removes the incentive for the developer to continue writing programs. The programmer produces software on venture capital and hope to sell enough of the packages to recover the investment. For what the user might consider a reasonable price, then a very large volume is necessary. For instance, if we assume that my $1000. worth of effort is to be recouped, then 100 each must be sold at $10. each. This neglects to include our costs. If it costs $5. each to produce the tape, advertise it and ship it to the user, then 200 packages must be sold.

Investigation of the alternatives points out the sad fact that if the user further distributes my software, then that takes my incentive to develop further software and put effort into distributing programs. If I can't recover at least a major portion of my investment, then I won't continue to develop programs. If I (or some of my competitors) stop publishing programs then you, the user, will suffer a great software vacuum. Much of the neat work that is now being done would not be generally availible.

Finally, please note that much of the software is copyrighted. Giving it away is illegal. Many software vendors are going to begin to prosecute if the great software ripoff continues. In fact, many offer rewards of $10,000 to 25,000. for arrest and prosecution of copyright violators.

Please Support your local software vendor. — DR. DALEY —

PET Cassette Exchange

-continued-

DEMO
Assembly Show-Kortendick
• Brownian Ball-Breck
Computer Art-Lindsay
Dazzler2-Walker
•• Demo 3A-?
Demonstration-Computer Notes Jan 78
• Draw/DynaKeyboard-Peoples Computers
• Kaleidescope 2-Richter
Kaleidescope(variable)-?
Keyboard Demo(with Explanation)-Walters
•• Keyboard Demo-Miles-ENGLAND
On Gosub Ball-Lindsay
Patterns-Wuchter
Snoopy Dance-?
•StarWars Pictures-4 programs-?
Symetrical Sumbols-Tushnet
• Wallpaper-Mainwaring

•• List Protection(can't list your program)
DEMO-Len Lindsay (2 programs)

MUSIC

Brown Jug-Coughlin
Dixie-Anderson
Java-Coughlin
• Joplin/Clock-Cumberton
Music-PET User Notes 4
Music Keyboard-Onosko
Music Mistro-Onosko
• Music at Random-Onosko
Oh When the Saints/Country Gardens-Coughlin
Peg O My Heart-Rosier
PET Music-Onosko
• PET Organ-Anderson
• PET ORGAN-Ketchum
• PET Song-Toy-
• StarWars Theme-Coughlin
Twinkle Twinkly-Nelson
• William Tell-Coughlin

USE ORDER FORM AT END OF MAGAZINE

PERSONAL SOFTWARE -- MATADOR

You are a matador, a bull is charging at you. What do you do? You must think fast. It is a real time game.

It is very hard to win. The time allowed for you to read what happened and to respond is much to short (like 2 seconds) and the bull will gore you if you do not enter your move. You can do 3 variations on twirling your cape and two types of stabs.

We have yet to see someone kill the bull without changing the program. After altering the program to give better odds we finally won.

This is a frustrating game.

PERSONAL SOFTWARE -- ONE QUEEN

A Challenging Puzzle strategy game. You challenge the PET to move a queen on a chess board to the lower right hand corner, alternating turns, and beginning on the square of your choice on the top row or left side column. The queen moves like a queen in chess, but only may move down, right, or diagonal toward the lower right.

The graphic display is large and excellent. The PET plays a perfect game and it took us awhile to be able to beat it. (At first we thought it was impossible).

The PET shows each move as you go until someone moves the queen to the lower right corner square. The PET will tell you if you try to cheat and ask you to make a legal move.

A good thinking game. Once you figure out the strategy, you should be able to win most of the time.

USE THIS FORM

PET CASSETTE EXCHANGE

MAKE A COPY OF THIS

For each program that you send us which we do not already have we will send you one program of your choice from the list in this issue. If the program you are requesting is noted as being taken from a listing, then you must also own that source. You may send us programs adapted from magazine or book listings as long as you tell us the source.

We hope that everyone will be adding sound effects to their programs now. See our special section on Music for more information on it.

If you improve any program we send you please send us a new improved version to update our Exchange.

PET CASSETTE EXCHANGE FORM

Note: please photocopy this page if you wish to leave your GAZETTE intact.

I am submitting the following programs. They may be used by the Microcomputer Resource Center and the PET CASSETTE EXCHANGE.

PROGRAM TITLE	AUTHOR	SOURCE

In exchange for these I would like the following: I am enclosing a $1.00 copying and handling fee for each program I request. I own the source listing of any as noted.

PROGRAM TITLE	SOURCE

I own all source listings for the programs I am requesting above as listed in the BEST OF THE PET GAZETTE.

CHECK THE APPROPRIATE BOXES:

[_] My programs are for a 1 for 1 exchange only
[_] My programs may be used as part of the "PAK's"
[_] Consider any "credits" for my programs as a donation
[_] Please issue "credits" for each program distributed, good for some free programs from the exchange

CHECK ONE OF THE FOLLOWING ALSO
[_] Include my name and address in the program listing
[_] Include only my name in the program listing
[_] Do NOT include my name in the program listing

signed_____

date_____

My correct address is:

_____

_____

_____

NO TRADE needed for these

We now will begin to provide programs from our exchange to PET users who have no programs of their own to exchange. The 1 for 1 exchange will continue of course. Since sales and royalties are a hassel (IRS & more) for us and the program authors we plan to funtion as follows:

We will have packages of 6 programs available to anyone without any programs required in exchange. There will be a copying charge of $1 for each program, $2 charge for the tape (the tape is the BEST we know of, AGFA in screw type, top of the line cases), $1 charge for the cassette box and postage, and $1 handling charge (paper work is a pain). Thus you can get 6 programs for $10. (NOTE we are not selling the programs)

Rather than give the authors a royalty check we will offer them "credits" towards FREE programs from our exchange. Thus they will not have any extra IRS problems and get some more programs (what they probably want anyway). Most program authors thus far have told us to keep any "royalties" or "credits" as a donation (And we sure appreciate that).

We now can send you 6 programs we thought were the best in each of the following categories for only $10.00*.

The 6 programs come on one tape, individually recorded, guaranteed to LOAD and RUN. Next issue will include complete descriptions.

*$10.00 is to cover $1 each program copying charge, $2 for the tape, $1 for the cassette box and postage and $1 for handling.

$10 for each CASSETTE PAK

Name _____

Address _____

_____

City/State_____ Zip _____

Please Print or Type

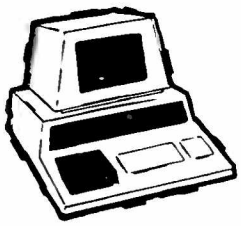
Please send me the following PAKS at $10.00 each.

- ☐ **EDUCATIONAL PAK 1**
- ☐ **DEMO PAK 1**
- ☐ **GAMES PAK 1**
- ☐ **MUSIC PAK 1**
- ☐ **USEFUL PAK 1**
- ☐ **BEST OF PAK 1**

AMOUNT ENCLOSED

$_____

Both programs
$7.95



NEW!!! FOR THE PET®

CHECK MANAGEMENT

HOME BOOKKEEPING PROGRAM

At last! A three-part program designed to help you keep your checkbook balances correct . . . to reconcile your bank statement . . . to balance your budget or help to establish one. All in one program—ready to load and run!

PART 1 — BALANCE CHECKBOOK LINE-BY-LINE
Gives the correct balance after each check, deposit or service charge. Prompts you for each check number to avoid "missing" checks—then gives a summary of the check numbers written and totals. *It even warns you if you're overdrawn!*

PART 2 — BANK STATEMENT RECONCILIATION
Takes you step-by-step through the reconciliation—then gives a summary of checks outstanding, deposits in transit, total service charges, and the correct balance you should show in your checkbook.

PART 3 — BALANCE BUDGET BY EXPENSE ITEMS
Using the ten common home budget classifications—or any ten of your choice—you enter checks (or cash expenditures) and the budget item each is for. When you're done, the program summarizes your target percentages, actual percentages, total expenditure for each classification, number of checks written and the gross amount for all checks.

Designed to be easy to use—especially for spouse who has a hard time keeping the checkbook current! Full "prompting" leads the user through the various steps . . . even catches many of the mistakes you may make.

PLUS **FREE** ADDED BONUS!

ADD 'EM UP (with sound effects)

AN ADDITION TUTOR AND GAME FOR THE KIDS

Choose from easy, medium or hard addition problems—play against time, or the current records of right and wrong. You get two chances to enter the correct answer . . . if you get both wrong, the correct answer is shown and that problem stored for later review. For added fun (and incentive) appropriate sound effects are included. *(requires your audio amplifier connected to user port—also available from Jamestown Small Computer Systems—but program runs with or without the sound effect option)*

Choose any *two* of the following programs for just $7.95 postpaid!

CHECK MANAGEMENT
A three part program to keep correct checkbook balances, reconcile your bank statement, to balance or help establish a budget.

ADD'EM UP
An addition tutor for kids with sound effects.

MUSIC MIMIC
A "Simon Says" with sound. The Pet displays a musical staff, and plays a note. The player responds with the same note. The first note is then replayed and another added and so on for 5, 10, or 20 notes. If the player gets all correct then the computer plays a song as a reward.

SOUND SAMPLER
A demo tape showing how to generate sound—uses the PET CASETTE conventions.

ANIMATED RUN
A short demo tape showing animated graphics and sound.

PIZZA, PORCUPINES, & PAUL
Uses player's string variables to generate random word math problems. Combinations of addition, subtraction, miltiplication and division. Whole number answers only.

Prompt shipment from stock!

ANOTHER FINE PET® PROGRAM FROM:

JAMESTOWN SMALL COMPUTER SYSTEMS / 2508 Valley Forge Drive / Madison, WI 53719

PET trademark of Commodore Business Machines and Commodore International

THE PET GAZETTE IS PRINTED BY FLEETWOOD GRAPHICS

6333 ODANA ROAD
MADISON, WISCONSIN 53719

TYPESETTING—CAMERA WORK—ARTWORK—PRINTING
BY PEOPLE WHO UNDERSTAND MICROCOMPUTERS

LET US QUOTE YOUR NEXT PRINTING OR TYPESETTING JOB.

PET GAZETTE
1929 Northport Dr. Room 6, Madison, WI 53704

BULK RATE
U.S. POSTAGE
PAID
PERMIT 2615
MADISON, WI

Other COMPREHENSIVE newsletters besides the PET GAZETTE (free) are:

*PET USER NOTES ($6), Box 371, Montgomeryville, PA 18936

*SPHINX PET NEWSLETTER ($4.50), Lawrence Hall of Science, Computer Project, Univ. of CAL, Berkeley, CA 94720

ADVERTISEMENT ONLY ADVERTISEMENT ONLY ADVERTISEMENT ONLY ADVERTISEMENT

THE PAPER P.O. BOX 43 AUDUBON, PA. 19407

The only comprehensible monthly newsletter dedicated to owners of the Commodore PET 2001 Personal Computer!

FEATURES:

* Teach Your PET to Bark
* PET Variables Exposed
* Memory Map
* User Group Notes
* Introduction To BASIC
* Sequential Program Storage
* Cursor Control - For Elegant Graphics
* Data File Read & Write Routines That WORK!
* Using the GET Command
* Hardware & Software Reviews
* Answers to Reader Questions
* Interfacing Tips
* ST - The Status Word
* News From Commodore
* Cassette I/O
* New Product Announcements
* Program Listings
* Hardware How-To's
* Where To Find Expert Help
* PETANIMATION
* Interface A 2nd Cassette
* PET Editing

SOFTWARE:

FLEA MARKET EXCHANGE

Send us a program you have written and we'll send you a program of your choice from our library of over fifty user-submitted programs (all are described in THE PAPER). Please include $2.00 for postage and handling. Or send us $5.00 per program without an exchange. The Exchange Library contains such titles as:

* USEFUL ROUTINES
* ROAD RALLY
* AIR WAR
* TYPEWRITER
* MATH QUIZ
* SPADES
* DARTS
* SLOT MACHINE
* EMPEROR
* DISASSEMBLER
* RENUMBER & UNLIST
* YAHTZEE
* HANGMAN-GRAPHIC
* SKY-DIVER
* OTHELLO FOR ONE
* OTHELLO FOR TWO
* AMORTIZATION
* CORE DUMP
* KEYBOARD UTILITY
* DICE
* SPACE CONVENTION
* FLEA PAK (Seven different tapes with four programs each)

SOFTWARE SHELF SUPER STUFF

The Software Shelf contains programs of professional quality submitted by our readers and distributed by THE PAPER on a royalty basis. All Software Shelf Programs are described in THE PAPER. Currently, the Software Shelf contains such titles as:

* BLACKJACK ($10)
* CHASE ($10)
* STARTREK ($10)
* STAT II ($20)
* XMON ($15)
* MICROMAZE ($7.95)
* SPACE FIGHT ($10)
* DEFLECTION ($10)
* AIR-SEA WAR ($7.95)
* DATA EDIT ($10)
* PET BASIC COMPLEAT (Manual & tape - $39.95)
* CMC/WPP (Complete Word Processing - $29.95)
* BLOCKADE ($10)
* HOSTAGE ($7.95)
* STAT I ($20)
* DATA RETRIEVAL ($10)

A subscription to THE PAPER includes ALL 10 ISSUES OF VOLUME I! Send $15.00 (cash, check, money order in US funds) or charge to your BAC/VISA/MC credit card. Sorry, no C.O.D. or credit available. Outside USA & Canada, add $10 for AIRMAIL postage.

NAME_____

ADDRESS_____

CITY, STATE, ZIP CODE_____

MC/VISA/BAC #_____BANK #_____EXP DATE_____

ADVERTISEMENT ONLY ADVERTISEMENT ONLY ADVERTISEMENT ONLY ADVERTISEMENT