

THE PET[®] GAZETTE

SPRING 1979

HOT NEWS

ATTENTION ALL Software Companies and Programmers. Your worries are over. You now can market your programs without worrying about unauthorized copying. BC COMPUTING (2124 Colorado Ave, Sun Prairie, WI 53590) will do all the work for you. Simply send them your program (with only a few spare bytes of memory) and a slight fee. Your program will be returned to you quickly, completely protected from copying AND listing. Many of the good people here at the GAZETTE were involved in swinging this deal. Many EXCELLENT programs are not being marketed simply due to a fear that their hard work will be copied in only minutes. The message is clear. If your friend has a purchased program you like—BUY a copy for yourself. Don't copy it. The PET GAZETTE will NOT explain how to get around software protection. Duplicating a copyrighted program is illegal.

SNEAK PREVIEW—PERSONAL ACCOUNTING SYSTEM

Programma International, 3400 Wilshire Blvd. Los Angeles, CA 90010. Here is a professional SYSTEM of programs. The PAS includes 6 programs: TAPE TRANS, REGISTER, TAPE EDIT, RECONCILE, OUTSTANDING, and SUMMARY. A manual with examples is also included. Data tapes are shared between the 6 programs. I was fortunate to receive tape #0003 and after running all the programs I was very impressed. Passing DATA back and forth between programs is very efficient and saves your time retyping information. Watch for our REVIEW next issue. Till then, it exists and looks GREAT.

RAMBLINGS ON . . .

This issue of the PET GAZETTE was done mainly with our PET, Connecticut Microcomputers Printer Adapter & Word Processor, and a Skyles BIG Keyboard for fast touch typing. There should be a little something for everyone. Lots of reviews of course. REMEMBER—these are reviews for users written by users. We are not CONSUMER REPORTS nor try to be. We do not analyze all details. BUT if it is reviewed you know that it does exist. We do not review products until we have a copy.

WARNING— Do NOT buy any PET product unless you are sure that it exists.

The BEST OF THE PET GAZETTE is still available, list price only \$10. It includes over 100 reviews, 20 program listings, and many articles to help you. Mail us your donation now and we will mail your copy to you.

Remember, this is your magazine. Send us an article or review for our next issue. We prefer you send it as a data tape made with one of the 3 word processor programs we already have:

Word Processor Program by Connecticut Microcomputer
Word Processor by Mike Richter from our PAK 1 series
CED from CURSOR Cassette Magazine
(also any other newly released word processor programs)

This is easiest for you, allowing you to correct your mistakes. It is VERY handy for us. We can fit it into whatever space is available. Single spaced typed is OK otherwise.

Most artwork in this issue is by M. Kirjola. I hope you enjoy the pictures as much as we did. Any artists out there are welcome to send us some sketches for use in future issues.

We hope to keep the GAZETTE on a free basis as long as possible. But rising printing costs, paper shortages and increasing size make your donations just that more important. We ask for your continued support—or a least some idea what you would expect if we were forced to go to paid subscriptions. Let us know! We swapped ads with other computing magazines so you would be aware of them. We print their ads free—and they print our ad in their magazine. We highly recommend these magazines. Also watch for our ads in April Creative Computing, May Recreational Computing, March Calculators/Computers and February Purser Computer Cassettes.

AXIOM now is shipping printers and plotters that plug into the PET and print full PET graphics.

CONNECTICUT MICROCOMPUTER is offering a free updated version of its Word Processor Program to those who have the original version.

A Handwriting analyzer will soon be announced for the PET for under \$50.

NOTICE on our EXCHANGE

Our cassette exchange is SUFFERING from LONG delays, often over a month. Our apologies to those waiting patiently, but we are trying. We just happen to be swamped over our heads.

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The information in this magazine is for information purposes only and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies.

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REVIEWS LISTED ON BACK COVER!

NEXT ISSUE

- Can SEX sell computers?
- Interview with the DRAGON (Bob Albrecht)
- Special book review section. (send us a review of any computing book you've read)
- PET fun without games. (or How to Fool Around with your PET)

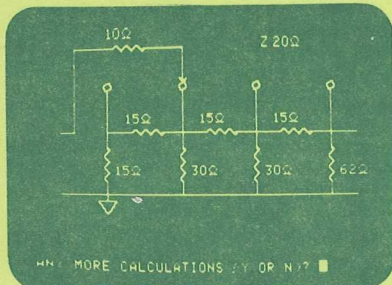
APPLE II®

QUALITY SOFTWARE

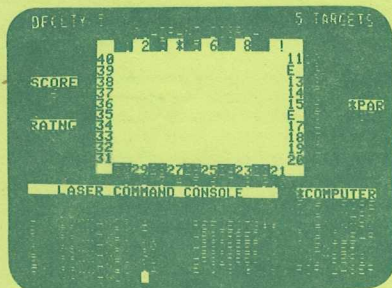
PET®



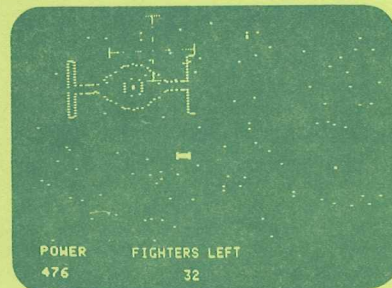
3-D ANIMATION A-\$24.95



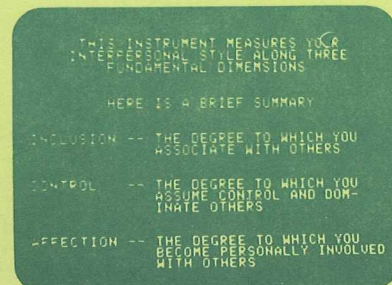
AUDIO ENGINEER A-\$29.95



STRATO LASER A-\$15.95



SUPER STARWARS A-\$15.95



ANALYST A-\$19.95

Apple FORTH
Pet FORTH

FORTH is a unique threaded language that is ideally suited for systems and applications programming on a micro-processor system. The user may have the interactive FORTH Compiler/Interpreter system running stand-alone in 4K to 6K bytes of RAM. The system also offers a built-in incremental assembler and text editor. Since the FORTH language is vocabulary based, the user may tailor the system to resemble the needs and structure of any specific application.

Programming in FORTH consists of defining new words, which draw upon the existing vocabulary, and which in turn may be used to define even more complex applications. Reverse Polish Notation and LIFO stacks are used in the FORTH system to process arithmetic expressions. Programs written in FORTH are compact and very fast.

APPLE II COMPUTER \$34.95
PET 2001 COMPUTER \$34.95

Apple PIE

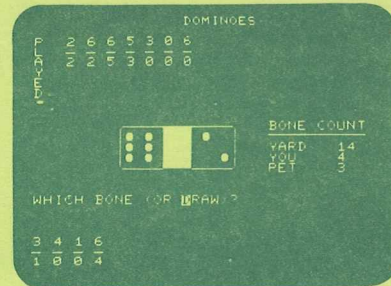
PIE (PROGRAMMA IMPROVED EDITOR) is a two-dimensional cursor-based editor designed specifically for use with memory-mapped and cursor-based CRT's. It is totally different from the usual line-based editors, which were originally designed for Teletypes. The keys of the system input keyboard are assigned specific PIE Editor function commands. PIE includes the following features: blinking cursor; cursor movement up, down, right, left, home, plus tabs; character insert and delete, string search forwards and backwards; page scrolling; GO TO line number, plus top or bottom of file; line insert and delete anywhere on screen; append and clear to end of line; move and copy buffer.

APPLE II COMPUTER \$19.95

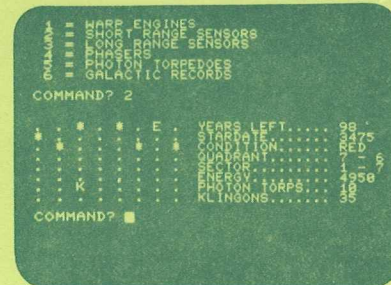
All orders include 3% postage and handling. Apple II is a registered trademark of Apple Computer, Inc. Pet is a registered trademark of Commodore International and TRS-80 is a registered trademark of Radio Shack. California residents add 6% sales tax. VISA & MASTERCARD Accepted.



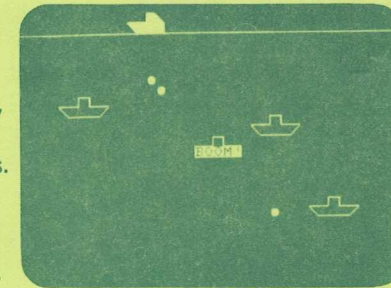
APPLE II LIGHT PEN \$34.95



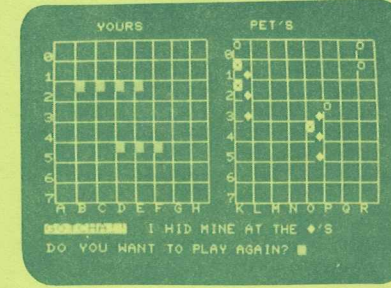
DOMINOES P-\$9.95



STARTREK P-\$9.95



DEPTH CHARGE P-\$9.95



BATTLESHIP P-\$9.95

PROGRAMMA INTERNATIONAL, Inc.
3400 Wilshire Blvd.
Los Angeles, CA 90010
(213) 384-0579
384-1116
384-1117

Dealer Inquiries Invited

PROGRAMMA

Software Products

NOTICE

Have you ever been tempted to make a copy for your friend of that neat program you just bought for \$14.95? Aside from the fact that it is illegal to give away copies of copyrighted programs, it also has serious long range side effects. After spending weeks writing, debugging, and perfecting his program, John Doe will be disappointed if only a few copies can be sold because users are passing around copies for free. Then he finds out that someone else is selling HIS program. That takes the cake. He just wrote his last commercially available program. If this happens too often all the good programmers will quit producing those neat and useful programs. Then all PET users will suffer. So, if you really like a program, support the person who spent the time to create it -- BUY a copy.

PET EXCITEMENT

Support for the PET computer has been phenomenal in spite of Commodore's lack of commitment. And it will only get better. In the next months I will be giving you details on products and programs that already exist such as SPEECH. Yes, I have heard a PET say two complete sentences in perfectly clear English. I also have heard beautiful music in 4 voices. Plus I have seen excellent machine language programs such as a TRACE program. The PET is still only beginning to develop.

PET ACCESSORIES

I just have seen Midland Micronics (Oakfield House, Station Road, Dorridge, Solihull, W. Midlands, ENGLAND) announcement of their MM3 Mini Floppy Disc System. The dual drive sits on top of the PET with 1 drive on each side of the monitor. It looks as if the PET came that way. Price is 1300 POUNDS or 870 POUNDS for just a single drive.

For \$24.95 you can get a LIGHT PEN from 3G Company (Rt 3, Box 28A, Gaston, OR 97119) that plugs into your User Port.

Connecticut Microcomputer (150 Pocono Rd, Brookfield, Conn 06804) is marketing AIM16, 16 bit analog inputs for the PET. Uses include measurement, recording, or controlling of Temperature, pressure, humidity, and light. Prices begin at \$159.

Nestar Systems (810 Garland Dr, Palo Alto, CA 94303) have announced the Cluster/One System. It includes two IBM-compatible 8 inch diskettes holding up to 315,000 bytes each. This central unit (the Queen) can connect to up to 30 microcomputers. It originally supported the PET, and now allows both PETs and APPLE IIs to be connected. Prices begin at \$4500 and vary with options and configuration.

BEAUTIFUL MUSIC

Micro Technology Unlimited (PO Box 4596, 841 Galaxie Way, Manchester, NH 03108) is coming out with PET versions of their KIM music board and visible memory. You may see other companies copying their ideas, but M.T.U has the original creative minds working together. I have heard their music board in operation hooked up to a PET. The music was in 4 voices simultaneously and sounded just as good as the record. I was fortunate to also hear a PET speak a completely intelligible sentence using the M.T.U. system for output. The voice was real sounding - not at all tinny or electronic sounding. Of course the software needed to operate their music board is available from M.T.U. also.

Available end of MAY 1979.

PETSAVR

Connecticut Microcomputer (150 Pocono Rd, Brookfield, Conn 06804) has just announced their new product PETMOD also called PETS AVR. This unit plugs into your PET's IEEE and user ports. The PETS AVR has 1 user port and 2 IEEE edge connectors available to the user, as well as 1 port for use with their DAM SYSTEM 16 channel analog input module (AIM 16). If left plugged in, the PET user can plug and unplug his accessories and peripherals into the PETS AVR and save the original PET edge connectors from becoming worn down. Price is \$49.50. The first 100 people mentioning this announcement will receive a PETS AVR for only \$19.50. These 100 do not include the DAM port.

Commodore News

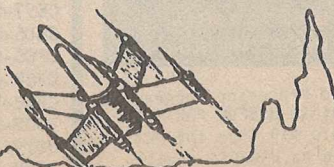
Chuck Peddle is back with Commodore. He left Commodore a while back to work with Apple. As original designer of the PET it is good to have him back. Commodore has had a large turn around in personnel. Many key people have left. Some are now making PET compatible products on their own. Bob Skyles is marketing large keyboards and memory expansion for the PET now. Greg Yob is writing his own PET user manual. The new management of Commodore is trying to give better service and support. With some tough competition from Atari and TI the PET may not survive without good service and support.

Commodore has now announced a full line of peripherals for the PET. Remember, these are only announcements. The PET 2001-16N Computer has 16K bytes of memory and a large keyboard with numeric pad and graphics on keys. Cassette is not included in the \$995 announced price. The PET 2001-16B is the same as above except has a standard typewriter keyboard and no graphic keys. Same price too. The PET 2001-32N is the same as the 16N but with 32 K memory. Price is \$1,195. The PET 2001-32B is the same as the 16B but with 32K memory. Price is \$1,195. The PET 2021 Printer is an 80 column dot matrix electrostatic printer with full graphics for \$549. The PET 2022 Printer is an 80 column dot matrix printer using plain paper with tractor feed and full graphics for \$995. The PET 2023 Printer is the same but without tractor feed for \$849. The PET 2040 Dual Drive Mini Floppy Disk can store 343K and sells for \$1095. It can not be attached to the original 8K PET without modification. The PET 2041 Single Drive Floppy Disk can store 171K and sells for \$595.

GROUP PROJECT

If your PET User Group would like a project that will allow members to help others and enjoy themselves at the same time this might be for you.

Contact your cities Hospital. Advise them of your willingness to help cheer up the children there. Your members could take turns visiting the children evenings, weekends, or whenever arrangements could be made. Of course they would bring along their PET. Soon the hospital will probably consider owning it's own PET. To make it easy to implement this project the PET GAZETTE (1929 Northport Dr, Room 6, Madison, WI 53704) offers a package of 6 games absolutely FREE if requested by your hospitals Volunteer Services Director on their letterhead. Request CHILDREN/HOSPITAL GAMES. Games may change but will probably include Blackjack, Hangman(sound), Chase(sound), Snake, Stars, and Tommy Termite. All are on AGFA tape ready to RUN. Please keep me informed of any projects your PET group may have.



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

ACP INC
1310 E Edinger
Santa Ana, CA 92705

ADDISON-WESLEY PUBLISHING
Reading, MA 01867

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

AMPTEC
5975 Broadway
Denver, CO 80216

APPARAT, INC
Box 10324
Denver, CO 80210

APPLICATIONS RESEARCH
13460 Robleda Rd
Los Altos Hills, CA 94022

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

AUTOMATED SIMULATIONS
PO Box 4232
Mountain View, CA 94040

AXECO INDUSTRIES
13304 87 NE
Kirkland, WA 98033

AXIOM CORP
5932 San Fernando Rd
Glendale, CA 91202

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

DO YOU WANT TO EDIT THE TEXT
INPUT FROM TAPE
OUTPUT TO TAPE
PRINT THE OUTPUT
HEAD TO SCREEN
or WRITE SOMETHING NEW?

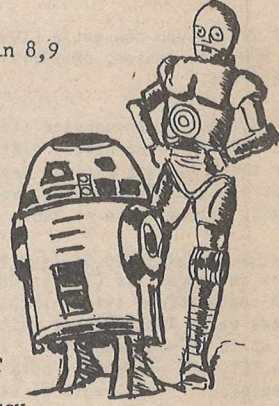
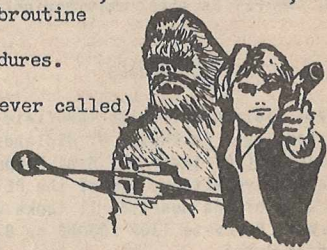
An excellent Word Processor Program is one of 6 programs in USEFUL PAK 1 available for only \$10 from the PET GAZETTE. Recorded on HIGHEST quality AGFA tape, programs are all guaranteed to load.

We were fortunate indeed to receive several articles from Jim Butterfield. Below is a list he compiled and sent to us of routines from PET BASIC.

A few routines from PET basic

F. J. BUTTERFIELD

- C2AC-C2D9 peeks at the stack for an active FOR loop
- C2AD-C31C 'opens up' a space in Basic for insertion of a new line.
- C31D-C329 tests for stack-too-deep and aborts if found.
- C32A-C356 check available memory space
- C357-C388 sends a canned error message from C190 area, then drops into:
- C389-C391 Signals 'ready'
- C394-C3A9 gets a line of input, analyzes it, executes it
- C3AC-C42E handles a new line ~~fr~~ of Basic from keyboard; deletes old line. etc.
- Ch30-Ch60 corrects the chaining between Basic lines after insert/delete
- Ch62-Ch76 receives a line from the keyboard into the Basic buffer
- Ch79-Ch8C gets each character from keyboard
- Ch8D-C521 looks up the keywords in an input lines and changes to "tokens"
- C522-C550 searches for the location of a Basic line from number in 8,9
- C551-C599 implements NEW command - clears everything
- C59A-C5A7 sets the Basic pointer to start-of-program
- C5A8-C64F performs LIST command
- C649-C68F executes a FOR statement
- C692-C6E4 continues to build ~~FOR~~ FOR vectors
- C6E5-C6EF reads and executes the next Basic statement, finds next line, etc.
- C6F2-C70A executes the Basic Command as a subroutine
- C70D-C71B performs RESTORE
- C71C-C742 handles STOP, END, and BREAK procedures.
- C745-C75E performs CONT
- C75F-C76D set pause after carriage return (never called)
- C770-C772 performs CLR
- C775-C77D performs RUN
- C780-C79A performs GOSUB
- C79D-C7C9 performs GOTO
- C7CA-C7FD performs RETURN
- C7FE-C81E scans for start of next Basic Line
- C820-C840 performs IF
- C843-C862 performs ON
- C863-C89A gets a fixed-point number from Basic and stores in 8,9
- C89D-C91B performs LET
- C91C-C97E check numeric digit/move string pointer
- C97F-C982 performs PRINT#
- C985-C996 performs CMD
- C999-CA24 performs PRINT
- CA27-CA41 prints ~~XXXXXX~~ string from address in Y,A
- CA44-CA76 prints a character
- CA77-CA9E handles bad input data
- CA9F-CAC5 performs GET
- CAC6-CADF performs INPUT#
- CAEO-CB14 performs INPUT
- CB17-CB21 prompts and receives the input
- CB24-CC11 performs READ
- CC12-CC35 canned messages: EXTRA IGNORED; REDO FROM START
- CC36-CC8F performs NEXT
- CC92-CCB5 checks Basic format, data type, flags TYPE MISMATCH
- CCB8-CD38 inputs and evaluates any expression (numeric or string)
- CD3a-CD9C pushes a partially-evaluated argument to the stack
- CD9D-CDB9 evaluates a numeric, variable, or pi, or identifies other symbol
- CDBC-CDEC value of pi in floating binary
- CDCl-CDE7 checks for special characters (+,-,",.) at start of expression
- CDE8-CDF6 performs NOT function
- PDF7-CE04 checks for various functions
- CE05 evaluates expression within parentheses ()
- CE0B checks for right parenthesis)
- CE0E checks for left parenthesis (
- CE11-CE1B checks for comma
- CE1C-CE20 prints SYNTAX ERROR and exits
- CE21-CE27 sets up function for future evaluation
- CE28-CE39 set up a variable name search
- CE3B-CE96 checks for special variables TI, TIS, and ST
- CE97-CED5 identifies and sets up function references
- CED6-CF05 perform the OR and AND functions
- CF06-CF6D performs comparisons
- CF6E-CF7A sets up DIM execution
- CF7B-DO0E searches for a Basic variable
- DO0F-DO78 creates a new Basic variable
- DO79-DO87 logs Basic variable location
- DO88-DO98 is array pointer subroutine
- DO99-DO9C is 32768 in floating binary



REVIEW-\$15-HOUSEHOLD FINANCE 1 & 2
Creative Software
P.O.Box 4030
Mountain View, Ca 94040
There wasn't enough time to actually use these programs. They are intended to record and analyze your household expenditures. There are 16 expense categories, auto, mortgage, clothes, entertainment, education, food, gifts, household, taxes, medical, insurance, utilities, vacation, savings, income, misc. You record in monthly data files. Now the analysis works I am uncertain until a lengthy example is tried, hopefully for the next GAZETTE. It looks like a useful program. -Bill Bendoritis

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 a 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 reconciliation 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.

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 explanation 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.

Dealer inquires invited.

Sawyer Software

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



RESOURCES

-Continued-



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

CALCULATOR/COMPUTER MAGAZINE
Box 310
Menlo Park, CA 94025

CAP ELECTRONICS/PET SOUND
1884 Shulman Ave
San Jose, CA 95124

CATALYST COMPUTER CENTER
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CGRS MICROTECH
PO Box 368
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Box 861-A
Valley Forge, PA 19481

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Floral Park, NY 11001

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790 Madison Ave
New York, NY 10021

COMPUTER FORUM
14052 E Firestone Blvd
Santa Fe Springs, CA 90670

-Continued-

D09D-D0B8 is floating point-to-fixed conversion for signed values
 D0B9-D263 locates and/or creates arrays
 D264-D277 performs FRE function
 D278-D284 converts fixed point-to-floating
 D285-D28A performs POS function
 D28B-D294 checks direct/indirect command, gives 'ILLEGAL DIRECT'
 D295-D348 executes DEF statements and evaluation FNx
 D349-D36A performs STR\$ function
 D36B-D3D1 scans and sets up string elements
 D3D2-D403 builds string vectors
 D404-D5C3 does 'garbage collection' - discards unwanted strings
 D5C4-D5D7 performs CHR\$ function
 D5D8-D653 performs LEFT\$, RIGHT\$, MID\$ functions
 D654-D662 performs LEN, gets string length
 D663-D672 performs ASC function
 D673-D684 gets a single-byte value from Basic
 D685-D6C3 evaluates VAL function
 D6C4-D6CF gets two arguments (16-bit and 8-bit) from Basic
 D6D0-D6E5 checks argument is in range 0-65535
 D6E6-D701 performs PEEK and POKE
 D702-D71D executes WAIT statement
 D71E-D890 performs addition and subtraction
 D891-D8BE contains floating-point constants
 98BF-D8FC performs LOG function
 D8FD-D95D performs multiplication
 D95E-D988 loads secondary accumulator from memory (\$B8 to \$BD)
 D989-D9B3 test and adjust primary/secondary accumulators
 D9B4-D9E0 routines to multiply or divide by 10
 D9E1-DA73 performs division
 DA74-DA98 loads primary accumulator from memory (\$B0-\$B5)
 CA99-DACD transfers primary accumulator to memory
 DACE-DADD transfers secondary accumulator to primary
 DADE-DAEC transfers primary accumulator to secondary
 EAED-EAFC rounds the primary accumulator
 DAFD-DB29 extracts primary sign; performs SGN function
 DB2A-DB2C performs ABS
 DB2D-DB6C compares primary accumulator to memory
 DB6D-DB9D Convert Floating point to fixed, unsigned
 DB9E-DBCh perform INT function
 DBC5-DC4F convert ASCII string to floating point
 DC50-DC84 get new ASCII digit
 DC94-DCAE print Basic Line number
 ECAF-DDE2 convert floating point to ASCII string (at 0100 up)
 DDE3-DE23 conversion constants - decimal or clock
 DE24-DE2D evaluation SQR function
 DE2E-DE66 evaluation of power function
 DE67-DE71 negate (monadic -)
 DEAO-DEF2 perform EXP function
 DEF3-DF3C perform function series evaluation
 DF45-DF9D perform RND calculation
 DF9E evaluate COS function
 DFA5-DFED evaluate SIN function
 DFEE-E019 evaluate TAN function
 E048-E077 evaluate ATN function
 E0B5-E0CC Basic scan program, transferred to 00C2-00D9
 E0D2-E173 completion of power-on-reset; memory test, etc.
 E19B-E1BB partial test for TI and TIS
 E1BC-E1E0 input/read/get director
 E1E1-E27C initialize I/O registers. clear screen, reset subroutine
 E27D-E3C3 receive input from keyboard/screen
 E3C4-E3E9 set up new screen line
 E3EA-E52F output character to screen
 E530-E5DA check for and perform screen scrolling
 E5DB-E66A start new screen line
 E66B-E67D interrupt entry
 E67E-E683 interrupt return
 E685-E73E hardware interrupt routine: cursor flash, tape motor.
 E73F-E7AE convert keyboard matrix to ASCII keyboard
 E7AC-E7B9 write-on-screen subroutine
 E7DE-E7EB print canned monitor message
 F0B6-F1CB IEEE-488 channel open, test, close
 F1CC-F22F get input character from keyboard, screen cassette, IEEE
 F230-F27C output character to screen, cassette, IEEE
 F27D-F2A3 restore normal I/O, clear IEEE channels
 F2A4-F2AA abort (not close!) all files
 F2AB-F2B7 locate logical file table entry
 F2B8-F2C7 transfer file table entries to Device, Command
 F2C8-F329 perform file CLOSE
 F32A-F33E test stop key

REVIEW - SEAWOLF
Creative Software
P.O.Box 4030
Mountain View
CA 94040

This is a graphic video type game for you video game freaks who blew all your money on your PET and couldn't afford a video game. You control a submarine shown on the bottom of the screen. You fire at different sized ships which zip across the top of the screen. You score points for the ships you hit, the smaller the score. You play against time. To make things tougher mines move back and forth between you and the ships which block your path to fire. It is a kids type game but it is very fast moving which makes it a little more challenging for you older folk. - By Bill Bendoritis

OSERO &
TIC-TAC-TOE
\$10
Creative
Software
PO Box 4030
Mountain View
CA 94040

OSERO- This is a board type game. It is played on an 8X8 grid. You and the PET each start out with two positions in the center of the board. You each take turns putting a man on the board in a manner which makes two of your men flank some of your opponents. The men you flank then become yours. The object is to have the most men on the board at the end of the game. The PET will play either easy or hard and does a good job of it. This is a challenging game. Tic-tac-toe: This program plays the game against you. The graphics are good. Other than that there is not much you can say. The program does what it intended. Something for the kids. - By Bill Bendoritis

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The PET® Gazette Spring '79 5

RESOURCES

-Continued-

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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 Waiialae Ave
Honolulu, HI 96816

COMPUTER TUTOR
317 Elm St
Helena, Ark 72342

COMPU-THINK
3260 Alpine Rd
Menlo Park, CA 94025
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

COMPUTRONIX
423 S Saginaw Rd
Midland, MI 48640

COOPER COMPUTING
Box 16082
Clayton, Missouri 63105

COYOTE ENTERPRISES
Box 101
Coyote, CA 95013

CPU SHOP
39 Pleasant St
Charlestown, MA 02129

CREATIVE COMPUTING
PO Box 789-M
Morristown, NJ 07960

CREATIVE SOFTWARE
PO Box 4030
Mountain View, CA 94040

CURSOR
Box 550
Goleta, CA 93017

D DADS RELIABLE SOFTWARE
1614 Norman Way
Madison, WI 53705

F33F-F345 test if direct/indirect command for suppressing file advice

- F346-F3FE perform file LOAD
- F3FF-F421 print "SEARCHING .. "
- F422-F432 print "LOADING .. " or "VERIFYING"
- F433-F461 get parameters for LOAD and SAVE
- F462-F494 perform IEEE sequences for LOAD, SAVE, and OPEN
- F495-F4BA search for specific tape header
- F4BB-F4D3 perform VERIFY
- F4D4-F529 get parameters for OPEN and CLOSE
- F52A-F5AD perform OPEN
- F5AE-F5E2 search for any tape header
- F5E3-F5EC clear tape buffer
- F5ED-F64C write tape header
- F64D-F666 get start & end addresses from tape header
- F667-F67C Set buffer start address
- F67D-F694 set tape buffer start and end pointers
- F695-F69D perform SYS command
- F69E-F71B perform SAVE
- F71C-F735 find unused secondary address
- F736-F78A update clock
- F78B-F7DB set input device
- F7DC-F82C set output device
- F82D-F83A bump tape buffer counter
- F83B-F85D wait for cassette PLAY switch
- F85E-F870 test cassette switch line
- F871-F87E wait for cassette RECORD and PLAY switches
- F87F-F8B8 read tape initiation routine
- F8B9-F8D1 write tape initiation routine
- F8D2-F912 complete tape read or write
- F913-F91D wait for I/O completion
- F91E-F92D test stop key and abort if necessary
- F92E-F953 subroutine to set tape read timing
- F95F-FBDB interrupt routine for tape read
- FBDC-FBE4 save memory pointer
- FBE5-FBEB set ST error flag
- FBEC-FBEF subroutine to count 8 serial bits per byte
- FC00-FC1B subroutine to write a bit to tape
- FC1C-FCFA interrupt 1 for tape write - entry at FC21
- FCFB-FD15 terminate I/O and restore normal vectors
- FD16-FD37 subroutine to set interrupt vector
- FD38-FD47 power-on reset entry; test for diagnostic
- FD48-FD7B diagnostic routine
- FD7C-FD8F checksum routine
- FD90-FD9A pointer advance subroutine
- FD9B-FFB1 diagnostic routines

- JUMP TABLE:
- FFCO OPEN
 - FFC3 CLOSE
 - FFC6 set input device
 - FFC9 set output device
 - FFCC restore normal I/O devices
 - FFCF input character (from screen)
 - FFD2 output character
 - FFD5 LOAD
 - FFD8 SAVE
 - FFDB VERIFY
 - FFDE SYS
 - FFE1 test stop key
 - FFE4 get character from keyboard buffer
 - FFE7 abort all I/O channels
 - FFEA update clock
 - FFED-FFFA turn off cassette motors
 - FFFA-FFFB NMI vector (mangled)
 - FFFC-FFFD reset vector
 - FFFE-FFFF interrupt vector



REVIEW - \$2 - 3D PLOT
Warren Swan
15933 S Grove Ave
Oak Forest, IL 60452

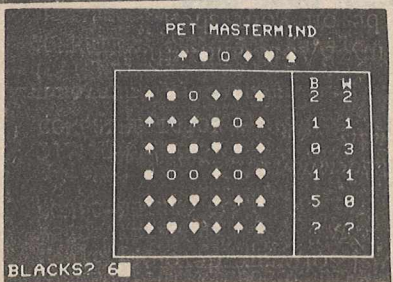
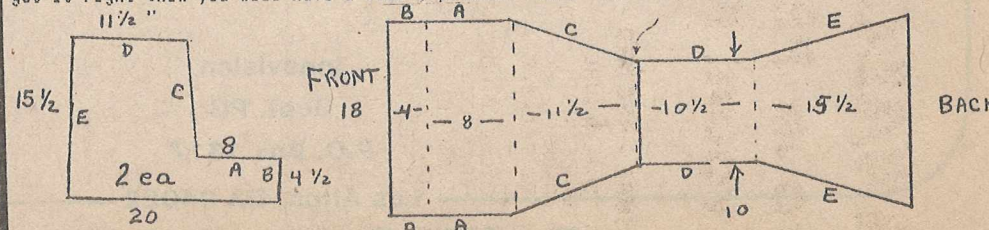
This program claims to simulate a 3-D plot on the PET's 2-D screen using the "high-resolution" graphics (80 x 50) available. Excitedly hoping to see a parabolic hyperboloid or hyperbolic ellipsoid appear before my eyes, I read the half-page of included documentation. I was instructed to define FNA in line 10 to whatever I wanted plotted. Well, as you know functions in PET BASIC are restricted to one input and one output parameter. Two dimensions (according to my last encounter with dimension theory) should be more than sufficient to plot a simple single-parameter function. Undaunted, I defined FNA(X)=4. This should simply give a line through 3-space, projected into 2-space on the screen. (True, it has been a year since I studied convex polytopes in any detail, but generalizing to my current pursuit of combinatorial topology, I find the same to be true.) To my great surprise, my little single-valued function gave an approximation of a circle drawn from parallel vertical bars. My simple continuous connected line (or 1-flat) in 3-space has been distorted into the interior of a 2-sphere disconnectedly! (Is there no continuity in projection mapping anymore? So long, Euclid, your fortress has further crumbled.) Those of you who find a need to take simple functions from a basic Euclidean metric space into some far region of 3-space and return in an unpredictable manner may find this program somewhat useful. The rest of us will wait for refinements.

- by Steve Kortendick

A SHOW OFF PET BLANKET

by Norman Parron

All you need are 3 pieces of clear plastic sheets, an iron, and a strip of aluminum foil. Cut the sheets of plastic as shown. Match the lettered sides and align them. Put the strip of foil over the edge, covering a 1/2 inch border. Apply the hot iron carefully and melt the edges together. This will be a bit difficult toward the end, but be patient and with care it will work out. After all the edges are melted together, turn the melted seam to the inside. If you got it right then you will have a clear, plastic "tent" the same shape as your PET.



MASTERMIND is one of the 6 programs featured in GAME PAK 1 available for \$10 from the PET GAZETTE. The PET can either make or break the codes (and can break your code extremely fast too).

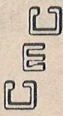
ANALOG INPUTS FOR YOUR PET YOUR KIM

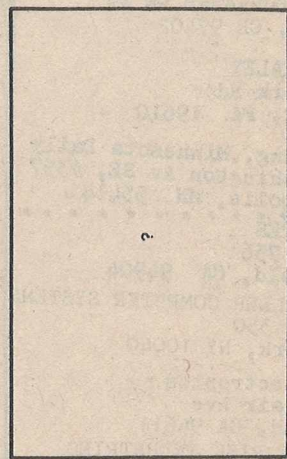
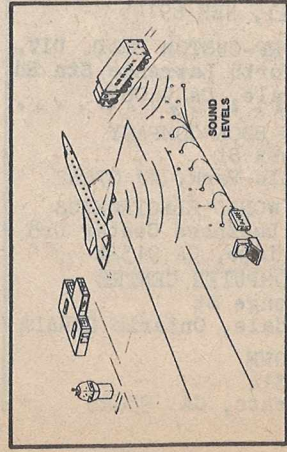
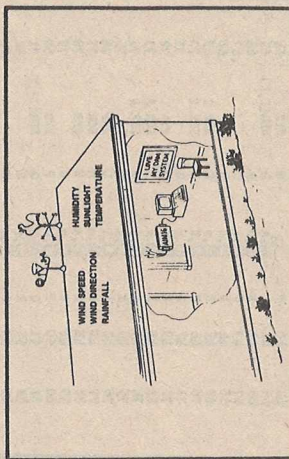
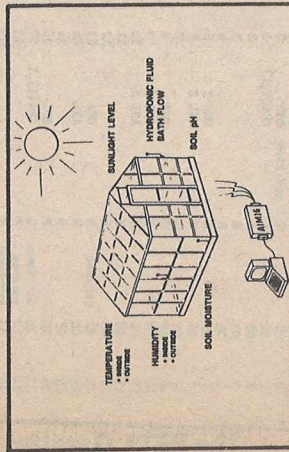
MEASURE - RECORD - CONTROL

- TEMPERATURE
- DIRECTION
- PRESSURE
- LIGHT LEVELS
- db
- POLLUTION CONTROLS
- DARKROOMS
- HUMIDITY
- LIGHT
- JOYSTICKS

- ENERGY CONSERVATION EQUIPMENT
- GREENHOUSES
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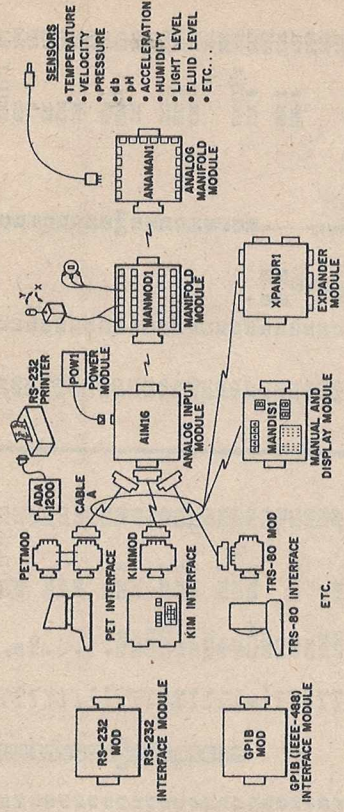
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DAM SYSTEMS by CMC
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Module Name	Description	Price
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AIM162	Analog Input Module - 16 bit analog inputs - 16 bit microcomputer conversion line - 32 pin connector - 16 bit control and one 8-bit connector input port for data	\$249.00
POM1	Power Module - Supplies power for one AIM16 module.	\$14.95
ICON	Input Connector - For connecting analog inputs to the AIM16 - 28 pin card edge connector - solder sockets.	\$9.95
OCOM	Output Connector - For connecting the AIM16 to a computer - 28 pin card edge connector - solder sockets.	\$9.95
MANIMOD1	Manifold Module - Use in place of IMOD. Screw terminal header strips for connecting solenoids, potentiometers, outside sensors etc. Eliminates the need for soldering. Plus into the AIM16.	\$59.95
ANAMANI	Analog Manifold Module - Use in place of IMOD. Connects DAM SYSTEMS SENSORS to the AIM16 without soldering - sensor cables just plug in. Plus into the AIM16 or the IMOD1.	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 COM1. Eliminates the need for soldering or special construction.	TBA
PETMOD	PET Interface Module - Gives the IEEE ports, one user port, and one DAM SYSTEMS circuit board. Also called the PETIMOD.	\$49.95
AIM161 Starter Set	Includes one AIM161, one IMOD, and one COM1.	\$189.00
AIM162 Starter Set	Includes one AIM162, one IMOD, and one COM1.	\$259.00
PETSET1a	Includes one PETMOD, one CABLE R24, one AIM161, one POM1, and one IMOD1.	\$295.00
KIMSET1a	Includes one KIMMOD, one CABLE R24, one AIM161, one POM1, and one IMOD1.	\$285.00
KIMMOD	KIM Interface Module - Connects computer interface to AIM16. MANDIST1, XPMOD1, etc.	\$59.95
CABLE "A"	Interconnect Cables - Connects computer interface to AIM16. MANDIST1, XPMOD1, etc.	TBA
CABLE A24	Interconnect Cable - 24 inch cable with interface connector on one end and an COM1 equivalent on the other.	\$19.95
MANDIST1	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 - Connects between the AIM16 and the computer interface. Allows the DAM SYSTEMS modules to be used with the GPIB bus instead of a computer's other I/O ports.	TBA
RS232 MOD	RS232 Interface Module - Allows the DAM SYSTEMS MODULES to be used with an RS-232 port or terminal.	TBA
XPANDR1	Expander Module - Allows up to 128 8-bit analog inputs (8 AIM16 modules) to be connected to one system.	TBA

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-Continued-



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Twinsburg, OH 44087

EXCEL CO
PO Box 1147
El Cerrito, CA 94530



FANTASY GAMES SOFTWARE
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FOREMAN
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Minneapolis, MN 55414



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Kentfield, CA 94904

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906 Blair Ave
Oakland, CA 94611
GEORGE RISK INDUSTRIES
GRI Plaza
Kimball, NEB 69145

GRT CORP-CUSTOM PROD. DIV.
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Sunnyvale, CA 94086



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Rochelle Park, NJ 07662

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Northridge, CA 91324

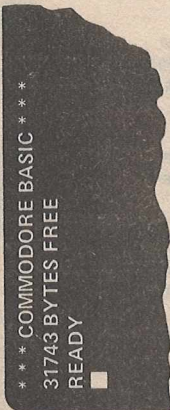
HOME COMPUTER CENTRE
6101 Yonge St
Willowdale, Ontario CANADA

DAVE HOWE
Box 28314
Sacramento, CA 95828

DECIMAL	HEX	ASCII	SCREEN	BASIC	6502	DECIMAL
0	01	1	space	space	ORA Z	1
1	02	2	space	space	ASL Z	2
2	03	3	space	space	PHI	3
3	04	4	space	space	ORA #	4
4	05	5	space	space	ASL A	5
5	06	6	space	space	ORA	6
6	07	7	space	space	ASL	7
7	08	8	space	space	ORA (I)	8
8	09	9	space	space	ORA (I)	9
9	0A	10	space	space	ORA Z	10
10	0B	11	space	space	ASL Z	11
11	0C	12	space	space	ORA	12
12	0D	13	space	space	ASL	13
13	0E	14	space	space	ORA	14
14	0F	15	space	space	ASL	15
15	10	16	space	space	ORA (I)	16
16	11	17	space	space	ORA (I)	17
17	12	18	space	space	ORA Z	18
18	13	19	space	space	ASL Z	19
19	14	20	space	space	ORA	20
20	15	21	space	space	ASL	21
21	16	22	space	space	ORA	22
22	17	23	space	space	ASL	23
23	18	24	space	space	ORA	24
24	19	25	space	space	ASL	25
25	1A	26	space	space	ORA	26
26	1B	27	space	space	ASL	27
27	1C	28	space	space	ORA	28
28	1D	29	space	space	ASL	29
29	1E	30	space	space	ORA	30
30	1F	31	space	space	ASL	31
31	20	32	space	space	ORA	32
32	21	33	space	space	ASL	33
33	22	34	space	space	ORA	34
34	23	35	space	space	ASL	35
35	24	36	space	space	ORA	36
36	25	37	space	space	ASL	37
37	26	38	space	space	ORA	38
38	27	39	space	space	ASL	39
39	28	40	space	space	ORA	40
40	29	41	space	space	ASL	41
41	2A	42	space	space	ORA	42
42	2B	43	space	space	ASL	43
43	2C	44	space	space	ORA	44
44	2D	45	space	space	ASL	45
45	2E	46	space	space	ORA	46
46	2F	47	space	space	ASL	47
47	30	48	space	space	ORA	48
48	31	49	space	space	ASL	49
49	32	50	space	space	ORA	50
50	33	51	space	space	ASL	51
51	34	52	space	space	ORA	52
52	35	53	space	space	ASL	53
53	36	54	space	space	ORA	54
54	37	55	space	space	ASL	55
55	38	56	space	space	ORA	56
56	39	57	space	space	ASL	57
57	3A	58	space	space	ORA	58
58	3B	59	space	space	ASL	59
59	3C	60	space	space	ORA	60
60	3D	61	space	space	ASL	61
61	3E	62	space	space	ORA	62
62	3F	63	space	space	ASL	63

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.

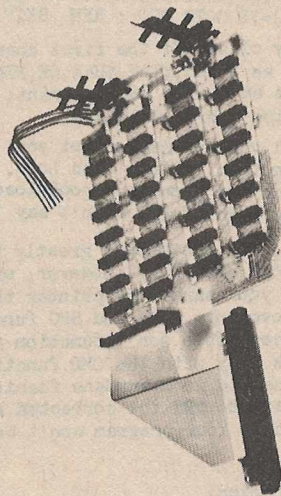


Skyles Memory Expansion Systems are complete; nothing more to buy. • First quality static RAMs • Solid soldered on first quality glass epoxy board • Separate PET Adapter Printed Circuit Board connects directly to data bus on your PET — no rat's nest of hanging hand-wiring • Ribbon cable and 50 pin connectors that keep your PET open to the outside world (one on the 8KB; two on the 16KB and 24KB).

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regular cost	8.50	74KB Big KeyBoard shipping & handling
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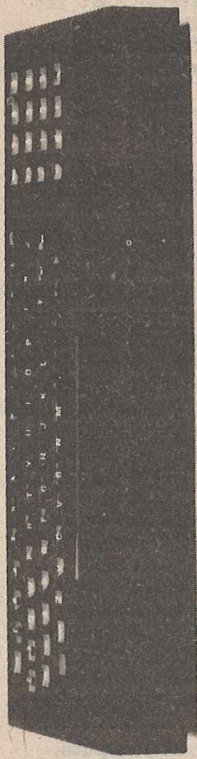
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YOU HAVE 27 HORSES. CAPTAIN KANGAROO
AND SNOOPY HAS 81 ...
BUT POOR DONALD DUCK DOESN'T HAVE ANY.
IF YOU AND SNOOPY SHARE WHAT YOU
HAVE EQUALLY WITH DONALD DUCK, HOW MANY
HORSES WILL EACH OF YOU HAVE? 29
SORRY, CAPTAIN KANGAROO. ~~IF YOU~~
YOUR ANSWER (NO GUESSING!)? 24
STILL WRONG... THE ANSWER IS 36
27 HORSES + 81 HORSES = 108 HORSES!
108 HORSES DIVIDED BY 3 = 36
PRESS ANY KEY FOR NEXT PROBLEM.....

Idle thoughts while leafing through the Gazette. .

by Jim Butterfield

Sometimes it's nice to do things in "pure" Basic (whatever that is) instead of POKE-ing to various memory locations. Either method is OK, really; but sometimes Basic is more readable (and perhaps more portable to other machines) when you leave out special machine gimmicks.

TO AVOID UNWANTED KEYBOARD STROKES: Just before your input/get statement, type something like:

```
350 GET Z$: IF Z$<" " GOTO 350
```



The keyboard buffer will be neatly emptied.

TO AVOID AN INADVERTANT RETURN STOPPING THE PROGRAM: As part of your INPUT prompt, end with the following: [2CURSOR-RIGHT,ANY-GRAPHICS-CHARACTER, 3CURSOR-LEFT]. This will cause the graphics character to appear to the right of the question mark, under the flashing cursor. If you hit RETURN, the graphics character will be seen as your input. If you type anything else, you'll overwrite the graphics character and your input will take place normally. My favorite graphics character for this is shift-question mark; this gives a "wig-wag" effect on the screen. You can also put a "default" value instead of a graphics, so that if the user presses RETURN, the value (usually zero) will be accepted.

TI and TI\$ read the same clock. This clock resets at 24 hours, or 5.184,000 jiffies. There seems to be little chance that you'll use the clock for timing an event during ~~clock~~ clock reset. Don't forget, however, that your program might perform a timing event thousands of times; with each use, the odds start to mount up against you. Easiest methods of avoiding these problems ~~is~~ are any of: (i) reset TI\$="000000" before use; (ii) use a FOR/NEXT loop for delay timing and don't bother with the clock; (iii) test to see if the clock is near maximum, and if so, wait for it to reset before using.

I'm not an unreserved fan of using GET statements for user inputs. Too many users automatically reach over and hit RETURN after their input, which may give problems later. Then again, it's nice to give the user a chance to change his mind before completing his input. If you do want to judge a response by the first character only (anything starting with N means NO, anything else means YES), my favorite method is:

```
100 INPUT "DO YOU WANT INSTRUCTIONS";X$  
110 IF ASC(X$)=78 GOTO 200 : REM SKIP INSTRUCTIONS
```

The ASC function neatly clips off the first character for you to examine. Replies such as Y,YES,YEAH,SURE,OK,FINE,WH?, and DUHHH will cause instructions at 120 to 190 to print; and N,NO,NOPE,NAAH, NYET, and NEVER will give a branch to 200.

Don't trust PET to tell you whether or not your program loaded correctly from cassette tape. After each Load, when PET replies READY, type ?ST. A reply of Ø means a good load. Anything else means your load is bad, even if PET didn't say ?LOAD ERROR.

Graphics are great fun, and contribute greatly to an attractive screen display. Consider carefully, however, which of your programs you'd like to adapt to your hard-copy printer that you'll buy any day now. Screen POKEs, cursor movements, TAB and SPC functions work fine on the PET display; but they often don't function right on a printer. Connecting a printer is easy with the CMD function, but - your program will have to operate in a mundane fashion. Use conventional PRINT statements; substitute ~~SPC~~ the correct number of printed spaces for SPC and TAB commands. Your program won't be as flashy, but it will print nicely.

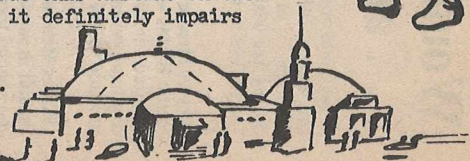
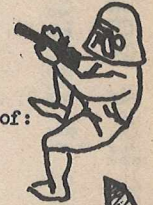
Caution to amateur mechanics.

If you do try taking things apart on your PET, be careful.

In particular: be absolutely sure that the power cable is properly re-connected. It's possible to put it back on so that all the pins are "one over" from their proper place.

I talked to an unfortunate PET owner who made this mistake on the power connector recently. He reports that it definitely impairs proper operation of the PET.

For one thing, the smoke gets in your eyes.



Above is STORY PROBLEMS from Educational PAK 1 from PET GAZETTE, 6 programs for \$10.



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Print Suppression: How does it work?

The "Len-Lindsay-five-pi" print suppression is something novel, and works very nicely (see BEST OF THE PET GAZETTE pg 60).

It works, not for any single reason, but because different parts of the Basic interpreter and Pet monitor treat it in different ways.

- (1) Each line of Basic code is stored in memory in the following fashion:
 - the first two bytes point to the next line of Basic;
 - the next two bytes give the Basic line number in binary;
 - the line of Basic follows; it may be any length but will normally be less than 80 characters;
 - a zero stored in memory signals the end of this Basic line.
- (2) The first two bytes are called a "chain" - since they point to the next line, they allow Basic to be searched rapidly for a specific line. For example, on a GOTO 1270, the PET doesn't need to search every byte of memory to find line 1270; it skips along the chain, picking up each line number and leapfrogging to the next line if it hasn't reached 1270 yet.
- (2) The Basic LIST command happens to work as follows:
 - it stops listing a line when it sees zero;
 - then it follows the chain to find the next line.By inserting a "false" zero at the beginning of the line, the LIST command stops immediately, and shows only the line number. Then it hops along the chain to the next line.
- (3) When Basic executes statements (during RUN), it works as follows:
 - it stops executing code when it sees zero;
 - it jumps behind the zero, picks up the next four bytes (as if they were chain and line number), and continues program execution.Note that Basic execution does not follow the chain; it just skips past the zero and four more bytes, and continues.
- (4) So ... Basic executes the stuff we have hidden behind the zero; but LIST jumps right past it.
- (5) There's one more complication, however. When you add or delete program lines, and when you LOAD a program, the PET monitor rebuilds the chain, linking each line to the next one following. Why, then, do the hidden lines not reappear after this activity?

Another (amazing!) coincidence. When Basic re-builds the chain it searches for the end-of-line zero, and links the chain to the point right behind it. But - it never imagines that a line could start with zero (that would be a none-line), so it doesn't test the first byte of the line; it starts at byte 2. It never sees the line-hiding zero at the start.

If you think you can follow what's happening above, try your hand at some of the following:

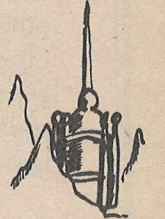
- A. Try putting a deliberate syntax error into a line, and then hiding it. Run the program. Can you explain where the peculiar line number comes from on the error statement?
- B. Almost anything can go into the four bytes following the zero. The original suggested pi, which stores as 255. Can you think of any value which is forbidden? Why?
- C. Similar to question B. Why can't you use this technique to hide part of a line, i.e., let part of it print and then turn the rest off?
- D. Can you think of any reasons why the LIST command will often cause PET to crash if used after an aborted LOAD?

REVIEW - \$10 - WUMPUS & CAPITALS

Creative Software, PO Box 4030, Mountain View, CA 94040

WUMPUS-This is a standard version of the hunting simulation game which has been around for a long time. You start out on the surface, your objective is to blindly feel your way through a honey comb of caves looking for a Wumpus. You must then shoot the Wumpus and find your way back out. There are hazards along the way such as bats and bottomless pits. It is an enjoyable game for both young and old.

CAPITALS-This program is a quiz game to help someone trying to learn the Canadian and U.S. state capitals. You are given points for correct answers, and deductions for having to ask the PET for the answer. It will give you a number of tries each time giving you a hint by showing you a letter in the name. This is a nice version of this learning program. - By Bill Bendoritis





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-Continued-

REVIEW - MAIL LIST - \$13 - DR DALEY
425 Grove Ave. Berrien Springs, MI 49103

This program has several features - all available thru a MENU screen: 1:Input new addresses from keyboard 2:Output to printer 3:Sort from tape 4:Save to tape 5:Input from tape 6:Display on screen 7:Edit the file. Using a menu screen is a good way to allow the user to transfer from one function to another. The EDIT feature is easy to use and the SORT mode allows you to choose your sort fields: name, number, company, address, city, state, or zip. This program handles approximately 29 names at one time (due to memory limitation) This is an easy to use program, however, there are several things that did cause me problems: The SORT feature expects to read the addresses from tape input. If you have entered addresses via keyboard and then hit the SORT request on the menu, the program asks for an input tape and there's no way to return to the menu (you could lose all of the addresses you just entered!) You could Save and then Sort. After entering addresses, if you go to DISPLAY on screen, then return to Menu, and go to enter more addresses, everything you previously entered is gone!!

Dr Daley has a DISK version for the PET too.

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REVIEW - \$10 - COMPU SCAN
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This short program allows you to add addresses, and print on a printer. There is no sort, edit, or display on screen feature. The program takes the data you enter and generates Basic DATA statements. When you end the program, it does an automatic SAVE of the program (including the addresses you entered-now stored as DATA in the program) No easy way to correct mistakes; mistakes not easily seen as there is no display function (except to LIST DATA statements) However, this is a good example of a "quick & easy" program - nothing fancy but it gets the job done! There is a MENU screen that allows you to add addresses, print to printer, or end the program. When you print the addresses you can select all to print or by a code which was assigned when you entered the address.

REVIEW - TRAP & TRAPSHOOT
Creative Software
P.O.Box 4030

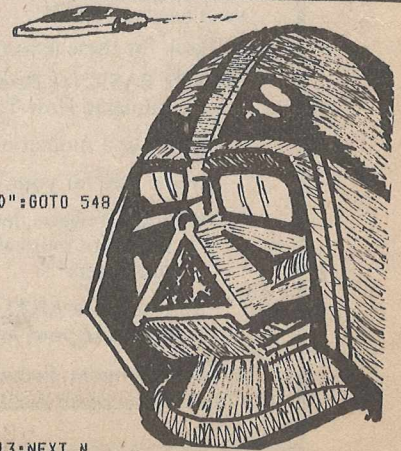
Mountain View, Ca 94040

These programs are part of the dual joystick package from Creative Software. TRAP is a well know game also known as Snake, Wraptrap, and Blockade. The object is to control your line so as to force you opponent into a line or wall. You can play against another player or the PET. Many people will probably find using joysticks alot easier than the keyboard.

TRAPSHOOT- In this game each player controls a gun on opposite sides of the screen. You each control a part of the screen part jointly, part exclusively. There are also some barricads. A target flashes quickly up the screen and you attempt to hit it. If you hit your opponent you loose points. It is a decent video type game. Both these programs are for joysticks only. - By Bill Bendoritis

```

500 PRINT "CLRLJHL TO BASIC PROGRAMMER"
502 PRINT:PRINT "THIS PROGRAM GENERATES A BASIC PROGRAM"
504 PRINT "WHICH LOADS A MACHINE LANGUAGE ROUTINE":PRINT
506 REM BY H. SHERMAN (JAN, 1979)
508 REM 8140 N GRANDVIEW DR
510 REM BROWN DEER, WISC 53223
512 INPUT "STARTING LOCATION":L1
514 INPUT "ENDING LOCATION":L2
516 IF L2<=L1 THEN 500
518 PRINT "CLRLJ 2 DOWN]"
520 PRINT "20FORI=":L1:"TO":L2:"READD:POKEI,DC:NEXTI"
522 PRINT "L1=":L1:"L2=":L2:"GOTO528"
524 POKE 525,10:FOR N=0 TO 9:POKE 527+N,13:NEXT N
526 PRINT "[HOME]":END
528 ML=L1:LN=22
530 PRINT "CLRLJ 2 DOWN]"
532 PRINT LN:"DATA";
534 D1=PEEK(ML):D1$=STR$(D1)
536 DC$=RIGHT$(D1$,LEN(D1$)-1)
538 PRINT DC$:ML=ML+1
540 IF POS(0)<36 THEN 544
542 PRINT:PRINT "LN=":LN:"+2:ML=":ML:"L2=":L2:"GOTO530":GOTO 548
544 IF ML>L2 THEN PRINT:PRINT "GOTO554":GOTO 548
546 PRINT CHR$(44):GOTO 534
548 PRINT "[HOME]"
550 POKE 525,10:FOR N=0 TO 9:POKE 527+N,13:NEXT N
552 PRINT "[HOME]":END
554 I=500:J=502:K=504
556 REM
558 REM
560 PRINT "CLRLJ 2 DOWN]":PRINT I:PRINT J:PRINT K
562 PRINT "I=":I+6:"J=":J+6:"K=":K+6:"GOTO560"
564 PRINT "[HOME]":POKE 525,10:FOR N=0 TO 9:POKE 527+N,13:NEXT N
    
```



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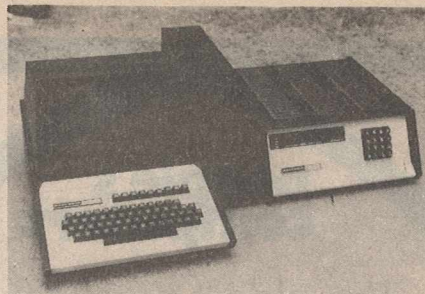
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Calendaring is just one of the many high quality features you'll find in Creative Computing Software cassettes. We could have purchased cassettes for half the price that would have worked, but we wanted to be sure that our cassettes would last for years and would give you an error-free program load every time.

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PET (8K) Software

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CS-1002. Number Games-1. Six number logic games including **Guess** in which you guess a secret number. **23-Matches**—try not to take the last match. **Letter** in which you guess a secret letter. **Number**, a random jackpot game. **Trap** in which you trap a mystery number between two trap numbers. **Stars** gives you stars as clues to the secret number. \$7.95.

CS-1201. Sensational Simulations-1. Five super simulations including the popular **Animal** in which the computer learns animals from you. **Fur Trader** lets you trade furs in old Canada. **Hammurabi** in which you manage the city-state of Sumeria. Or try making your fortune in the **Stock Market**. A logic game, **Word**, has you guess secret words. \$7.95.

CS-1003. Logic Games-2. Six challenging puzzles including **Rotate**, in which you order a matrix of random letters. **Strike-9**, try to remove all nine digits without striking out. The classic number game, **NIM**. In **Even-Wins** try to take an even number of chips. **Hi-Lo**, a number guessing game with a jackpot. **Batnum**, the super "battle of numbers!" \$7.95.

CS-1004. Graphics Games-1. Five amazing realtime graphics games designed especially for your PET. In **Chase**, one player pursues the other through a maze of obstacles and "zap doors." **Escape**—attempt to escape from a prison patrolled by robot guards. **Dart** provides arithmetic drill and indicates how close your response is to the correct answer on a dart board. In **Snoopy** you compute distances on a number-line while trying to shoot down the Red Baron. In **Sweep** you must try to hit nine targets in order by controlling the path of a cannonball. \$7.95.

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CS-1006. Conversational Games-1. Talk to **ELIZA**, the computerized psychoanalysis program. Compose poetry with **Halku**. Challenge your vocabulary and word-guessing skills with **Hangman**. **Hurkle**, try to find the hurkle on the 10 by 10 grid in five moves. In **Hexletter**, you compete to capture more letters on a hexagon than your opponent. \$7.95.

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TRACE

Trace is a machine language program that is designed to run at the same time as your BASIC program. Trace uses the top two lines of the PET video display. It continually lists the line number and command that the PET currently is executing. You can read the lines of your program as they are executing since TRACE slows your BASIC program down. Thus you can see when the program branches and gets caught in a loop. Simply press the shift key and ZZZIPPP the program is running fast again. This allows you to skip quickly over the sections you know are functioning correctly. Trace is excellent for debugging your own programs as well as watching how other programs function. Bret Butler did a fine job with this program. He has graciously placed it in public domain.

```
10 PRINT"CLRLR] TRACE BY BUTLER
11 PRINT"RAY RUN SIMULTANEOUSLY WITH
12 PRINT"A BASIC PROGRAM"
13 PRINT"SYS(7868) TURNS TRACE ON"
14 PRINT"SYS(7853) DISABLES TRACE"
16 PRINT"HOLD SHIFT KEY DOWN TO SPEED IT UP
18 PRINT"CHANGE TRACE SPEED WITH POKE 7972,X
20 FORI= 7853 TO 8192 :READDC:POKEI,DC:NEXTI
22 DATA162,5,189,181,224,149,194,202
24 DATA16,248,169,239,133,210,96,169
26 DATA172,133,134,169,30,133,135,169
28 DATA255,133,124,160,0,162,3,134,125
30 DATA162,3,32,239,30,208,249,202,208
32 DATA248,32,239,30,32,239,30,162,5
34 DATA189,249,31,149,194,202,16,248
36 DATA169,242,133,210,76,106,197,230
38 DATA124,208,2,230,125,177,124,96
40 DATA230,201,208,2,230,202,96,32,197
42 DATA0,8,72,133,79,138,72,152,72,166
44 DATA137,165,136,197,77,208,4,228
46 DATA78,240,107,133,77,133,82,134
48 DATA78,134,83,173,4,2,208,14,169
50 DATA3,133,74,202,208,253,136,208
52 DATA250,198,74,16,246,32,201,31,169
54 DATA160,160,80,153,255,127,136,208
56 DATA250,132,76,132,84,132,85,132
58 DATA86,120,248,160,15,6,82,38,83
60 DATA162,253,181,87,117,87,149,87
62 DATA232,48,247,136,16,238,216,88
64 DATA162,2,169,48,133,89,134,88,181
66 DATA84,72,74,74,74,74,32,211,31,104
68 DATA41,15,32,211,31,166,88,202,16
70 DATA233,32,217,31,32,217,31,165,75
72 DATA197,201,240,55,165,79,208,4,133
74 DATA77,240,47,16,42,201,255,208,8
76 DATA169,94,32,225,31,24,144,33,41
78 DATA127,170,160,0,185,145,192,48
80 DATA3,200,208,248,200,202,16,244
82 DATA185,145,192,48,6,32,223,31,200
84 DATA208,245,41,127,32,223,31,165
86 DATA201,133,75,104,168,104,170,104
88 DATA40,96,168,173,64,232,41,32,208
90 DATA249,152,96,9,48,197,89,208,4
92 DATA169,32,208,2,198,89,41,63,9,128
94 DATA132,81,32,201,31,164,76,153,0
96 DATA128,192,79,208,2,160,7,200,132
98 DATA76,164,81,96,76,255,30,32,248
100 DATA30,55,32
```

REVIEW

TYCOM ASSOCIATES
programs \$7.95 each
68 Velma Ave
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MAX - it's you vs the PET in a game of "Liars Dice". You and the PET take turns "rolling the dice" and making a claim. (each claim must be higher than the previous claim-so you may have to lie a little) You may chose to challenge your opponent rather than rolling. If he lied, he loses a point. If he had what he claimed you get the point. First to get 10 points loses. The PET is VERY tough to beat. This is a fun game! Comes with a typewritten page explaining rules and a rank listing of the possible rolls.

FOOTBALL - One or two may play. You choose the degree of difficulty (wide or narrow field). When on offense you try to guide your runner around the defensive players which are chasing him. If close enough you can even kick field goals. PET has a clock to keep track of the quarters (and delay of game penalty) This is a good attempt at making computer football more fun, but I have yet to find a version that I would play more than 1 or 2 times.

HORSERACE - This is a fun & addictive game! From 1 to 5 "bettors" can play. Each player starts with \$100. In each race there are 8 horses with various (random) payoff odds. Each player places a bet on the nag of his choice and whether it will win, place, or show. Then the race is on! With the "horses" galloping down the straight-a-way - changing positions at every move. There are PHOTO finishes and after the race, the official payoff board is displayed. This is a good party game.

BATTLESHIP - You vs the PET. Sink his ships before he sinks yours. Each side has a 4 unit aircraft carrier, a 3 unit battleship, and a 2 unit destroyer. You decide where in the 10 x 10 grid to place your ships and the battle is on. The PET keeps track of the hits and misses. - BILL COUGHLIN

Someone sent us the sign below

ACHTUNG!

Alles Lookenspeepers

DAS COMPUTENMACHINE IS NICHT FÜR GE-FINGERPOKEN UND MITTENGGRABEN. IST EASY SCHNAPPEN DER SPRINGENWERK, BLOWENFUSEN, UND POPPENCORKEN MIT SPITZENSPARKEN.

IST NICHT FÜR GERWERKEN BY DAS DUMMKÖPFEN. DAS RUBBERNECKEN SICHTSEEREN KEEPEN HANDS IN DAS POCKETS-RELAXEN UND WATCH DAS BLINKENLIGHTS.

REVIEW - METRI CALC - \$7.95 - Micro Software Systems, PO Box 1442, Woodbridge, VA 22193
Metri-Calc is a calculator program that is designed to do two things: reverse Polish notation calculator and good METRIC to ENGLISH/ ENGLISH to METRIC conversions. The calculator is unique in that it shows us the contents of the stack on the screen. It provides 20 levels in the stack and twenty addressable memory locations. We are able to see our problem working right on the screen. The four math functions are used in the normal PET way. The numbers are entered in the stack and nunerated last in first acted on. THIS PART of the program in itself will turn your PET into an every day accessory. All sin, cos, tan and arc functions are built in as well as pi, e^x, 10^x, N! and more, all displayed for you on the screen. The METCIC to ENGLISH and ENGLISH to METRIC systems are being used more everyday and here is a good chance to see them in a well presented form. Any number of the following can be converted: length, area, volume, temperature, weight, radians to degrees and square miles to square kilometers. I had no problem in loading, the instructions are clear and the program works. It is printed in lower case and for \$7.95 is well spent for METRICS alone. - by John H. Kinast

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INSTALLING A SECOND KEYBOARD


Jim Strasma c/o 120 W. King St.
Decatur, IL 62521

The "SPOT" article in the Nov./Dec. issue of PEOPLES' COMPUTERS (now RECREATIONAL COMPUTING) told how to install a second keyboard in parallel with the original one on the PET, so both may both used together. Randall Julin, who submitted the article, offered additional help to those intending to try this project. His address is: 15 Poncetta Drive #322 Daly City, CA 94015, phone: (415) 992-6946 home, 469-1157 work.

Briefly, I read the article, wrote Mr. Julin, received a VERY nice several page xerox letter in reply, promptly and for free! Then I did nothing, not quite understanding the instructions, and not quite ready to do anything permanent to change my PET from "stock" condition. But the announcement that the new PET models will have a "real" keyboard, and will not be compatible with present PET tapes was enough to nudge me into action. I ordered the JAMECO unencoded 63 key keyboard as Mr. Julin suggested, bent a piece of acrylic into a suitable enclosure, and added a second keyboard that looks almost like the one NEECO is now advertising. The cost was about double the \$30 price of the keyboard, but I'm sure many of you can do it for less than I did. The time involved was about 15 hours of work. Thus the idea is best for those with more time than money, as an assembled second keyboard is now \$125-140 if available.

I won't duplicate what PEOPLES' and Mr. Julin can tell you. But I will add my own hints to theirs. First, order the keyboard from JAMECO ELECTRONICS at 1021 Howard Avenue in San Carlos, CA 94070. They don't take charges, but I received mine in Illinois in less than a week after ordering, via UPS. The total cost, including shipping is \$32.20 Also right away, write Mr. Julin and ask for his construction hints. I think it would be kind to enclose some stamps to cover his xerox costs. If many write, that could get expensive. When the board arrives, be VERY careful of the little wire wrap connections on the bottom side. Despite Mr. Julin's warning, I broke one, and had to dig into the plastic for a place to solder that connection. (If you have this problem, a red-hot metal stylus digs easily.)

Now you are ready to begin. Other supplies you will need will be wire wrap tool and about 70 feet of wire wrap wire, soldering iron with a fine point, tweezers, a ribbon cable with IC socket connectors (male) at each end, a matching IC socket. I got all this at Radio Shack, which is a high price way to go. (Jameco offers a suitable 24 conductor ribbon cable with connectors (labeled Dip Jumper #DJ24-1-24 for \$5.20) The RS one is only 16 conductor and 18 are needed, but I didn't order the Jameco one. Take your choice. Or skip both and hard wire directly from the new keyboard to the present one. (You'll still need a terminal strip or something to hold the forest of wires from the keyboard until you're ready to wire into PET, and the socket would allow you to unplug the second board so it will fit back in the shipping carton if that becomes necessary.)

First, move some of the keytops around on the new board. They pop off, but use a narrow screwdriver to be sure that they separate just at the bottom of the keytop rather than at the bottom of the post. If the post pops out, so does a spring, and you may bend a contact putting it back. (I did.) I suggest you move these keytops: ESC, from upper left corner to upper right one position to the left of the corner; DELETE, from right end of row two to right end of row one (upper right corner); LINE FEED one position to the right, where DELETE was; BACKSPACE to replace LINE FEED; REPEAT to upper left corner where ESC was (unused); BLANK at lower left corner to where REPEAT was at lower right;  BAK from upper right corner to lower left corner, where the blank was

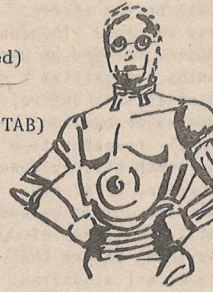
This will give you your cursor control keys at the upper right, with the arithmetic operators near them, the number keys in the top row, as on a typewriter, and the regular keys in normal positions. You will need some dark gray and some white model airplane paint too, to color over the characters you won't have, and indicate the new functions on four keys. These are:
TAB, which will become "\$";
the brackets key to the left of RETURN, which will become "'";
and the two blank keys, which will be "(" and ")"

Each key will be connected to two wires, a numbered supply line, and a lettered return line. These are explained by the above sources. All the keys that have the same letter are wired together; all those with the same number are likewise wired together. Do this by wrapping the wire around each post in turn 2 times, heating it enough to melt the insulation, and applying a bit of solder to hold it. (Be sure the insulation melts; three of mine didn't the first time around.) If you are using the socket and ribbon idea, wire one end of each supply and return line to a pin on the cable. I found it helped to epoxy glue the connector on one end right to the keyboard to hold it for soldering and later. When you are done wiring, use a continuity tester to see if the keys really are connected to the right lines. Do this by applying power to the correct supply line for a key, ground the correct return line, and see if pushing that key makes or breaks a circuit. I used my VOM for this. This step will show up any faulty connections, or mis-wiring. (Yes, I had two keys on the wrong lines.)



I hope all this won't scare you off; I am not a hardware type. I did this project with a \$3 soldering iron I use less than once a month, and I'd never used wire wrap before. (The tool and wire were the other "hidden" cost of the project--\$10 or so total.) The table below shows the keyboard as it will appear upside-down when you are wiring it. Each key is shown, along with its wiring code. Note one trick from Mr. Julin that is NEAT! The caps lock is wired in parallel with both shift keys, allowing you to set either graphics or lower case as the normal (unshifted) key mode, (you'll have to unshift to use punctuation though.)

(HM)													RPT		
DEL	ESC	/	+	-	Ø	9	8	7	6	5	4	3	2	1	(unused)
H2	G1	H4	H8	H9	G9	H3	G4	G3	H5	G6	G5	H7	G8	G7	
(CSR)													(not TAB)		
LF	BK	:	=	P	O	I	U	Y	T	R	E	W	Q	\$	B2
G2	H1	E6	H1Ø	E1	E3	D4	D3	C4	C3	B4	B3	A4	A3	B2	
													(REV)		
RET	*	"	;	L	K	J	H	G	F	D	S	A	LOCK	CTRL	
F7	H6	A2	E7	E5	D6	D5	C6	C5	B6	B5	A6	A5	A9	A1Ø	
													(STOP)		
)	(SH	?	.	,	M	N	B	V	C	X	Z	SH	BRK	
E2	E1	A9	E8	G1Ø	D8	D7	C8	C7	B8	B7	A8	A7	A9	E1Ø	



Hal Chamberlin's article in Sept 77 BYTE outlined a brief history of computer music, and offered strategies for implementing a system for the 6502 based microcomputers. Reading, and rereading the piece makes it clear that Chamberlin's advanced work is a well conceived hardware and software scheme for coding music of up to four parts, or voices.

Presently, Chamberlin, with David Cox, are proprietors of Micro Technology Unlimited (841 Galaxy Way, PO Box 4596, Manchester, NH 03108), and are offering the hardware described in Hal's article, along with a number of other relatively sophisticated products for the PET, KIM, and other 6502 machines.

Along with the software work done by Dr. Frank Covitz, Jim Butterfield, Mike Louder, and Chris Potter, NTU's DAC Music Board is an excellent investment for PET owners.

Dr. Covitz has embellished Chamberlin's original software system, and adapted it for the PET. Reportedly, it will be available through NTU at about the same time a specific PET version of the DAC board is made available (mid March).

Presently, the board available is designed for the KIM, and requires +5 and +12 volts from a power supply. This is no problem if the user would like to mount the board in a box, and power it from batteries. It is simple, and in fact, may be preferable. The PET version, although a single +5 volt version, will require a tap onto the second cassette port, a bit of trouble for anyone using a second cassette deck.

Attaching the KIM designed board is a simple matter, requiring the tying of 8 bit lines from the parallel port, ground, and battery power to one edge. The addition of a small speaker, or a cable to a stereo or hi-fi system, completes the system.

Frankly, the system sounds impressive, its tones resembling those of a throaty pipe organ. Waveshape, attack and decay, are controllable via software. Dr. Covitz's software reportedly allows each of the four voices to be of different waveshapes, and it appears that coding music from sheet transcription is a complex but understandable procedure. Using good speakers, the system is amazing, and does things that users never thought possible with their machines. The secret, according to Mike Louder, is all in the design of the on-board filter which traps out the computer's switching noise.

Adjunct to the music system, Chris Potter has demonstrated a remarkable voice synthesis program, in which the human voice (or any other sound) can be digitally "recorded" into memory, and called back under program control. The fidelity is so good (much better, for instance than Bob Bishop's "Appletalker" program) that the results are startling. Hopefully, Chris Potter's routines will be made available in the near future.

The DAC Music Board is another good sign of support for the PET, and companies like NTU who are dealing in advanced, creative products should be supported. In a way, an investment in them makes our investments in our computers that much more valuable. -Tim Onosko-

All the shift functions of the keys will work, but are not indicated. I find it easier to do graphics and number games on the original keyboard.

One last note, make your final connection by scraping off the insulation from a 1/16th. inch section of each keyboard wire and wrapping the new wire around the bare spot, forming a "T" connection. After the board tests "good", then apply a bit of solder to each connection, and wrap each in electrical tape. Have fun!

```

2 WR=2
4 REM
6 XA=1025:XB=1025:REM
8 ON WR GOTO 10,16,44:REM
10 XF(1)=94:XF(2)=255:XF(3)=91:REM
12 XT(1)=19:XT(2)=20:XT(3)=17:REM
14 GOTO 20:REM
16 XF(1)=19:XF(2)=20:XF(3)=17:REM
18 XT(1)=94:XT(2)=255:XT(3)=91:REM
20 IF PEEK(XA)=0 THEN 44:REM
22 XB=PEEK(XA)+(PEEK(XA+1)*256):REM
24 XC=XA:REM
26 IF PEEK(XC)=143 THEN 32:REM
28 XC=XC+1:IF XC<XB GOTO 26:REM
30 XA=XB:GOTO 20:REM
32 FOR XD=XC TO(XB-1):REM
34 ::FOR XE=1 TO 3:REM
36 ::IF PEEK(XD)=XF(XE)THEN POKE XD,XT(XE):GOTO 40:REM
38 :NEXT XE:REM
40 NEXT XD:REM
42 XA=XB:GOTO 20:REM
44 PRINT "ICLRJNOW LIST":STOP:REM
    
```

NO LIST DEMO

UNLIST - LIST PROTECTION
idea from Jim Butterfield
by Len Lindsay & Bill Coughlin

make sure to type an "↑" after each REM

In the BEST OF THE PET GAZETTE page 60 I told PET users an easy way to protect any line in their program from being listed. Here is a second way that you can protect your ideas. The DEMO PROGRAM demonstrates the principle. Type it in and LIST it. Run it and list it. Change line 2 by entering;

2 WR=1 [RETURN]
Now RUN it then LIST it. See how the value of WR changes your ability to list the program. So, just what is happening? While your PET is doing a LIST it still can execute some special functions if they are part of the line being LISTed and not in "quote mode". Special functions that can be executed during a LIST include HOME(19), DELETE(20), CURSOR RIGHT(29), and CURSOR DOWN(17). By POKEing the value for these functions after a REMark you can include them at the end of your line. First put something, like a "PI" or "up arrow" in your listing. Once the line is stored in memory you simply replace those values with the values of the special function you wish to be executed. Since a DELETE will erase the last character listed, 20 DELETES at the end of the line will erase the last 20 characters in the line. You can erase a whole line in this manner if you have room on your line after a REMark. You could even include a fake line after the DELETES which when listed would appear to be the correct line. By including the HOME function at the end of a line, the next line listed will start at the top of the screen. Our DEMO program shows every line LISTed at the top. There are many variations on this. Please write with your ideas and uses. Also, anyone want to submit a detailed explanation on why this works?



REVIEW - \$39.95 - STEP BY STEP
Program Design Inc
11 Idar Court - Dept 400
Greenwich, Conn 06830

This course consists of 10 lessons designed to teach the beginner in programming BASIC. There are 8 quizzes to test specific functions presented in the preceding lessons. Two tests cover the entire course. PRINT statements right up to array handling are covered. (No data files however) This course is aimed at the beginner and thus gives an excellent basis from which to start programing in BASIC. -by G von Hollen.
SPECIAL NOTE: Here is one of the few PET products that includes a professional touch. The 67 page manual comes inside a beautiful padded 3 ring binder. Inside the front cover are the three tapes. The cover appears to have a nice silk screen identification.

S SPEAKEASY SOFTWARE
Box 1220
Kemptville, Ontario, CANADA

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

SSI
4327 East Grove St
Phoenix, AZ 85040

WARREN SWAN
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Berkeley, CA 94704

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Z ZZYP DATA PROCESSING
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Bryan, TX 77801

! ALADIN AUTOMATION
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San Diego, CA 92110

BYTE SHOP
6019 W Layton Ave
Greenfield, WI 53220

KILOBAUD
Peterborough, NH 03458

MICROSETTE
777 Palomar Ave
Sunnyvale, CA 94086

MICROTRONIX
PO Box Q
Philadelphia, PA 19105

PROGRAM/PETABLE
PO Box 461
Phillipsburg, PA 16866

QUANT SYSTEMS
PO Box 628
Charleston, SC 29402

REVIEW - \$3 - CALENDAR

Warren Swan

15933 Grove Ave, Oak Forest, IL 60452

This is a fantastic calendar program which operates in two modes: Give it a date/month/year and the program gives you the day of the week. Or give it a month and year and you will see a very nice well-formatted full-size calendar for that month on the screen. It is clear and quite easy to read. Then one has the option of bumping forward or backward to adjacent months, or getting a new month from another point in time entirely.

One major caution, however. The program merrily responds to a calendar request for any month between January, 32766 B.C. and December, 32767 A.D. One must bear in mind that the Julian calendar was not adopted until the decree of Julius Caesar in 45 B.C.

Anything before that does not follow any convenient algorithm. We must further realize that in 1582, Pope Gregory XIII eliminated the 10 days between October 4th and 14th to correct errors in the Julian calendar. This was not adopted in Protestant countries at that time, and it was not until September 2, 1752, that the American colonies joined the entire British Empire in correcting the calendar.

This program takes neither correction into account. Therefore everything before 1582 must be considered inaccurate, and, for American dates, everything before 1752. Also, sometime in the next 1500 years, another adjustment will have to be made.

Aside from these shortcomings, a wary user can get a quick and accurate calendar within a reasonable range of dates. My suggestion for the next version is the addition of some validity edits and/or warning messages for dates outside the range of accuracy.
-by Steve Kortendick

MACHINE LANGUAGE GUIDE

NOW AVAILABLE in a single source from ABACUS SOFTWARE is a comprehensive guide to the inner workings of your PET Computer. This guide will show you how to access many of the operating system and BASIC routines from a machine language program.

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GRAND RAPIDS, MI. 49510

DUAL JOYSTICK CONVENTION (BEST OF GAZETTE pg 42) A REVIEW by Walt Crawford

Luckily, I had a couple of Atari joysticks laying around the house from a somewhat unused Atari set. So, after I scrounged a DB-25P connector from Mike Louder and some diodes at the local R.S. store, I was able to put it all together in a couple of hours. However, for those of you not so lucky to have this stuff laying around, Chuck Johnson's price of \$36 for the whole works (including Snake cassette) is a super bargain. So far, I have modified my Starwars Trainer and Chase programs to use Chuck's hook up and it works swell. I don't have any dual uses yet, but there will be no trouble implementing it. Here are some suggestions for the software: I changed the DATA statement for Starwars Trainer to -
DATA 99,99,99,5,5,8,99,5,5,2,99,4,6,5
This way when you press the fire button, you get a 99 no matter what joystick position. Up, down, left and right yield movement numbers (8-2-4-6). All other positions yield 5 (stop). The DATA statement for Chase was:
DATA 5,5,5,5,5,7,9,8,5,1,3,2,5,4,6,5
This way the button always yields 5 and can be your "brakes" in a panic situation. Anyway, the nice thing about Chuck's idea is that to customize an application the only change from program to program is the DATA statement. I did some experimenting and found the fastest way was to use the statements:

```
J1 = JS((G2*PEEK(G))AND G1)
```

```
J2 = JS((G3*PEEK(G))AND G1)
```

(Where G2=1, G3=.0625, G=59471 and G1=15)

This resulted in an access time of 5.73 Jiffies for J1 and 5.89 Jiffies for J2. Notice the extra parenthesis and the value G2 in J1. This is to equalize the time for the two, otherwise J1 comes out to 4.04 Jiffies and would be an unfair advantage for joystick #1. I tried to use the routine as a defined function but the time was 7.29 Jiffies. Using strings the time was 7.93 Jiffies. I think only Machine Code will beat the above time. However, 10 readings per second is not bad and is probably as fast as any human needs.

REVIEW: DR. DALEY'S PILOT

PILOT FROM DR. DALEY IS A REASONABLY COMPLETE VERSION, LACKING ONLY THE COMPUTE COMMAND. IT TAKES ADVANTAGE OF THE PET CAPABILITIES WITH PROGRAMMED CURSOR CONTROLS AND REVERSE TYPE. THE EDITING COMMANDS PERMIT A LINE TO BE INSERTED, DELETED OR CHANGED, WITH AUTOMATIC NUMBERING.

DOCUMENTATION IS FAIR-TO-GOOD. ALL NECESSARY INFORMATION IS INCLUDED, BUT ESSENTIAL EDITING COMMANDS ARE BURIED IN THE BACK PAGES. THERE ARE A FEW UNDOCUMENTED 'DON'T DOS' SUCH AS USING COMMAS IN A LINE OF PILOT—WHICH RESULTS IN AN 'EXTRA IGNORED' MESSAGE FROM BASIC, SINCE PET BASIC SEES PILOT AS A SERIES OF INPUT COMMANDS. THERE WERE OTHER MINOR PROBLEMS, BUT A NOVICE PROGRAMMER SHOULD BE UP AND RUNNING WITHIN A FEW HOURS. AND THAT'S WHAT PILOT IS ALL ABOUT.

PRICED AT A VERY REASONABLE \$12.95, DR. D'S PILOT IS CERTAINLY A WINNER. ANOTHER PLUS: IN MY EXPERIENCE THE GOOD DOCTOR SHIPS QUICKLY.

JOHN HIRSCH

DR. DALEY'S SOFTWARE FOR THE PET

DR. DALEY's software continues to expand offerings. Listed below are our most popular programs. No PET owner should be without these. Dealers, you should stock them as well.

PET TREK 3	Like STARTREK, but has several UNIQUE features. For example, the unpredictable EXPERIMENTAL RAY, who knows what it will do	\$ 7.95
BACKGAMMON	It's you vs the PET with an exciting game of BACKGAMMON	\$ 7.95
MASTER MIND	Plays two simultaneous games, one where you guess PET's secret code, and another where PET guesses yours	\$ 7.95
RENUMBER	Will renumber your BASIC programs, including all jump statements. For a 6K source code requires less than 5 seconds	\$12.95
PILOT	A BASIC coded PILOT interpreter. A second high level language for the PET. Simple to use, even a ten year old can learn to use PILOT quickly. With sample PILOT programs and documentation	\$12.95
CHECKBOOK	Will balance your checkbook and save totals in 16 categories on tape. Will produce end of month and year to date summaries. Categories can easily be changed to suit your own purposes.....	\$12.95
MAIL LIST	Keeps a mailing list and will sort the list into sub groups using up to three search parameters	\$12.95

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FLASH!	We have just acquired the rights to distribute a linking loader for BASIC programs! This will allow you to link exclusively numbered BASIC subroutines in memory. No serious programmer should be without this useful programming tool.....	\$12.95

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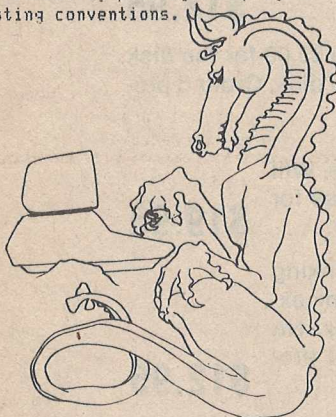
Phone (616) 471-5514 Sun. to Thurs. noon to 9 p.m. eastern time

REVIEW
 CALCULATORS/COMPUTERS
 6 issues \$10
 PO Box 310 - Dept F4
 Menlo Park, CA 94025

Calculators/Computers is an excellent magazine for the personal computer user, especially beginners, teachers, and parents. Each issue has many BASIC program listings and intriguing articles. There always is at least one article or program for the PET. To give you an idea of how easy it is to read and understand this magazine we are fortunate to have their permission to reprint a short part of a continuing series by Bob Albrecht. PET BASIC FOR PARENTS AND TEACHERS is reprinted on this page and the next.

COMING ATTRACTION
 -Review-

Next issue we will feature an interview with THE DRAGON. One of the founders of Peoples Computer Company, Bob Albrecht is respectfully known as the Dragon. He shares the Editor role for RECREATIONAL COMPUTING MAGAZINE (PO Box E, Menlo Park, CA 94025) with two other dragons. Anyone using a home computer, especially the PET should subscribe to this magazine. (\$10 per year) They lead the way with information on the PET including pushing for program listing conventions.



REVIEW Pleiades Game Co.
 TANKTICS 202 Faro Ave
 \$15.00 Davis, Ca 95616

So far there seems to be very few games which you play against the PET that are really challenging. Tanktics is one of the few. The game is formulated after board games such as Tactics II, Kriegspiel, D-Day, etc. These are great games if you can find some one to play against. TANKTICS is the same style of game but you play the PET. You get detailed instructions, a HEAVY paper game board, markers, and the program of course. The program is in 2 parts, the first part in machine language. You are given an objective and starting points. You can command up to ten tanks, but the PET has double the number you choose. You move your tanks up to a maximum amount of hexes depending upon terrain. Both you and the PET play blind of each other except for sightings when you get close enough, again depending upon terrain and also weather conditions. When you sight an enemy tank you can fire at it. Various factors determine if you destroy it. All in all it is a very enjoyable game and the PET is very tough to beat.

By BILL BENDORITIS

PET BASIC

for Parents and Teachers

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 January/February 1979

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 Bob Albrecht
 PO Box 310
 Menlo Park, CA 94025

PART 6

By BOB ALBRECHT and KARL ALBRECHT

(Karl is 10 years old and Bob is somewhat older)

MAKE IT MOVE

Last time, we described conventions for writing PET programs. This time, we will use these conventions in a simple animation program. In future issues, we will expand on the idea of animation, making images move on the screen.

Our program will (1) clear the screen, (2) draw the ground across the screen, (3) plant a tree on the ground and (4) walk a dog along the ground from the left edge of the screen over to the tree. We begin with an outline of the program, written with REMARK statements only.

```
100 REM***THIS IS A SIMPLE PROGRAM TO
110 REM***CLEAR THE SCREEN, DRAW THE
120 REM***GROUND, PLANT A TREE, AND
130 REM***WALK A DOG TO THE TREE
200 REM***CLEAR THE SCREEN
300 REM***DRAW THE GROUND
500 REM***PLANT A TREE
700 REM***WALK A DOG TO THE TREE
```



Lines 100 to 130 are complete as shown above. They simply describe what the program is to do. Now, let's start adding statements following each REM so that each block (200, 300, 500, 700) actually does what the REM says will be done. Block 200 is easy!

```
200 REM***CLEAR THE SCREEN
210 PRINT "[CLR]"
```

Remember, this means



Block 300 is a little harder. We want to put the ground about two-thirds of the way down the screen. Let's see now: $(2/3) * 25$ is about 17. So ...

```
300 REM***DRAW THE GROUND
310 PRINT "[HOME]";
320 PRINT "[17 DOWN]";
330 FOR K=0 TO 39
340 PRINT "[&]";
350 NEXT K
```

Remember, this is



OK, try the program. Your PET should clear the screen, draw the ground across the screen about 2/3 of the way down from the top, then stop. The word READY will appear and the cursor will blink, blink, blink.

The graphic symbol which we have chosen to represent the ground gives the impression of a rich, porous soil, good for flowers, trees, earthworms and other living things.

REVIEW
 BIG KEYBOARD
 \$125

Skyles Electric Works
 599 N. Mathilda Ave., Suite 26
 Sunnyvale, Ca 94086

When I bought my PET I didn't think that the little keyboard would bother me because I'm a two finger typist. But as I used the PET more and more I found myself trying to go faster and faster. Unfortunately the small keyboard makes that difficult. Writing reviews with a word processor really brought out the problem. The Skyles keyboard is really the answer. It was simple to install. You just open up the PET, disconnect the pet keyboard, plug in the full-sized keyboard, and away you go! If you still want to use the PET'S keyboard you can plug it into a connector on the big board and you can use both at the same time. (great with 2 player games) Since I'm not a real typist, I asked my wife to use it. She said it was as smooth and easy to use as an electric typewriter. All PET key functions including graphics are duplicated, but it takes awhile to find everything with the new key arrangement. The keyboard is attractive and is encased in a heavy-duty case. I really liked it.

By BILL BENDORITIS

LARGE LETTER PRINTER - \$5
 Warren Swan
 15933 S Grove Ave
 Oak Forest, IL 60452

Next, let's plant our tree. The "clubs" symbol



makes a nice tree. Let's put it on the ground about two-thirds of the way across the screen. Hmm... (2/3)*40 is about 27.

```
500 REM**PLANT A TREE
510 PRINT "[HOME, 16 DOWN, 27 RIGHT]";
520 PRINT "[X]";
```

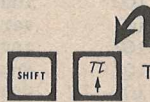
Remember, this means



Add the above statements to the program and RUN it. Oops! The READY wipes out part of the ground. Never mind — we will take care of that later. After all, we are not yet finished. Time to walk a dog over to the tree.

```
700 REM**WALK A DOG TO THE TREE
710 PRINT "[HOME, 16 DOWN]";
720 FOR K=0 TO 26
730 PRINT "[↑]";
740 NEXT K
```

Aha! Press



This is our dog!

The program is complete! Or is it? RUN the program. Oops — too many dogs! Count them. We get 27 dogs.

Alas! Our program does not work. Instead of walking *one* dog to the tree, we end up with 27 dogs on the screen. Could they be clones? Does our dog leave a copy of her/him self behind everywhere that she/he goes?

Back to the drawing board. Here is our second try.

```
700 REM**WALK A DOG TO THE TREE
710 PRINT "[HOME, 16 DOWN]";
720 FOR K=0 TO 26
730 PRINT "[↑]";
740 FOR Z=1 TO 100 : NEXT Z
750 PRINT "[LEFT,SPACE]";
760 NEXT K
```



All right. RUN this one. The dog walks (runs?) across to the tree and ... *disappears!* Where is the dog? We don't see him/her on the screen next to the tree. Could this be Gandalf's dog?


Aha! It is not a superfast, magical, disappearing dog. Instead ... (sigh) ... it is a mistake in our program. Oh well, no one is perfect.

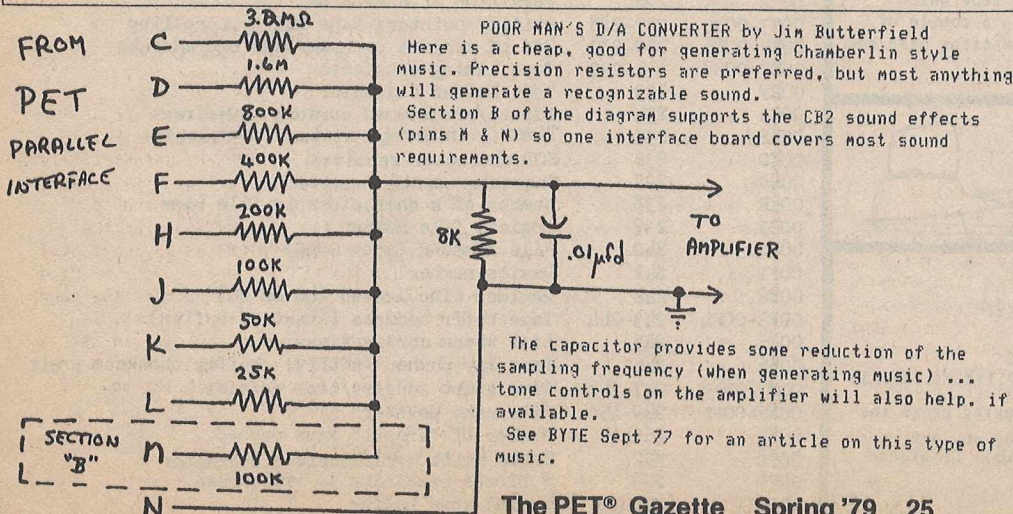
MICROCHALLENGE™ Write us a letter telling us what is wrong with our program. Why did our dog walk so quickly to the tree, then disappear?

MICROCHALLENGE™ Fix the program so that the dog walks to the tree, then stops, remaining visible.

Just one more thing. Add the following to the program.

```
900 REM**WAIT'FOREVER' SO PEOPLE CAN WATCH
910 GOTO 910
```

This will get rid of the READY that clobbers part of the ground. Press  to stop the program. Bye for now.



This program effectively translates your monitor from a 40 x 25 output display to a 9 x 5 display using very large letters. The caps, digits, and all ASCII punctuation is fully supported. It's a pleasure to tap a key and see the display fairly holler at me.

There are three modes of operation: Keyboard entry, message definition and data statement messages.

The keyboard technique is used to write a static message on the screen. Full scrolling, clear, and all cursor controls work nicely to help give your message that professional touch. Using the message definition facility, one can enter messages (up to 10) to store until they are called (using shift-W, for Write). One message can even call another message, so one can set up a repeating loop of the whole thing. Another option is to turn the screen off and on, giving a flashing effect. This also gives one a chance to set up the text "while nobody is looking," which adds a nice touch.

With data statements one can do everything mentioned above (except, because of BASIC's string handling, use quotes), including calling other messages. Additionally, one can save them with the program, so they need only be entered once.
 by Steve Kortendick

BASEBALL - \$4
 Warren Swan
 15933 S Grove Ave
 Oak Forest, IL 60452

This is a graphic version of the baseball game from Sept 77 Kilobaud. The graphics are good, showing even the bat swinging, the ball flying through the air, and the players running to the bases. Cute comments are also printed at the beginning of the game.

Unfortunately, the game itself is rather dry. The batter and the pitcher each choose a number indicating the number of bases he will take (1-4). If the numbers match, the batter hits and takes that base. If not, it's considered an out.

The first few minutes of the game are fun, watching the action on the screen. But after that, it becomes a simple matter of "pick a number between one and four," which is not my idea of an exciting game. It is a good example of effective use of PET graphics and pokes directly to the screen. And who knows, it might keep the kids happy for a little while, anyway. by Steve Kortendick

REVIEW
PET SOUND
\$19.95

CAP ELECTRONICS
1884 Shulman Ave.
San Jose, Ca 95124

This is a very nice sound system. It is a name brand AM radio which has been modified so that when the PET'S CB2 output (pins M & N) is plugged into the earphone jack the radio functions as a speaker. The radio still works as a standard radio when the earphone is not connected. The system includes all necessary parts. Included are complete instructions on how to program for sound, and a demonstration tape showing some different types of effects you can make. This speaker uses the same sound conventions as proposed by the PET GAZETTE. This speaker has very good sound and volume control.

By BILL BENDORITIS

CHECKERS - \$4.95 - CAP ELECTRONICS

This is a sound version of the game of Checkers. The sound produced follows the PET GAZETTE conventions (pins M & N). It is about the same as most the other versions we have seen. The graphics are good, it plays a reasonable game, which means it isn't too tough to beat. A tone is given as each move is made. It is a standard game of checkers at a reasonable price.

By BILL BENDORITIS

BREAKTHRU - \$4.95 - CAP ELECTRONICS

This is the game better know as breakout. It is a sound version using the PET GAZETTE conventions (pins M & N). This is a good version of the game. The object is to knock away the blocks on the top of the screen with a ball using a paddle which you move back and forth across the bottom of the screen. The program allows you to vary the difficulty of the game from very easy to very hard. One option is to allow the PET to play the game and you just watch.

By BILL BENDORITIS

BACKGAMMON - \$4.95 - CAP ELECTRONICS

This program displays a Backgammon board for you to play on. It does not play the game against you but will throw the dice and will only allow the two players to use legal moves. The display is nice and the sound (which abides by PET GAZETTE conventions, pins M & N) adds to it. But it sure would be great if someone would come up with a program in which you could play against the PET!

By BILL BENDORITIS

TARGET & STARWARS THEME - \$4.95
CAP ELECTRONICS

This is basically a kids game. The object is to shoot down various sized plans with steerable missiles. The game has nice graphics and the sound adds alot to this type of program. There is a second program on the tape which plays the star wars theme while displaying a couple of characters from the movie. The sound conventions used are the same as suggested by the GAZETTE.

By BILL BENDORITIS



```
10 REM**SOFTWARE RESET**
20 REM SYS(826) TURNS IT ON & OFF
100 FOR J=826 TO 857:READ X:POKE J,X:NEXT
110 DATA 120,173,25,2,73,200,141,25,2
120 DATA 173,26,2,73,229,141,26,2,88,96
130 DATA 173,18,232,73,249,208,3,76,139,195,76,133,230
```

If you lose your cursor while RESET is running press the two keys [and SPACE simultaneously and you may get your cursor back, program intact. Courtesy of Walt Crawford/Mike Louder/Jim Butterfield.

PET MEMORY LOCATIONS

Hex	DEC	
0000-0002	0-2	USR Jump instruction
0003	3	Current I/O Device for prompt-suppress
0005	5	Cursor position for Input & Print
0008-0009	8-9	Integer address from Basic (for SYS, GOTO, etc.)
000A-0059	10-89	Basic input buffer; # of array subscripts
005A	90	Search character (usually ':' or end-of-line)
005B	91	Scan-between-quotes flag
005C	92	Basic input buffer pointer; number of subscripts
005D	93	First-character of array-name; default DIM flag
005E	94	Type: FF=string; 00=numeric
005F	95	Type: 80=integer; 00=floating point
0060	96	'DATA' scan flag; LIST quote flag; memory flag
0061	97	Subscript flag; FNx flag
0062	98	0=input, 64=get, 152=read (flag)
0063	99	flag for trigonometric signs/comparison evaluation
0064	100	input flag (supress output if negative) flag
0065	101	variable descriptor stack pointer
0066	102	second descriptor stack pointer
0067	103	dummy value (0)
0068-0070	104-112	descriptor stack for temporary strings.
0071-0072	113-114	pointer for number transfer
0073-0074	115-116	number pointer
0075-0078	117-120	product staging area for multiplication
007A-007B	122-123	start of basic pointer
007C-007D	124-125	end of basic/start of variables pointer
007E-007F	126-127	end of variables/startof arrays
0080-0081	128-129	start of available space pointer
0082-0083	130-131	bottom of strings (moving down) pointer
0084-0085	132-133	top of strings (moving down) pointer
0086-0087	134-135	limit of Basic memory pointer
0088-0089	136-137	current program line number
008A-008B	138-139	previous line number
008C-008D	140-141	previous line address (for CONT)
008E-008F	142-143	line number of DATA line
0090-0091	144-145	memory address of DATA line
0092-0093	146-147	input vector (DATA etc.)
0094-0095	148-149	current variable name
0096-0097	150-151	current variable address
0098-0099	152-153	variable pointer for current FOR/NEXT
009A	154	Y save register; new operator save
009C	156	comparison symbol accumulator: <1 =2 >4
009D-00A1	157-161	number work area for SQR, etc.
00A2	162	yardstick (3 or 7) for string garbage collection
00A3-00A5	163-165	jump vector for functions
00A6-00AA	166-170	numeric store area
00AB-00AF	171-175	numeric store area
00B0-00B5	176-181	primary accumulator E,M,M,M,M,S
00B6	182	Taylor series constant counter
00B7	183	accumulator high-order propagation word
00B8-00BD	184-189	secondary accumulator
00BE	190	sign comparison, primary/secondary
00BF	191	low-order rounding byte for primary acc
00C0-00C1	192-193	Cassette buffer length/Taylor constant pointer
00C2-00D9	194-217	Subrtn: Get Basic Char; C9.CA=pointer
00DA-00DE	218-222	RND storage and work area
00EE-00E1	224-225	Pointer to screen cursor line
00E2	226	Position of cursor on line
00E3-00E4	227-228	Utility pointer; tape buffer,scrolling
00E5-00E6	229-230	End of current program/tape end address
00E7-00E8	231-232	Tape timing constants
00E9	233	Tape buffer character
00EA	234	Direct/programmed cursor; 00=direct
00EB	235	Timer:1 interrupt status: 0=disabled
00EC	236	EOT character received
00ED	237	Character error received
00EE	238	Number of h characters in file name
00EF	239	Logical file number
00F0	240	File command (from OPEN)
00F1	241	Device number
00F2	242	Maximum line length (40 or 80)
00F3-00F4	243-244	Tape buffr address (start of buffer)
00F5	245	Line where cursor lives
00F6	246	Last key pushed (ASCII); buffer checksum; bit
00F7-00F8	247-248	Tape start address/tape pointer
00F9-00FA	249-250	File name pointer
00FB	251	Number of "insert" keys pushed
00FC	252	Write shift word/Received character
00FD	253	# blocks remaining to write/read
00FE	254	Serial word buffer



0100-010A	256-266	Binary to ASCII conversion area
010B-01FF	267-511	Stack area
0200-0202	512-514	TI and TIB clock - jiffies
0203	515	Which key depressed: 255 = no key
0204	516	Shift key: 1 if depressed
0205-0206	517-518	Clock (unused?)
0207	519	Cassette 1 status switch
0208	520	Cassette 2 status switch
0209	521	Keypress BIA: STOP & RVS flags, etc.
020A	522	Timing constant buffer
020B	523	Load=0, Verify=1
020C	524	Status (ST)
020D	525	# characters in keyboard buffer
020E	526	Reverse flag
020F-0218	527-536	Keyboard buffer
0219-021A	537-538	Hardware interrupt vector
021B-021C	539-540	Break interrupt vector
021D	541	IEEE mode
021E	542	End-of-line-for -input pointer
0220-0221	544-545	Cursor log (row, column)
0222	546	PBD image for tape I/O
0223	547	Key image
0224	548	O=flashing cursor; else no cursor shows
0225	549	Cursor timing countdown
0226	550	Character under cursor
0227	551	Cursor blink flag
0228	552	EOT bit received
0229-0241	553-577	Line address high & screen line wrap table
0242-024B	578-587	Logical numbers of open files
024C-0255	588-597	Device numbers of open files
0256-025F	598-607	Command/Secondary address of open files
0260	608	Inout from screen/inout from keyboard
0261	609	X-save flag
0262	610	How many open files
0263	611	Inout device, normally 0
0264	612	Output CMD device, normally 3
0265	613	Tape character parity
0266	614	Byte received flag
0268	616	Pointer in filename transfer
026A	618	unused
026C	620	Serial bit count
026F	623	Cycle counter
0270	624	Tape write countdown
0271	625	Tape buffer #1 count
0272	626	Tape buffer #2 count
0273	627	Leader counter / Pass 1:Pass 2 read
0274	628	Flag for tape error / write new byte
0275	629	Write start bit/Read bit sequence error
0276	630	Pass 1 error log pointer
0277	631	Pass 2 error log pointer
0278	632	Read mode: 0=Scan; 1-15=Countdown; \$40=Load; \$80=END
0279	633	Checksum
027A-0339	634-825	Tape #1 buffer
033A-03F9	826-1017	Tape #2 buffer
0400-7FFF	1024-32767	Available RAM including expansion
8000-8FFF	32768-36863	Video RAM
9000-BFFF	36864-49151	Available ROM expansion area
C000-E077	49152-57163	Microsoft Basic
E078-E7F8	57164-59384	Keyboard/Screen/Interrupt monitor
E810	59408	PIA1 - Keyboard A register; (Direction with CRA2=1)
E811	59409	PIA1 - Keyboard A control
E812	59410	PIA1 - Keyboard B register; (Direction with CRB2=1)
E813	59411	PIA1 - Keyboard B control
E820	59424	PIA2 - IEEE A register; (Direction with CRA2=1)
E821	59425	PIA2 - IEEE A control
E822	59426	PIA2 - IEEE B register; (Direction with CRB2=1)
E823	59427	PIA2 - IEEE B control
E840	59456	VIA I/O register B
E841	59457	VIA I/O register A with handshake
E842-E843	59458-59459	VIA Data Direction regs, A and B
E844-E845	59460-59461	VIA Timer 1
E846-E847	59462-59463	VIA Timer 1 latch
E848-E849	59464-59465	VIA Timer 2
E84A	59466	VIA shift register
E84B	59467	ACS: T1.T2.SR.SR.SR.PB.PA
E84C	59468	PCR: B2.B2.B2.B1.A2.A2.A2.A1
E84D-E84E	59469-59470	IFR, IER: T1.T2.CB1.BC2.SR.CA1.CA2
E84F	59471	I/O Register A without handshake
F000-FFFF	61440-65535	Reset/tape/diagnostic monitor



REVIEW - OHELLO - CMS SOFTWARE
5115 Menefee Dr \$7.95
Dallas, TX 75227

It's you vs the PET or another player in this board game of reversing moves. A reversing move must be placed so that it 'captures' one or more of the opponent's men between it and another of your men. When the entire board is filled, the player with the most pieces wins the game.

CMS SOFTWARE has done an excellent job on this program. The instructions are good-even a novice could play. You can choose to play the PET or another player - It does play a fairly good game! The checkerboard graphics are good, and the program displays a running scoreboard and whose turn it is to move. A nice feature is that you don't have to hit RETURN after your move. You enter ROW number then COLUMN number. Be careful with the small keys on the PET's keyboard.

I was impressed at the speed at which this program analyzes the board and determines it's move (especially since it is written in BASIC). A quick look at the code indicates that CMS sure knows the internal workings of the PET. A nice feature of this OHELLO program is that you have your choice of playing the PET or another player - After the PET clobbers you, perhaps you could take on your grandmother.

This program was a pleasure to review-it was written and presented in a professional manner.

Review by Bill Coughlin

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

Casino Blackjack is a good example of a well-written program. It allows for up to five participants to play against the house, insurance bets to be placed, pairs to be split, and hands to be doubled down. These are the rules of standard Las Vega, Nevada play. In addition, each player may reset the amount in his "bank" to zero, ask that the "boot" (from which the cards are dealt) be changed and reshuffled, or obtain a detailed progress report on the day's play.

The playing card graphics are very nice. Nothing elaborate, but good from the standpoint that the hands are "stacked" to be compact yet still readable. - Tim Onosko

REVIEW - \$12.95 - LINK - DR DALEY
425 Grove Ave

Berrien Springs, MI 49103

Here's a handy utility program that actually works! If you're tired of re-keying common (standard) routines into your BASIC programs then this program is a must for you!

LINK is a program that combines two or more BASIC programs (Modules, subroutines, etc). The restrictions are: each module have a different range of line numbers than the others being LINKed; each module must be linked in DESCENDING order. The first program has a higher set of line numbers than the 2nd one (The highest line number of the 2nd program is less than the lowest line number of the 1st program)

You can guarantee that all of your common routines have a unique range of line numbers by using one of the many RESEQUENCE programs available (make sure you get one that allows you to enter the beginning line number) By using this LINK program you can then "throw together" your programs in a hurry! You could also work on different sections of one program individually and then LINK them together to test the entire program.

This program comes with detailed instructions - FOLLOW IT EXACTLY - If you don't your PET will CRASH!! The instructions say that you can combine more than 2 programs in one pass - however, I recommend LINKING 2 programs, SAVE it, then run the LINK process again until you've merged all the modules you need. Recommended - Bill Coughlin

If you have Connecticut Microcomputer's Word Processor Program change the following lines as listed and you will hear a little beep every time you hit a key. (using pins M & N for sound output)
6043 GET#5,C#:IFC#=""GOTO6043
6044 POKE59467,16:POKE59466,9:POKE59464,222:FORQK=1TO15:NEXTQK
6045 POKE59467,0:POKE59466,0:POKE59464,0
6046 IFST1AND64THENRETURN

E810	DIAGNOS. SENSE	IEEE EOT in	CASSETTE SENSE #2	KEYBOARD ROW SELECT #1	PA	59408				
E811	TAPE#1 INPUT FLAG	...	SCREEN BLANK OUTPUT CA2	DDR A ACCESS	CASSETTE #1 READ CONTROL CA3	59409				
E812	KEYBOARD ROW INPUT					59410				
E813	RETRACE I FLAG	...	CASSETTE #1 MOTOR OUTPUT CB2	DDR B ACCESS	RETRACE INTERR. CONTROL CB1	59411				
E820	IEEE-INPUT					59424				
E821	ATN I FLAG	...	IEEE NDAC out CA2	DDR A ACCESS	IEEE ATN in CA1	59425				
E822	IEEE-OUTPUT					59426				
E823	SRQ I FLAG	...	IEEE DAV out CB2	DDR B ACCESS	IEEE SRQ in CONTROL CB1	59427				
E840	DAV in	NFRD in	RETRACE IN	CASS #2 MOTOR	CASSETTE OUTPUT	ATN out	NFRD out	NDAC in	PB	59456
E841	DIRECTION REGISTER B (FOR E84D)									59457
E842	DIRECTION REGISTER A (FOR E84F) (P.U.P.)									59458
E843	TIMER 1									L 59460
E844	TIMER 1 LATCH									H 59461
E845	TIMER 2									L 59462
E846	TIMER 2 LATCH									H 59463
E847	TIMER 1									L 59464
E848	TIMER 2									H 59465
E849	SHIFT REGISTER									59466
E84A	T1 CONTROL		T2 CONTR.		SHIFT REG. CONTROL			PB, PA LATCH CONTROL		59467
E84B	PBT out		ONE-SHOT FREE-RUN		PDB SENSE					
E84C	CB2 (P.U.P. PIN) CONTROL			CB1 in CASSETTE#2 POLARITY		CA2 (Graphics, Lower Case) Control		CA1 in POLARITY		59468
E84D	IRQ STATUS	T1 INT	T2 INT	CB1 INT	CB2 INT	SR INT	CA1 (P.U.P.) INT	CA2 INT		59469
E84E	ENABLE CLEAR/SET	T1 INT ENAB	T2 INT ENAB	CB1 INT ENAB	CB2 INT ENAB	SR INT ENAB	CA1 INT ENAB	CA2 INT ENAB		59470
E84F	PARALLEL USER PORT I/O (PA)									PA 59471

Review-TNW 488/232 Serial Interface Module

I have only good things to say about The Networks, its people, and its product. Within two weeks of ordering, I received my RS232 interface module. A superb manual comes with it. Whether you are a computer novice, or an EE in digital electronics, this manual can actually be read and used easily! Precise installations with common examples (printer, modem) are provided. Software examples using PET BASIC are complete and well written. Even the theory of serial transmission and how it differs from parallel is discussed.

I was able to get the module to operate to a serial printer through BASIC with no problems. However, the main purpose for purchasing the module was to use the PET as a terminal into a local timesharing computer. I discovered that BASIC was not able to keep up at 300 baud. About 10% of the characters coming from the timesharing computer were lost. This was certainly unacceptable. The alternative was to write a program in 6502 machine language to accomplish this purpose. At this point Doug Gage of The Networks proved to be very helpful. He discovered PET sub-routines that sent and received characters. He even wrote a sample program demonstrating these routines.

Ken Cox
322 Joanne St
Cedar Falls, Iowa

REAL TIME STARTREK by Warren D. Swan

With all the versions of a good old Star Trek game abounding, one is hard-pressed to find one that is ahead of the rest. This, however, may be just that version. The breakthrough is that it is played in real time: there is not a lot of time to ponder galaxy-shaking decisions.

Nine levels of difficulty are provided, each with a different number of real-time seconds equivalent to one star-year. Beginning at level one (OK, so I'm a space chicken), I had a most enjoyable time of unsuccessfully attempting to save the Federation. As I paused for calculations, my galactic records would go out, shield energy controls malfunction, warp engines weaken, etc. The maladies with which I was afflicted were a perfect balance; I found myself tense, but not frustrated.

The options are conveniently entered via mnemonic, rather than numeric code (e.g. L=Long range scan, C=computer report). Another clever feature is the possibility of entering warp factors within one sector as inter-sector distances followed by an S, rather than as one-eighth those distances. A move of one unit, then is either 1S, or, as with more simple versions, .125. There is also good protection from leaving the program by inadvertently hitting the enter key without data.

Full documentation is included. This contains even the variable names and subroutine numbers to make modification (in the remaining 24 free bytes) very easy.

As the addictive series of games continues, one finds some very tense, taxing games with several Klingons interspersed with an occasional quick game in which as few as three Klingons in Federation territory. The blend is delightful.

My only regret is that a graphics feature was not incorporated into this version. It gives me great personal delight to actually SEE my photon torpedoes winging through space, 'till their collision with an ill-fated Klingon warship. This feature would also make re-calculation of trajectory far simpler than the teletype-oriented TORPEDO COURSE 3-3, 2-2, 1-1, MISSED

The difference between versions 3.1 and 4.0 is that the second adds the problem that a starbase may be only a space station at which the Enterprise may refuel and rejuvenate, but which will destruct upon the starship's departure. It makes advance planning quite crucial--quick stops at starbase while "in the neighborhood" are suddenly serious decisions.

So what more can one say about a well-written, thoroughly-documented, fast-moving version of the most popular game ever written in BASIC? You'll find it delightful. by Steve Kortendick

REVIEW - STARTREK - \$12.95

Dad's Reliable Software, 1614 Norman Way, Madison, WI 53705

There are many versions of STAR-TREK on the market but this one deserves to be reviewed again. It is more complex and much tougher to beat than most. What really makes it enjoyable is rather than moving from one quadrant to the next, sitting still until you wipe out the Klingons, you move through the universe at a speed you determine. You have thrusters which allow you to control your velocity in the X and Y directions. The faster you move the quicker you have to be as you move from quadrant to quadrant. When you enter a quadrant containing Klingons they start shooting and keep firing until either you finish them off or leave the quadrant. For fire power you have both forward and rear phasers as well as torpedos. But, your torps aren't as easy to use as most. When you plot their course you have to take into account the velocity of your ship. (Like shooting out of a moving car.) The game isn't too tough if you move at a snails pace, but then it takes for ever. The trick is to move through the universe at a speed which won't make the game last forever but still allow you to react to each situation. All in all a super game.

By BILL BENDORITIS

SCREEN DUMP

THIS PROGRAM PRINTS THE SCREEN DATA ON THE PRINTER.

```

100 OPEN 5,3: REM UNLESS ALREADY OPEN
50000 FOR NY=0 TO 24
50010 FOR NX=0 TO 39
50020 NS=PEEK(32768+NY*40+NX)
50030 NS%=CHR$(NS)
50040 IF NS>=0 AND NS<32 THEN NS%=CHR$(NS+64)
50050 IF NS>63 AND NS<96 THEN NS%=CHR$(NS+32)
50060 PRINT#5, NS%;
50070 NEXT NX
50080 PRINT#5:FOR NV=0 TO 5:PRINT#5,CHR$(0);:NEXT NV:NEXT NY

```

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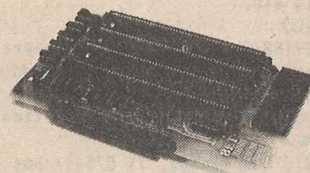
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PAPERWARE

REVIEW

The Microcomputer Resource Center (1929 Northport Dr, Room 6, Madison, WI 53704) has published THE BEST OF THE PET GAZETTE. This 100 page publication includes over 100 reviews of PET products, 20 program listings, and addresses to virtually every company marketing PET products as well as informative articles and coments. It retails for \$10 and is available from your PET dealer or directly from the Microcomputer Resource Center. Regular issues of the PET GAZETTE magazine are FREE. Send a LARGE (9 x 12) envelope, self addressed with \$.41 postage for a copy of the next issue.

REVIEW

MICRO (PO Box 3, Chelmsford, MA 01824) is a bimonthly magazine for 6502 systems (including the PET, KIM, and APPLE). A subscription is \$6 per year. Every issue contains several articles useful to PET Users.

REVIEW

CALCULATORS/COMPUTERS (PO Box 310, Dept P, Menlo Park, CA 94025) is a bimonthly magazine emphasizing educational uses of computers and calculators. Each issue has articles of interest to PET Users. 1 year subscription is \$10.

REVIEW

COMPUTER CASSETTES Reference List by Robert Purser (PO Box 466, El Dorado, CA 95623) is published quarterly and lists virtually all available software for the PET, APPLE, and TRS-80. 1 year subscription is \$12.

REVIEW

TIS (PO Box 921, Los Alamos, TX 87544) has just published their PET WORKBOOK #6, PET Control and Logic Statements. It explains logical and relational operations, character codes, number systems, symbols, and branching techniques. Price is \$3.95.

There are four other books you should be aware of. SYBEX (2020 Milvia St, Berkeley, CA 94704) announced two new books. Microcomputer Programming:6502 by R Zaks for \$9.95 and the 6502 Applications Book for \$12.95. DILITHIUM PRESS has 32 BASIC Programs for the Commodore PET Computer by T Rugg and P Feldman for \$15.95. These programs are also available on 5 tapes at \$9.95 per tape. ADDISON-WESLEY PUBLISHING just announced Programming a Microcomputer 6502 by Foster for \$9.95.

Unbelievable as it may seem, Osborne & Associates (630 Bancroft Way, Berkley, CA 94710) are selling 74 programs on tape ready to LOAD and RUN in your PET for \$10. These are programs adapted from their book Some Common BASIC Programs (\$8.50). I have a copy of the tape and it loaded just fine.

A large, over 130 page PET USER MANUAL is now available directly from Commodore (901 California Ave, Palo Alto, CA 94304) for \$3.50 if you include a copy of your receipt or proof of purchase and your PET serial number. Surprisingly it appears that delivery takes less than 2 weeks. Information from all previous tiny manuals is included in this larger manual - plus some new information. Here are a couple examples of new information included:

- Page 31, "FRE forces a BASIC action called garbage collection. This consolidates all unused bytes into one large block so that they can be efficiently allocated."
- Page 30, "...use the RND(-TI) to seed a number sequence, and use RND(+I) for the numbers in the sequence."
- PAGE 29, "SGN...returns a 1 if the sign of the number is greater than zero, a zero if the value is zero, and a -1 if the sign is negative."
- Page 25, "The only characters that are allowed to appear in reverse field between quotes are those which are interpreted as control chatacters."

REVIEW

Looking for a good book on BASIC? BASIC FOR HOME COMPUTERS, A SELF TEACHING GUIDE has just been released by Wiley & Sons (605 Third Ave, New York, NY 10016). Bob Albrecht is one of the authors, so you know it must be good. I have a copy, and it IS good. Microsoft BASIC is used throughout. PET BASIC is a special version of Microsoft BASIC. There are plenty of examples and sample program listings. Price is only \$5.95.



REVIEW

I just received the copy of THE STRAWBERRY IMPERATIVE that I ordered from Innovision (PO Box 1317, Los Altos, CA 94022). The price is \$3.95. This 20 page typeset report comes with a bright red plastic cover. It includes some very good information and charts. For example it explains how to use several PEEKs to find the exact location of the cursor. Many PEEK/POKE locations are not discussed and a detailed memory map to PET locations is not included. But this report does help to give someone new to programing some good insights and examples of how to include PEEKs and POKEs in programs.

REVIEW

Comodore in California has finally published the first issue of their newsletter. Both Comodore in England and Canada have had PET Newsletters for quite some time - and the U.S. Newsletter was definetely not earth shattering. It of course includes lists of all annouced Comodore products and software for the PET. (announced does NOT mean that they exist) It also includes many reprints from the English Newsletter. The print on most of the program listings is so light and broken that it is virtually illegible. A 6 page list of PET dealers is also included. The price is \$15 per year. Their accompanying letter states, "This cost will soon be repaid by the time-saving and cost effective information given."

REVIEW

The Vancouver PET User's Group (PO Box 35353, Stn "E", Vancouver, B.C., Canada V6M 4G5) is now publishing Vancouver PET News. Price is \$1 per copy. Their first issue is 15 pages and contains program listings, tips, and even cartoons.

REVIEW

It appears that the PET is Englands #1 personal computer so it's no surprise that each issue of Practical Computing (2 Duncan Terrace, London N1, England) has several articles aimed at PET users. This English magazine is well done. It is great to read the ads for PET products and software available in England. Overseas subscription is 12 pounds per year (12 issues).

Also in England is the Independent PET User Group (9 Littleover Lane, Derby, England) who is publishing a newsletter. Further information hopefully will be available next month.

SOFTWARE WORTH MENTIONING

REVIEW

I was fortunate to receive a review copy of TANKTICS by Pleiades Game Co (202 Faro Ave, Davis, CA 95616). I am impressed by their battle simulation game. Since it is unrealistic to graphically represent a 24 x 32 HEXAGONAL gameboard on the PET screen they have a PET game package for \$15. This includes a 17 x 22 inch map, players manual, 31 playing counters, and 2 segment TANKTICS program on tape (first segment is in machine language). In this simulation it's you against the PET. The PET keeps track of all the peices, decides the outcome of battles, and has its own strategy of play. Being realistic, you never know where the PET has its TANKS until one of your TANKS sights one. The PET gives you a list of your sightings at the beginning of each turn. As you move your pieces on the board you type in your moves to keep the PET up to date on your locations.

This game is a MUST for anyone who likes War Games as sold by Avalon Hill and others but often can't find someone to challenge. I hope more games of this type become available soon. How about someone writing a program for the game RISK!!

Keep your eye on PROGRAMMA CONSULTANTS (3400 Wilshire Blvd, Los Angeles, CA 90010). This company is growing rapidly and already includes some of the BEST professional PET programmers. Their programs will all be FULLY supported including corrections if needed. The PET GAZETTE has arrangements to PREVIEW their new programs as they are announced. There are exciting things brewing!!

REVIEW

Tycom (68 Velna Ave, Pittsfield, MA 01201) has just released several good PET programs. My favorite is MAX, a fun dice game, with good graphics. Players alternate shaking the two dice. Each possible roll has its rank, - a 21 (a 2 and a 1) is the highest - called MAX. 66 is the next highest, followed by the other pairs 55, 44, 33, 22, 11. The remaining rolls are arranged in descending order (65, 64, 63, ..., 32, 31). On your turn you shake the dice inside a cup. No one sees the roll except you. You then claim a score. If your opponent believes you, he simply shakes the dice without looking at your shake. Or he may doubt you and look. If you were lying, you get a point. But if he looks and you have what you claimed -- he gets the point. The first person to get 10 points loses. Tycom has taken advantage of several little known characteristics of the PET.

REVIEW

STARFLEET ORION by Automated Simulations took me by surprise. I received a review copy within days of my request. I was shocked that it came documented, not with one manual, but with 2 - a 32 page Battle Manual and a 16 page Rule Book. The game comes as two programs, Orion and Builder. The main program, Orion, relies on input from Builder. Builder allows you to create your own versions of the game, just like Mike Richter's Huntwriter allows different versions of his Hunt game to be created. (See PET POURRI March 79). Orion is a space battle game for two or more players. (No it is NOT another Startrek) Each player commands a fleet of starships. Each ship may have different specifications. You may control movement, torpedos, missiles, shields, and even tractor beams. I have played it and must warn you, this is a thinking strategy game. Be prepared to thoughtfully read the manuals.

REVIEW

The PAK series by the PET GAZETTE (1929 Northport Dr, Room 6, Madison, WI 53704) is an excellent buy with 6 good programs for only \$10. PAK 1 series includes 7 sets of 6 programs grouped by topic.

Educational PAK 1 includes a MORSE CODE TUTOR and MATH STORY PROBLEMS. Games PAK 1 includes a fantastic version of MASTERMIND. Music PAK 1 is compatible with the PET GAZETTE conventions using user port pins M & N. Useful PAK 1 has a complete WORD PROCESSOR program included. Utilities PAK 1 includes a versatile renumbering program in machine language. It renumbers all GOTOs, GOSUBs, ON GOTOs, ON GOSUBs, IF THENs, and RUNx's. Demo PAK 1 includes a complete 3 part DATA ENTRY DEMONSTRATION. BEST of PAK 1 includes the best program from each category.

All tapes are highest quality AGFA from Germany and are guaranteed to LOAD and RUN or replaced free.

TIPS

It seems that the LOST CURSOR SYNDROME is a major problem with PETs. Several things can be done about this. You could cut a hole in the back of your PET. Then whenever you lose the cursor you could just reach in from behind, grab it and put it back on the screen. Seriously though you can get a new ROM from Commodore (called 019 ROM) for \$15. This will correct the problem. Or just avoid editing any lines near the bottom of your screen as this is a major cause of the lost cursor. Or for fun, the PET GAZETTE has a program which gives you TWO cursors at once (an ounce of prevention?).

REVIEW - \$13 - CLASS AVERAGE

Kobetek Systems Ltd - RR 1

Wolfville, Nova Scotia, CANADA BOP 1X0

This program allows teachers to input student scores for each class either as DATA statements or via the keyboard. No provision to save entries on tape if you use the keyboard method. Each students scores are averaged with results given as a percent. Names are alphabetized and listed either on your screen or your printer. (The printout is not in neat columns however) A bar graph may be drawn on the screen showing class distribution. Nothing fancy, but it seems to get the job done. If you use DATA lines your scores can be saved with the program.

STOP KEY DISABLE by JIM BUTTERFIELD

Enter the following lines into your program. Now with your stop key disabled, if you do not have input statements to escape from, your program can't be stopped. GREAT to add to a MATH DRILL program. Your kids can't slip in GAME!!

```
2 R$="78:956=1902:9038=1:025860:900484848484<85>6204<03>::9?78=09024<7>>6"
3 FORI=1TOLEN(R$)/2
4 POKEI+831,(ASC(MID$(R$,I*2-1,1))-48)*16+ASC(MID$(R$,I*2,1))-48:NEXTI
5 P1=0:SYS832
```

REVIEW - \$12 - HOUSEHOLD UTILITIES #2

Creative Software

P.O. Box 4030

Mountain View, Ca 94040

This package contains three programs: 1.)COMPOUND INTEREST- This program will calculate three things; A)Given the present value of your savings account it will calculate it's value at a future date. B)How much you must start with to have a specific amount at a future date. C)How long it will take to get to a certain amount given how much you have in the account. All require your interest rate. It makes these calculations based on daily compounding. 2.)AMORTIZATION- This program will print out a standard amortization table containing, current interest paid, payment to principle, total amount paid in interest, and the remaining balance. It will do this for any period during the loan. Obviously you have to give your payment, interest rate, and term of loan. 3.)CAR COSTS- This program is designed to calculate your cost per mile of driving you car. You must supply seven things, the program will help you calculate or estimate them if needed. They are A)cost of car, B)licensing fees, C)maintenance and repair costs, D)insurance, E)miles driven since purchased, F)amount spent on gas, G)resale value.

All these programs ran well and did what they were intended to do. I used the Amortization program to figure out how much I paid in interest on my mortgage last year so I could send in my taxes before the bank got around to sending in the information. -By Bill Bendoritis

REVIEW - \$12 - HOUSEHOLD UTILITY #1

Creative Software

P.O. Box 4030

Mountain View, Ca 94040

Household Utility #1 contains three programs 1) BUY or RENT: This program is designed to help you analyze the financial advantages or disadvantages of buying a house. Factors used in the analysis are price of the house, downpayment, length of mortgage, assumed property taxes, your income tax bracket, and an assumed inflation rate. It analyzes what the house will actually cost per month and the amount of interest your downpayment would have made in a savings account. 2)LOANS: This program will calculate one of three things, given the other two. You can calculate the amount you can borrow, how much your payments will be, or how long it will take to pay off the loan. The only additional information you must supply is the percentage rate of the loan. 3)CALENDAR: This program will calculate four things: A)The day of the week of any given date. B)The future date, given any previous date and the number of days to the future date. C)The previous date, given any future date and the number of days to the previous date. D) The number of days between any two dates. This will work for dates between March 1, 1900 & March 1, 2100. All these programs did what they were intended with the exception of the Calendar program; the number of days between two dates. This made some very odd errors. -By Bill Bendoritis

Editors note: Calendar said that there were 723,043 days from Jan 1, 1979 to July 1, 1979. It also said that 365 days after Jan 1, 1979 would be Nov 29, 0. Loans gave an illegal quantity error in 435 for a \$30,000 loan paid \$250 per month while calculating the length of the loan.

REVIEW - \$35 - DUAL JOYSTICKS

Creative Software

P.O.Box 4030

Mountain View, Ca 94040

This is another example of a company who is looking to put out quality products for the PET. This joystick connector is well engineered. It is totally enclosed in a small, compact package. The interface is made to be used with Atari joysticks (available for \$12.50 each from Creative Software). to be the most popular. The directions on how to program the joysticks are well written and show how easily they can be programmed. If you're looking for joysticks these would be a good bet. By Bill Bendoritis

REVIEW - \$10 - HURKLE & ONE-QUEEN

Creative Software

P.O.Box 4030

Mountain View, Ca 94040

These two programs are offered together. One-Queen is played on a grid like a chess board. You start out on the upper right-hand corner. The object is to get to the lower left-hand corner. Your first move is either horizontally left or down. After that the PET and you move alternately. You're allowed the above moves plus diagonally down-left. The game is tough at first but once you win the challenge is gone. Then the enjoyment comes from seeing how long it takes others to figure it out. HURKLE is a kids game. The Hurkle hides on a 10X10 grid. The object is to find it in the amount of guesses you say you will. As you make each move you are told which direction the Hurkle lies from where you are and shown graphically. Both these programs allow you to use either the keyboard or Creative's joysticks.



Fantasy Games Software

P.O. Box 1683
Madison, Wisconsin 53701



NEW for the PET 8K

Full scale role-playing adventure
games for the PET!
Action games with vivid graphics!

SWORDQUEST *The dim torchlight casts grotesque shadows as you move stealthily through the stone corridors. Suddenly, out of the darkness hurtles a nightmarish form. Red eyes gleam and fangs seek your throat as you put all your strength behind the downward stroke of your mighty two-handed broadsword . . .*

You seek the jewels and holy sword in the demon-haunted tomb of a long-dead wizard—can you survive? A unique application of the PET graphics.

Cassette and instruction booklet \$12.95

ESCAPE FROM THE DEATH PLANET *The air crackles with laser beams as you burn down another armored stormtrooper and dodge into a side passage a split second ahead of the energy bolts slamming into the bulkhead behind you . . .*

Can you escape the Imperial Stormtroopers and the Killer Robots with turret-mounted laser cannon? VIVID GRAPHICS! Laser beams, explosions, etc.

Cassette and instruction booklet \$12.95

Programs double-recorded on high quality cassettes. Instructions are included in separate booklets so that the full 8K memory might be utilized for the games.

Both cassettes for \$21.95

```
10 GOTD900
100 PRINT"TAPE TEST
110 POKE59468,12
120 PRINT:X$="LEADER":GOSUB500
130 X$="DATA":GOSUB500
140 X$="ERROR":GOSUB500
150 INPUT"TAPE UNIT":T
160 IFT>20RT<1GOTD150
170 POKE241,T
180 SYS(1280):END
500 PRINT"  "
510 PRINT"  |<^":X$
520 PRINT"  |  "
530 RETURN
900 Z=1280
910 READX:IFX=999THENGOTD100
920 POKEZ,X:Z=Z+1
930 GOTD910
1000 DATA 32, 59, 248, 120, 166, 241, 202, 240, 21, 206
1001 DATA 19, 232, 169, 144, 141, 78, 232, 173, 64, 232
1002 DATA 142, 8, 2, 41, 239, 141, 64, 232, 16, 11
1003 DATA 238, 17, 232, 169, 52, 141, 19, 232, 141, 7
1004 DATA 2, 169, 104, 141, 25, 2, 169, 5, 141, 26
1005 DATA 2, 88, 32, 30, 249, 44, 19, 232, 16, 248
1006 DATA 162, 2, 160, 0, 169, 32, 149, 56, 181, 48
1007 DATA 240, 6, 148, 48, 169, 160, 149, 56, 202, 16
1008 DATA 239, 165, 56, 141, 122, 128, 165, 57, 141, 242
1009 DATA 128, 165, 58, 141, 106, 129, 32, 54, 247, 16
1010 DATA 206, 48, 204, 0, 32, 116, 5, 44, 64, 232
1011 DATA 44, 16, 232, 76, 126, 230, 174, 73, 232, 173
1012 DATA 72, 232, 236, 73, 232, 208, 245, 160, 255, 140
1013 DATA 72, 232, 140, 73, 232, 224, 252, 144, 8, 224
1014 DATA 255, 208, 7, 201, 80, 144, 11, 230, 50, 96
1015 DATA 224, 254, 208, 16, 201, 96, 144, 12, 165, 232
1016 DATA 41, 252, 240, 3, 230, 48, 96, 230, 232, 96
1017 DATA 169, 0, 133, 232, 230, 49, 96, 999
```

TAPE TEST program above by Jim Butterfield

TAPE HEAD ALIGNMENT

Poor tape head alignment seems to be a major problem afflicting most PET users. Tape heads may be aligned slightly high or slightly low. If your PET's heads are slightly high you will have a difficult time reading tapes made on a PET with heads that are slightly low. You can align your heads yourself, but it is tricky business. Jim Butterfield to the rescue. Jim has come up with a beautiful little program that will test a tape as your PET is reading it. This program constantly tells you what your PET thinks it is reading, either LEADER or DATA, or if it finds an error. If your PET thinks it is reading DATA when your tape is LEADER you have a problem. You can use this program to align your heads perfectly if you use a tape that is all leader (2800 cps signal written on professional equipment). Or if you receive a tape from someone else that your PET won't read you can align your tape heads with that tape. You need a tiny screw driver and patience to adjust your head alignment. VI #6 of PET User Notes explains tape head alignment on page 2. Open the lid of your tape unit. There should be a small hole about an inch above the FFWD label. It is covered up when the lid is down. Depending on what type of tape unit came with your PET, the alignment screw should be directly under this hole when your play button is depressed. If you pry off the silver Commodore name plate on the lid you will find a hole in the lid that lines up with the other hole you found. You should be able to turn the alignment screw now while your PET is reading a tape. Now it is just a matter of moving your tape head slightly up and down until the TAPE TEST shows LEADER first then DATA (header) then a brief LEADER followed by DATA (program). Jim Butterfield said that our disassembly of the Machine Language (on the right) beginning at 1280 looks OK but was not sure about the conversion into DATA lines (on the left). We PEEKed at all the locations and verified the values. After checking this the program ran well. Please send us notes and hints on head alignment for our next issue.

0500:	20 3B FB	JSR	#F83B	055B:	A5 3A	LDA	#3A
0503:	78	SEI	055D:	8D 6A 91	STA	#813A	
0504:	A6 F1	LDX	#F1	0560:	20 36 F7	JSR	#F736
0506:	CA	DEX	0563:	10 CE	BPL	#0533	
0507:	F0 15	BEQ	#051E	0565:	30 CC	BMI	#0533
0509:	CE 13 EB	DEC	#E813	0567:	00	BRK	
050C:	A9 90	LDA	#90	0568:	20 74 05	JSR	#0574
050E:	8D 4E E8	STA	#E84E	0568:	2C 40 E8	BIT	#E840
0511:	AD 40 E8	LDA	#E840	056E:	2C 10 E8	BIT	#E810
0514:	8E 08 02	STX	#0208	0571:	4C 7E E6	JMP	#E67E
0517:	29 EF	AND	#EF	0574:	AE 49 E8	LDX	#E849
0519:	8D 40 E8	STA	#E840	0577:	AD 48 E8	LDA	#E848
051C:	10 0B	BPL	#0529	057A:	EC 49 E8	CPX	#E849
051E:	EE 11 E8	INC	#E811	057D:	D0 F5	BNE	#0574
0521:	A9 34	LDA	#34	057F:	A0 FF	LDY	#FF
0523:	8D 13 E8	STA	#E813	0581:	8C 48 E8	STY	#E848
0526:	8D 07 02	STA	#0207	0584:	8C 49 E8	STY	#E849
0529:	A9 68	LDA	#68	0587:	E0 FC	CPX	#FC
052B:	8D 19 02	STA	#0219	0589:	90 08	BCC	#0593
052E:	A9 05	LDA	#05	058B:	E0 FF	CPX	#FF
0530:	8D 1A 02	STA	#021A	058D:	D0 07	BNE	#0596
0533:	58	CLI	058F:	C9 50	CMP	#50	
0534:	20 1E F9	JSR	#F91E	0591:	90 08	BCC	#059E
0537:	2C 13 E8	BIT	#E813	0593:	E6 32	INC	#32
053A:	10 F8	BPL	#053A	0595:	60	RTS	
053C:	A2 02	LDX	#02	0596:	E0 FE	CPX	#FE
053E:	A0 00	LDY	#00	0598:	D0 10	BNE	#05A4
0540:	A9 20	LDA	#20	059A:	C9 60	CMP	#60
0542:	95 38	STA	#38.X	059C:	90 0C	BCC	#05A8
0544:	85 30	LDA	#30.X	059E:	A5 E8	LDA	#E8
0546:	F0 06	BEQ	#054E	05A1:	29 FC	AND	#FC
0548:	94 30	STY	#30.X	05A2:	F0 03	BEQ	#05A7
054A:	A9 A0	LDA	#A0	05A4:	E6 30	INC	#30
054C:	95 38	STA	#38.X	05A6:	60	RTS	
054E:	CA	DEX	05A7:	E6 E8	INC	#E8	
054F:	10 EF	BPL	#0540	05A9:	60	RTS	
0551:	A5 38	LDA	#38	05AA:	A9 00	LDA	#00
0553:	8D 7A 80	STA	#807A	05AC:	85 E8	STA	#E8
0556:	A5 39	LDA	#39	05AE:	E6 31	INC	#31
0558:	8D F2 80	STA	#80F2	05B0:	60	RTS	

PROGRAM PROTECTION

Attention - Programmers & Software Companies - your worries about unauthorized copying of your programs are over. BC Computing (2124 Colorado Ave, Sun Prairie, WI 53590) will protect your programs for you. They demonstrated their system to me. It is very impressive, and it WORKS!!! Load a protected program by typing L-O-A-D [RETURN]. You will then be amazed to see the program not only LOAD but also immediately RUN!! If the program allows you to break out into the READY mode (the STOP key does not work) the program will not LIST correctly and your PET will be out of control forcing you to turn it off and back on again. A SAVE will not work, neither will the SYS equivalent! Adding this protection is very complex so BC Computing charges a nominal fee for this protection service. Anyone marketing GOOD PET programs now would be foolish not to have BC COMPUTING protect them.

I have heard that a company on the East Coast is also providing a similar service. Their price I heard was about 4 times as much as BC Computings, and I have NOT seen theirs yet to verify that it really does protect programs WELL. BC Computings system mixes up things so thoroughly I don't even know everything they do and they won't tell me.



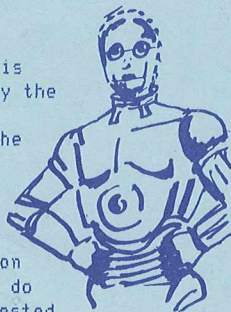
The PET GAZETTE has gone through almost 1,000 cassette tapes now and has tested almost all brands and types. We have found 1 tape that is far superior to ALL the others for use with the PET. These cassettes use "AGFA Premium" tape. Be careful of companies advertising AGFA tapes, there are several different grades. "AGFA Premium" is the best. Just as important as the tape is the cassette housing. Make sure that it is top quality, screw type, steel pins, flanged rollers, and hard window. "AGFA Premium" tape in the highest quality cassette housing is available from COMPUTER WAY. After having problems with other tapes we have now transferred most of our programs and data onto COMPUTER WAY cassettes. Their prices on AGFA Premium C-10 cassettes are lower than others advertised.

- 25 at \$1.00 each (total \$25)
- 50 at \$0.96 each (total \$48)
- 100 at \$0.85 each (total \$85)
- 200 at \$0.80 each (total \$160)
- 400 at \$0.75 each (total \$300)

Approved Computer Clubs receive a 10% discount on orders of 200 or more. Shipping and quick delivery anywhere in the USA is included but boxes are extra. Order directly from: COMPUTER WAY, PO Box 7006, Madison, WI 53707. They accept VISA and MASTERCHARGE.

CORRECTION

FILE MANAGER as listed in the BEST OF THE PET GAZETTE is missing two lines (lines 1380 & 1390). They are exactly the same as lines 10 & 15 in the AUTOMATIC REPEATING KEYS routine below it on that page. That is because it is the same routine. SORRY!



MORE RECOMMENDATIONS

Robert Elliott Purser's Reference List of TRS-80, PET, & Apple II Computer Cassettes may sound like a long title, but the 62 pages of the FEB issue are very good indeed. Excellent graphic illustrations. Very complete list of PET software currently available. Price is \$4.00. Address is PO Box 466, El Dorado, CA 95623.

***** IMPORTANT *****

GOOD NEWS!!! We are trying to get as much information on the PET out to you as possible. The best way for us to do this is to rely on you - to tell us what you are interested in seeing in future GAZETTES - and to send us short articles describing your findings and projects, as well as reviews on products and programs. Our costs are phenomenal. Our mailing list is so large now we pay another company to keep track of it for us. This is expensive for us. (Let us know if you got dropped off the list somehow) We also pay to have it sorted by ZIP codes and mailed for us. Postage and printing costs for thousands and thousands of copies is truly unbelievable and continues to rise. Plus we just found out that it is going to cost us over \$500 just to have an accounting firm figure out our financial status and fill out government forms etc. We now are so big we really should hire a regular lawyer too. These and the many more costs must be met. Your donations are what keep us going. Many ask what donation is reasonable. Five to Ten dollars can do alot to help us get by. These donations keep the GAZETTE free. If we ever do have to charge for a subscription, Your donations can be applied to the subscription price. So you can't lose by donating now.



CURSOR is the short name for a high quality monthly cassette program magazine for the PET. Each month they send out a tape which LOADS easily containing about 6 GOOD programs. I am continually impressed by how good their programs are. Write to CURSOR, PO Box 550, Goleta, CA 93047. Price for 1 year, 12 tapes is only \$33

R E V I E W S

The PET GAZETTE has reviewed almost 200 PET products already. There is no charge to have your PET product reviewed. Simply send a review copy to the PET GAZETTE. It will not be returned.

Readers are encouraged to send in reviews on PET products they use.

We recommend purchasing all your PET products from your dealer. This way you can see that it exists before you buy it. We would like every PET dealer to be a PET GAZETTE, BEST of the PET GAZETTE, and PAK 1 programs distributor for us. So we are offering them quantity discounts that make it hard to refuse. Next time you are in your dealers store check if he stocks the BEST of the PET GAZETTE and our PAK 1 programs. If not, ask him to contact us right away. (Mention to him that we offer him from 60% to 80% discounts and maybe even more!) You and he both are missing out. By next issue we should have quite a long list.

PET GAZETTE DEALERS

BYTE SHOP of Milwaukee
6019 W Layton Ave
Greenfield, WI 53220

COMPUTERLAND
10111 W Capitol Dr
Milwaukee, WI 53222

HOME COMPUTER CENTRE
6101 Yonge St
Willowdale, ONTARIO
M2M 3W2 CANADA

Madison Computer Store
1825 Monroe St
Madison, WI 53711



Thus far the PET GAZETTE has been the work of mainly one man. Now I am starting to get some very good help. Since the PET GAZETTE continues to lose money, you probably already guessed that I have another full time job. I work at DATA CONTROL for the State, from 10 pm to 6 am. I then try to sleep from 7 am till 2 pm. (If you need to call, (608)249-2666 from 2 pm till 8 pm Central Time is the best) I also have a beautiful wife and 1 year old daughter who should be computing very soon.

To serve our readers best, we need a good staff, but not too many people are willing to work free. Till we can afford a real staff, the GAZETTE depends on you to send us singlespaced typed articles and reviews, as well as donations.

Make sure to get your copy of the BEST OF THE PET GAZETTE - only \$10 - from your dealer or direct from us if need be.

TOO IMPORTANT TO WAIT

If you order a BEST OF THE PET GAZETTE or any PAK 1 tapes payment must come with your order. we do not bill ANYONE. This includes schools and dealers. Payment must be in US dollars and drawn on an American Bank. For example - When we cash a Canadian check for \$5 the bank deducts almost \$3 for the conversion.

Name _____
Address _____
City/State _____ Zip _____

AMOUNT ENCLOSED
\$ _____
donation

Please Print or Type
PET GAZETTE, 1929 Northport Dr, Room 6, Madison, WI 53704

REVIEW - \$250 - 8K MEMORY
 Skyles Electric Works
 599 N Mathilda Ave #26
 Sunnysvale, CA 94086

The person who was to do this review has been enjoying it so much for the last month that he has not given us the review. It was apparently very easy to install and works well. 16K is \$450. See their ad for a special Memory/Keyboard offer.

REVIEW - \$5.95 - HOME UTILITIES
 Competitive Software, Rt 1, BOX 356
 Edwardsburg, MICH 49112

Home Utilities is 4 programs assembled to load as 1 program with a menu. The instructions were less than 1/4 a peice of paper. ELECTRICITY asks for your electricity bill and number or kilowatts. Result is then kilowatt per hour cost. It can subdivide this cost per appliance with more input. LOANS figures loans for you. MILES PER GALLON does the few calculations needed for you. But it gave me weird results. I started at 36000 miles. I then went 125 miles and used 10 gallons of gas. It told me my MPG was -3587.5! I then went another 125 miles and used 10 gallons. Now my MPG was 0. SAVINGS took almost 3 minutes to figure out how much money I would have if I invested \$200 for 25 years adding \$1 each year with daily compounding. I thought that was a disgrace. A computer that needed 3 minutes for a simple calculation.

REVIEW - \$175 - KEYBOARD
 EXCEL, PO BOX 1147
 El Cerrito, CA 94530

This is a full size keyboard. However it does not duplicate the PET keyboard. Instead it is an ASCII keyboard with a decoder module. Special PET keys require using a CONTROL key plus another (Hold CONTROL and A for HOME etc). This is not handy at all. The advantage is that it has a REPEAT key. Hold it plus any other key for instant repeat. It gives lower case with shift for upper just like a typewriter. But because of this it is not compatible with CNC's Word Processor Program. It does not come with a case and there isn't a separate numeric keypad.

REVIEW - \$5.95 - DOG RACE
 Sof-Touch BOX 422
 Logan, UT 84321

Dog Race is a simple program where you bet on which of 5 dogs will WIN, PLACE, or SHOW. The "dogs" are graphic symbols that blink as they go around a square track. As they blink fast and overwrite each other it is hard to keep track of where each one is. Instructions are very poor. I could hardly figure out what was going on. They said to make bets in dollars and cents. A bet of .01 was accepted but not subtracted when I lost. It also accepted a bet of a graphic symbol. Payoffs seemed a bit off. A \$5 bet with 5-7 odds paid only \$6.99. Other bets came out a couple dollars off what I expected. You must always hit return after each response. You must shift to enter the graphic symbol for dogs you want to bet on. After each race it listed winnings and final balances but did not list how much anyone lost, only their new lower balance.

PAK 1

FAST service, usually less than 1 week, is the rule with our PAK 1 series however. Send only \$10 for each PAK you would like. There are 6 Programs in each PAK. We are proud of the quality of these programs at such a low price. In the end we almost lose money for each one ordered. Here is what PAK 1 is all about:



EDUCATIONAL PAK 1 - Morse Code uses the GAZETTE sound conventions to send any message you wish. PET also can send random messages to give you practice. Also has a mode to teach you morse code one letter at a time. - Math Drill gives practice in addition, subtraction, and multiplication. - Story Problems is one of our favorite programs. You supply the names of foods, animals, and your friends. The PET creates excellent math story problems with the answer always a whole number. - Capitols includes a clever technique to aid in learning the capitols of the U.S. - Spelling Test allows you to create data tapes of your tests for future use. - Speed Reading is a short exercise to see how fast your recognition is.

GAMES PAK 1 - Mastermind is in one word, FANTASTIC. The PET always seems to break my code much quicker than I can break his. - Acey Deucey is a graphically illustrated card game also known as "in between". - PET Pong is a unique version of the old video game. - Battleship is a good graphic version of the classic game. - Dominoes is you vs the PET. It is assumed you know the rules of the game. - Baseball is a good version of the game as listed Recreational Computing.

MUSIC PAK 1 - all programs use the GAZETTE conventions for sound. PET Organ allows you to use your keyboard to play songs. - Joplin Clock is a fancy alarm clock with a bit of Joplin. - Star Wars Theme, William Tell, Java, and other songs are sung by your PET.

USEFUL PAK 1 - File Manager lets you write, add to, or read data files such as recipes, messages, etc. - Easy Reader is a very short program to allow for quick loading. It reads data files, with sound effects too. - Word Processor by Mike Richter is a good program. Use it to submit articles and reviews on tape for our future issues. - Biorhythm is a good standard program everyone seems to enjoy. - Case Converter is great to convert long instructions in your programs from all capitols into lower case. - Digital Clock allows your PET to become an expensive clock.

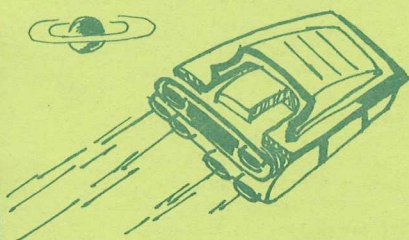
DEMO PAK 1 - Kaleidoscope is a classic program to show off your PET graphic capabilities. - Computer Art randomly walks all over your screen. - ON GOSUB DEMO is meant to show how the command ON ... GOSUB works by using a program that moves a ball around your screen. - Data Entry Demo is a three part program that shows how you can turn your screen into a fancy form with blanks to be filled in. The cursor moves from area to area, skipping from field to field.

BEST OF PAK 1 includes the best program from each PAK plus a DEMO of how to protect lines of your BASIC program from being listed. Included are: Morse Code - Word Processor - Battleship - Kaleidoscope - Star Wars Theme - No List Demo.

Each PAK is only \$10. Send your order with full payment to PET GAZETTE, 1929 Northport Dr, Room 6, Madison, WI 53704.

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 TRY AGAIN? SPRINGDALE
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 NEVADA? LAS VEGAS
 TRY AGAIN? ALBUQUERQUE
 THE CORRECT ANSWER IS CARSON CITY
 NEVADA? CARSON CITY
 NEW HAMPSHIRE?

EDUCATIONAL PAK 1 includes CAPITOLS as one of the 6 programs. Our favorite program in this PAK, STORY PROBLEMS, is shown on page 10. Page 2 shows our WORD PROCESSOR from USEFUL PAK 1. Page 6 illustrates MASTERMIND from GAME PAK 1. Use order form on the right for any PAK 1. Recorded on AGFA tape.



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Please Print or Type

Please send me the following PAKS at \$10.00 each.

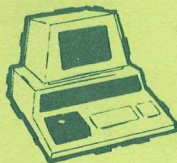
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 DEMO PAK 1
 GAMES PAK 1
 MUSIC PAK 1
 USEFUL PAK 1
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