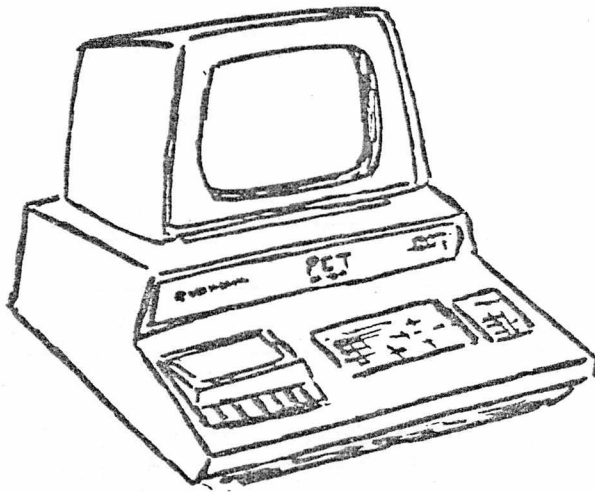


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AUGUST

1978

**ISSUE # 6
VOLUME 1**

READER QUESTIONNAIRE

Please fill out the questionnaire and mail it back to us so we can fulfill your information requirements.

1. Please comment about your level of expertise. What do you know about microcomputers? Do you understand hardware? Machine code? Assembler? BASIC?

2. Do you own or have frequent access to any microcomputer other than the PET? Which ones?

3. Would you be willing to write articles for the PAPER if there were something "in it" for you? Like money or free software or something? What would you write about? What would you want in return?

4. Would you be willing to help form a PET User group in your area? May we give other PET owners your name, address, and telephone number? If so, please give us that information here.

5. Which peripherals would you like to see made available for the PET? What kind of prices are you willing to pay?

EDITORIAL

This month's issue can be a treasure hunt for you. Buried among the PET PARADE letters is the most significant piece of PET information we've received to date: the 'fix' to make PET cassette data files really work reliably. There is also an article on how to adapt an ordinary cassette recorder for use as your PET's second cassette unit - and an article in which some of PET's BASIC is documented. Plus, of course, the usual rich supply of PET tidbits for you to dig through and mull over.

The last month marked a real turning point for THE PAPER. Subscriptions have poured in; we began accepting paid advertising; and most of the material for this issue was contributed by readers rather than written by your editor.

Your response to the questionnaire in the last issue has given us some insights into your needs - and we've reprinted that questionnaire in this issue for those of you who were unwilling to lose valuable information printed on the back of last month's questionnaire.

Several new tapes have been added to our library (I'm especially fond of Hostage) and we've received the rights to an outstanding PET Tutorial, as well as to the first user-oriented machine-language monitor/disassembler we've seen.

Keep those cards and letters comin' in! We'll try to be responsive to your needs.

Hope to see some of you at PC '78 in Philadelphia. Until next month...Enjoy!

AT LAST IT'S HERE

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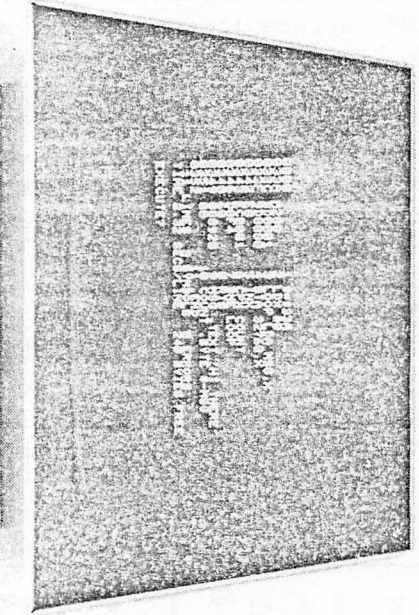
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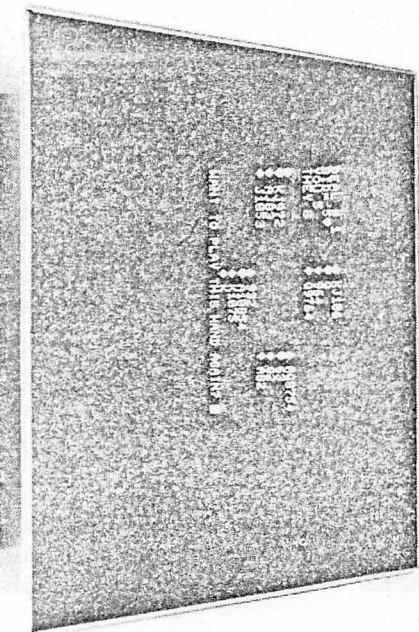


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STANDARD

SYMBOLS

(H) Cursor HOME
 (C) CLEAR Screen
 (R) Cursor RIGHT
 (L) Cursor LEFT
 (U) Cursor UP
 (D) Cursor DOWN
 (F) Reverse Field ON
 (S) STOP

(O) Reverse Field OFF
 (Ⓞ) Carriage Return
 (↑) Shift ON
 (↓) Shift OFF
 (∕) Delete
 (I) Insert
 () Space
 (*) Shifted RUN/STOP (for Load & Run procedure)

USER GROUP INFO

Glenn Schwartz, 807 Avon, Philadelphia PA 19116, is willing to help start a PET User's Group in his area. Please Contact Glenn for more information.

ACGNJ meets 4th Fridays. Call John Loofbourrow at (201) 233-7068

SPHINX 314 10th Ave, Oakland. Call (415) 451-6364

The Human Society - United PET Users meets 1st Thurs. 1929 Northport Dr. #6, Madison, WI 53704. Call (608) 249-2666

PET Users in the Twin Cities, MN area call John Fung (612) 376-5465

Peter Oakes, 2235 Lakeshore Drive, Muskegon, MI 49441, is willing to help form a PET owner's Group in his area. Write for details.

Sacramento PET Workshop P.O. Box 28314, Sacramento, CA

PET Users 2001 Bryan Tower, Suite 3800, Dallas, Tx 75201

PUG meets 1st Wed. in the Mercury Room, 310 Showers Dr. Mountain View, CA

BAMUG 1450 53rd St. Emeryville CA. Call (415) 523-7396

North Orange County Computer Club, David Smith, 3030 Topaz Apt A, Fullerton, CA 92631

PET PROSE

There are many people who want specialized application programs to use on their PETs, but who are not knowledgeable enough to design or to write them. If you can write significant software in some specialized field (i.e., education, engineering, business or something else) and are willing to do so, we may be able to help you find the people who are willing to pay you to write programs for them. Send \$25.00, your name, address, phone number and field of expertise. The information will be published in all remaining issues of this volume of the PAPER.

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THE PAPER is published ten times per year and mailed to subscribers on the last day of each month except July and December. Single copy price is \$2.00 per issue, subscription price is \$15.00 (all ten issues of one volume). Dealer prices upon request. Outside USA and Canada, add \$10.00 per subscription postage (\$1.00 postage per single issue).

Readers are encouraged to submit articles of general interest to PET owners. Material submitted will be considered free of copyright restrictions and should reach us by the 10 day of the month in which publication is desired. Non-profit organizations (i.e., computer clubs) may reprint any part of the PAPER without express permission, provided appropriate credit is given with the reprint. Any other persons or organizations should contact the editor before reprinting PAPER material.

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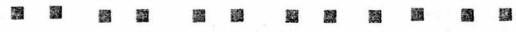
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THE PAPER is an ARESCO publication, edited by Terry Laudereau. For further information, contact Editor, THE PAPER, P.O. Box 43, Audubon, PA 19407

Associate Editor: Rick Simpson

PET PARADE



Terry - Thank you for the improved version of Home Data Retrieval. It solved the initial record problem, but it still would not find the EOF. Thank you also for the corrected version of the Data Edit program which I received today. It also has a problem finding the EOF. May be my PET, being one of the early models is a little different. Now for specific comments:

Data Retrieval: I added line 3145 B\$=B\$+"#"
so that when adding a file or listing, I would find the EOF. This seems to have corrected the problem, making all parts of the program work as expected. For some reason, ST seldom comes out to 64, so some backup method must be used.

Data Edit: I had a long letter almost finished on needed corrections to the first program. I only lacked the solution to handling notes without unusual results on occasion, so I was doubly glad to get the new tape. When adding from an existing file (option 4), I will get one of two results. A) the tape will just keep running after the data is found and displayed, or B) I'll get a "?STRING TOO LONG ERROR IN 2050". This happens when I leave the recorder on in PLAY all during the retrieval; however, if I stop the cassette recorder after each time the tape moves, then start it again when instructed, I find the EOF and everything terminates normally. I haven't yet tried creating a file on the Data Retrieval Program and then recovering on the Data Edit. Maybe I will get a clue from that effort.

Thanks again for the special effort you have made to keep me informed. Your programs have certainly been educational. If it weren't for you and THE PAPER, I would still be woefully ignorant of some of the possibilities of the PET. It's a great little machine, but the knowledge of how to use it has been hard to come by. - Louis A Barnett

Louis - Thanks. We've added your corrections and followed your suggestions. Did the Data Edit recover files created in Data Retrieval? - Terry

Terry - Pass this on to the letter-writer with the ARCOS routine and no name:

```
DEMO FOR ARCOS(X)
10 INPUT "DEGREES,1 RADIANS,2";K
20 ON K GOTO 30,50
30 R=180/PI :PRINT:PRINT" ","DEGREES"
40 GOTO 100
50 R=1:PRINT:PRINT" ","RADIANS"
100 DEF FNG(X)=ATN(SQR(1-(X)*(X+1E
-15)/(X+1E-15))
110 DEF FNR(X)=INT(1E3*X+.5)/1E3
120 PRINT "X","ARCOS(X)"
130 FOR X= -1 TO 1 STEP .125
140 IF X<0 THEN XA=PI
150 IF X>0 THEN XA=0
160 PRINT FNR(X),FNR((FNG(X)+XA)*R)
170 NEXT X
180 RETURN
```

When you run subroutines from the keyboard, it returns command to the keyboard if you use GOSUB XXX instead of RUN.....a useful trick in checking through subroutines. - Frank Alexander (F(X))

Thanks, Frank! The letter-writer is Peter Oakes, whose name appears at the end of his letter - on page 5. - Terry

Terry - I have enclosed a tape of a program which I have written called MICROMAZE. The program is a game in which one person plays against a clock in trying to direct a ball out of a maze. The maze is a collection of blocks which the PET puts on the screen through POKE statements. I put in a lot of REM statements for ease of program understanding, but they seem to slow the program down.

For my own use, I have written a machine language subroutine in which a speaker makes a tone whenever the ball hits an obstacle. I would be happy to send this if you want it. - Glenn Schwartz

Glenn - Of course we'd like to see your subroutine! You should have received our letter re: Micromaze by now. We like it! - Terry

Terry - I am getting a little peeved at your negative attitude toward PET and Commodore. PET is a super product

PET PARADE

by my experience. Commodore has been very helpful to me...They should not be expected, at the price of the PET, to help us individually with software problems.
- Larry Stevens

Terry - Normally I do not have the time to sit down and write a letter, but I thought I might help a bit with a technique I use to overcome problems with my data files.

First off, my compliments; your PAPER is shaping up real fine. It has usually resolved problems for me that I could not find the solution to on my own. Keep up the good work.

In your notes on the Status Word (ST) in the July issue, you use the logical AND operation to check the status. I have found that this does not work in all cases on my machine, whereas:

```
IF(ST)=64
```

will work. Whether or not this is unique to my machine, I am not sure, but I wanted to mention, in response to your article, that the above code does work.

The main reason for my letter is data file problems. I have been using data files heavily with my machine, and have been running into all of the problems with data loss, EOF marks missed, and a variety of other phenomena that all PET users seem to be experiencing.

I now use a standard routine to forward the tape about 15 jiffies every time I recognize that a block has been written. A block has been written when it takes longer than 2 seconds to return from a GOSUB routine which I branch to after each output of data. For example:

```
10 TT=TI: PRINT#1,A: GOSUB 500
```

```
  :
```

```
500 TT=TI-TT
```

```
510 IF TT 120 GOTO 600
```

```
520 TT=TI
```

```
530 POKE 59411,53
```

```
540 T=TI-TT
```

```
550 IF T-T < 15 GOTO 540
```

```
560 POKE 59411,61  
600 RETURN
```

This is laborious to do for each write, but it doesn't take much execution time; only the time to code it. I lower the coding time by doing all of my writes in one section and then duplicate the code, changing the variable names that I want to write out.

This solution worked fine when I used a brand-new tape. But after writing several files, several times on a tape, I began to experience data loss problems.

Not being much of an internal code programmer, I sought to remove the data loss problem by clearing the tape.

I wrought a program to initialize a tape before using it, by writing blocks of cleared records. This worked fine, and only once in a while would I experience a data loss. (That "once in a while" occurred most often when the data would really be needed and I would have the least amount of time to reenter it. I think this has something to do with Parker's law.)

After thinking about the problem a while, I reasoned that the PET has very little trouble loading a SAVED program, and I should perhaps use the SAVE operation to initialize the tape. I tried it. It works like a charm. The following code clears one of my tapes in approximately 20 minutes (this is about 125 SAVES):

```
10 SAVE"",1,1
```

```
20 GOTO 10 /
```

Now, after using a tape a couple of times, and wanting to reuse it again, I just initialize it as shown above, and it works fine. I suspect that a data tape which has been used several times leaves garbage in the inter-record gaps which can be picked up by the operating system and cause it to come to a grinding halt.

I offer the above as a solution to data file problems. I can't guarantee that it will work on all PET systems, but it certainly works on mine!

One other thing - rather than hang the system when it crosses an EOF or EOT

PET PARADE

mark, I just use the end-of-file OPEN. That is, instead of OPEN 1,1,2,"NAME" I use OPEN1,1,1,"NAME". As you might have noticed, I use the same on the SAVE command. It eliminates a lot of problems when searching for a file or a program. I hope this helps some other users. - Dennis E. Kosack

Dennis - You bet it will help! I think you may be right - PET may be picking up garbage in the IRG. We have found that using the EOT command, OPEN 1,1,2,"NAME" works better on our PET than the EOF command. We have also found that if we open a file by name, we have less trouble reading all the data than if we just use the default command, OPEN1. Thanx. - Terry

Terry - As a matter of interest, I am enclosing a copy of a letter I sent to Money Magazine in regard to PET. Money responded:"...The editors have chosen not to publish your letter."

I and some of your other readers would be most interested in ways to glean stock market information on Commodore. As a small company, not much is published about it. NCS seems to be the only advisory group touting the stock. Are there others? Information on backlogs, consumer reaction, software delays, etc., would be most helpful to investors - present and potential. - George Severance

George - I don't know of any other advisory group. Perhaps if any of our readers know of such a group, they'll let us know. Your letter to Money arrives at an interesting time. We have heard from many people who are ready to sue Commodore for fraud or misrepresenting the PET - and we've heard from others who are prepared to return their PETs to Commodore permanently, since they don't work right when they're returned from the Service Department for the fourth time.

Since I believe your point of view has something to be said for it, as well, I am herewith printing your letter to Money (exclusive of headings

salutations, whistles, and bells:

"Editors, Money Magazine

"Your derogatory article on the PET Personal Home Computer (May '78) is the most short-sighted, tunnel-visioned piece of journalism I have ever read. You sound like the guy at the Patent Office in the early days of our great country's development, who wanted to close it up because everything had already been developed.

"My own liberal education and background includes exposure to the following disciplines: Accounting, bookkeeping, engineering, music, investing, mathematics, game playing, chess, foreign languages, word processing, teaching, tax accounting, personal budgeting, stock options, biorhythms, inventory control, etc.

"The home computer, properly programmed (the software programs are available if you would take the time to look) is a natural for all the above applications. And that's just for openers! What do you suppose is going to happen when two of the world's most powerful forces - the human brain and the power of the computer - are put together on a mass basis?

"I look forward to the day MONEY recognizes the monumental impact the personal home computer industry will have on the geometric technological growth of our country and the world. The significance of the home computer is on a par with the invention of the wheel, printing press, and the airplane. The action of Commodore Intl common stock (AMEX, CBU) would seem to indicate that an interesting number of the investing public agree with me.

"I anticipate an early retraction of the article and apology to your readers for misleading them.

A happy Pet Owner, George G. Severance"

Terry - I have written what I consider to be a very good TANK WAR. I would like information on how to sell it through the PAPER. Please tell me what royalties I would receive and all other terms. - Steve Young

Steve - All you have to do is to submit your

PET PARADE



completed program, on tape. We keep it for several days to evaluate it, and when we make a decision on it, we send you a contract. Our usual terms are 20% of the retail price for royalties. If documentation is required, you must provide a master copy of that, too. For instance, a pre-program programmed instruction set is most helpful. Try to be sure your Software Shelf hopefuls are as "bullet-proof" as possible - that it doesn't let the user "fall through" a carriage return, that it handles the User's input errors, and that it doesn't try to REDIM an array (that's the most common programmer problem we've encountered!)- Terry

Terry - Solved the EOF problem on Data Edit by substituting a `CHR` for a `CHR` in line 4930. It now reads

```
4930 B$=B$+"CHR":GOSUB1040:CLOSE1
```

Seems to work when files are manipulated in Home Data Retrieval after being created in Data Edit. - Louis A Barnett

Thanx again, Louis! - Terry

Terry - Please send price list and descriptive information on the following:

1. List of known PET User Groups
2. Articles on PET Basic
3. PET hardware and software notes
4. Reviews of all known and available PET cassette programs
5. Sources & costs of PET peripherals and accessories
6. Comments and condensations of nationally published articles of interest to PET owners
7. Information on "Flea Market Software Exchange Library"

Thank you - Verdun L Place

Verdun: How much would it surprise you to know that almost every PET owner is looking for the same infor-

mation you're looking for? Try the PET GAZETTE (see PAPER Vol 1 #5), try contacting Robert Elliott Purser, P.O. Box 466, El Dorado, CA 95623. Bob publishes "The Most Incomplete List Of Software In The World" or "The World's Most Incomplete Software List" - and it contains a mention of almost every cassette program I've ever heard of, and then some. But it's not an exclusively PET program list.

The PET Gazette is free from Len Lindsay, 1929 Northport Dr #6, Madison, WI 53704.
- Terry

Terry - I like the 8½ x 11, punched hole format. Suggestion: Invest in a big FIRST CLASS rubber stamp. Postmark 8/3, delivery 8/7 on last issue. And 41¢ postage - WOW! No wonder you ask 15\$/year! Fast turn-around is worth it though. Thanx for the extra issue.

PET decoded, etc., ad Xeroxed from Kilobaud. I haven't seen how good it is - only intended for your info.

cf p 4 of Vol 1 issue 5: Arcsin/cos routines are computationally bad. Kilobaud had these a few months ago, and printed my suggestions on them afterwards. The problem is that when /S/ is close to 1, you lose accuracy needlessly. I suggest that instead, you use the formula

$$\tan \frac{\theta}{2} = \frac{\sin \theta}{1 + \cos \theta}$$

to get

$$\theta = 2 \arctan \frac{S}{1 + \sqrt{1 - S^2}}$$

and set up in BASIC as

$$\theta = 2*ATN(S/(1+SQR(1-S*S)))$$

θ in radians; OR

PET PARADE

$$\theta = \frac{180}{\pi} \text{ \& ATN ...}$$

for θ in degrees.

In any case, the formulae

$$\text{ARCCOS}(X) = \frac{\pi}{2} - \text{ARCSIN}(X)$$

(radians)

$$\text{ARCCOS}(X) = 90 - \text{ARCSIN}(X)$$

(degrees)

gets arc cos from arc sin. When I get the PET printer, I'll run off some comparisons of accuracy - let me know if you're not interested.

K'baud also has had other awful suggestions about doing arithmetic, but they don't seem to be very interested in doing better.

The enclosed PET BASIC documentation should help out your correspondent A. Nony Mous. - Charles A. Mc Carthy

Terry - Thanks very much for forwarding my inquiry to SPHINX. Above & beyond the call of duty. You should be getting soon the first issue of MUPET newsletter. Contact John Fung if it doesn't arrive within a couple of weeks.

Want info on 6502 programming & hardware? Suggest contacting the second sources, Rockwell or Synertek. Examples:

a) Asked MOS 3 months ago on typed letterhead for a price list of manuals. (I wasn't even trying to chisel a free one) No answer. I've found out since that they cost \$10.00 each.

b) Found outh through MUPET that Rockwell has the same stuff @ \$5.00. One week turnaround - they sent the manuals first-class mail!

c) Local R & D firm has had very good response from Synertek; I think they want \$6 for their manuals, but I'm not sure. Check this out. All addresses, phones, are in Osborne's "Microprocessors - Some Real Products" (Volume II.

Local R & D firm has same printing mechanisms that go into PET printer, may consider interfacing with more capability than Commodore's printer (it looks like Commodore only allows one - maybe 8 or 16 - user generated character at a time)

.....

and maybe without the spaces between lines that can't presently be printed even if you try. Don't hold your breath, though. But I'll bet lots of other firms are going to look into this, too. The mechanisms cost about \$500 (40 column) or \$250 (80 column) in OEM (at least 500 or a thousand) lots, so less than \$500 seems like a reasonable target price. See product announcement in latest Interface Age for correct details.

Comment on pages 10 & 11 of latest PAPER: History has shown that the True God is the one with the largest number of devoted, well-armed followers.

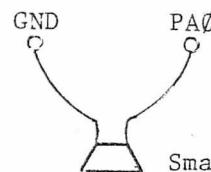
Sorry not to have the time to type all this up beautifully for you. When I have time in the future, I'll type.

- Chip Bitly

Chip - Having two anonymous correspondents in the same issue will make things confusing unless I use two names to identify you! You know who you are, and if I receive any reader responses, I'll forward them to you. For you readers who aren't familiar with John Fung, he's leading the Minnesota Users Group, and you can get his address from the User Groups column. Thanks, Chip, for the 6502 manual info - we've had a lot of inquiries about them. - Terry

Terry - the new format of THE PAPER is much better. In some future issue, could you give the method of generating music through the CB2 line using the square wave?

I currently have a speaker attached to PA0, and it works via a small machine code subroutine which oscillates the line, causing a tone output:



Small earphone speaker

PET PARADE

LABEL	MNEMONIC	HEX	DECIMAL
INIT	LDY (1mm) 00	A0 00	160 0
	LDA (1mm) 01	A9 01	169 255
	STA DDRA	8D 43 E8	141 67 232
START	INC ORA	EE 41 E8	238 65 232
READ	LDA XXXX	AD 3A 03	173 58 2
	EOR	49 FF	73 255
	LSR	4A	74
DELAY	TAX	AA	170
	DEX	CA	202
	BPL DELAY	10 FD	16 253
	INY	88	136
	BEQ 03	F0 03	240 3
	JMP START	43 3E 03	76 62 3
	RTS	60	96

Start address is
827 (decimal)
33B (hex)

Varying 826 decimal by
a multiple of 4:
POKE 826,4*C
and jumping to 827 in a
program, will cause the
speaker to play a tone:
300 POKE 826,4*C
310 SYS(827)

By GLENN SCHWARTZ

Glenn - Thanks. I hope the reader can find your name up there - you do deserve all the credit in the world for hunting this one up! - Terry

Terry - We just received Vol 1 Issue #5, and enjoyed most of it, as usual. With a couple of "howevers":

You told Jerry Velders it was necessary to buy cassette recorder #2 from Commodore, although Russell Martin in Issue 3 of the PET User Notes (P.O. Box 371, Mon gomeryville PA 18936) describes an interface thru which he has been using a non-Commodore second tape recorder.

I thought the Renumber and Unlist programs were just what I needed, until I tried the listing program to create the file to use Unlist on:

```
1000 OPEN 1,1,1:CMD1:LIST
1010 FOR I=1 TO 200: PRINT#1," ";:NEXT
1020 PRINT#1,:::CLOSE1
```

as suggested in the remarks of Unlist. There seem to be two problems: my PET will not return control to the program after a LIST; and CMD1 seems to mess up further operations from the keyboard. If I write a program with LIST in it, in any of its forms, the listing is done all right, but then control comes back to the keyboard, not to the next program statement. So when I try the above program, statements 1010 and 1020 are

not done, so the buffer doesn't get cleared, or the files properly closed. Then, when I try to do something about it, everything behaves very strangely: LIST doesn't do anything, and RETURNS don't give the normal carriage return-line feed combination. The only way I could find to restore normal behavior was to turn the PET off and on again.

If Mr. Bussey can get the program to work all right, then I suppose we have a ROM error in LIST. As for the other difficulties, they may just be from ignorance about how CMD is supposed to be used, or how to cancel it. Do you know of any source of information about that? Is the LIST problem just a matter of getting a later ROM?

Your PAPER is very helpful. I wish the explanations could be a little clearer (Mr. Bussey's instructions on how to use his UNLIST program, for instance), but I suppose there's always room for improvement. - Jim Parr

Jim - It is true that you can build a second cassette interface following Russell Martin's instructions - but nothing recorded from that recorder will be readable from any other PET recorder. - At least, that's the way Commodore planned it. Since we haven't built Russell's interface, we don't know that that is a fact, however. We'll check it out for you ASAP - Terry

PET PARADE

Terry - I am the owner of a PET 2001 Series personal computer manufactured by the Commodore Business Machine Co. in Palo Alto, California, and purchased from National Corporate Sciences of New York City.

I am an investment advisor and commodity trader and the machine was purchased with this in mind based on both Commodore Business Machine and National Corporate Sciences claims as to what the machine would and could do. National Corporate Sciences are investment advisors, as well as being a Commodore dealer.

My machine had been sent to Commodore's facility in Norristown PA to try and remedy what I am now learning is a faulty design, pure and simple. Attempting to maintain data files on a regular basis is impossible.

I am not a computer hobbyist. This machine was purchased to do a specific job, and that is just what it will not do. My programmer has discussed the situation repeatedly with Commodore in Palo Alto, and has gotten nowhere. His last remark to me was, "It's about time they meet Ralph Nader."

I believe it goes beyond this, and since I have not even received the courtesy of a reply to my letter to Commodore, I have discussed the matter with my attorney in Fort Lauderdale, a former Attorney-General of the state of Florida. He has indicated that there are grounds for a class action suit. Personally, I would be content to just recover my money (for who can compute the value of my lost time and aggravation?), but from your newsletter, there seem to be myriads of others in my same position.

With this in mind, anyone wishing to contact me in pursuing this matter to a just and equitable solution may do so at P.O. Box 1826, Winter Park, FL 32790. - Oliver H Smith, Jr.

Oliver - In the last week, we have received calls from two other readers who feel about the situation as you do.

No doubt one of them (and probably both) will contact you. Will you keep THE PAPER informed? We'd like to know what progress you make. Would you be content if Commodore fixed the faulty design so you can maintain data files? It's possible that the knowledge that they are in imminent danger of being sued will get them off the stick. Let us know what happens. We support the PET - not the company. - Terry

Terry - The PET Group here in San Antonio meets the second Friday of each month in a rather informal manner. We move around to each other's homes in town, and usually about half will bring their PETs with them. The PETs are set up on the available furniture and told to show off their tricks, and in the manner of all other micro groups, there is a great deal of program swapping and exchange of recently gathered information. There is no structure to the group, but if any PET enthusiasts in the South TX area are interested, a call to me at 226-3542, or the to Computer Shop here in San Antonio, will get the location and time of the next meeting. - Lawrence Williams

Larry - Thanks for letting us know - please send us copies (and prices) of your group's newsletter, if one is published. We'd like to share your discoveries with other groups. - Terry

Terry - An interesting thing you might like to know about is that here in Paris I saw a PET on sale in one of the large department stores for 7850 francs, which at the current exchange rate is \$1776. Now I appreciate having bought my machine in the States for \$795. - Al Glock

Terry - The PET keyboard is easy to disassemble with a small phillips-head screwdriver. The contact PC board is gold plated. Removal and cleaning lightly with an eraser is simple, and there isn't the problem of 77 parts flying around loose. Individual keys may be pried out from the front without keyboard removal. Many jewelry stores can replat the gold if necessary. I will advise you on outcome of Newman IBM Selectric with PET interface. - Hunter Bell

* * * * *

FLEA MARKET

The purpose of the Flea Market Exchange is to encourage people to write software and to share it with others.

In keeping with this spirit, the Flea Market Library programs are intended to be exchanged on a one-for-one basis for new programs. We do ask that you send \$2.00 to help cover our expenses (the price we have to pay for working with large volumes of cassettes; including, but not limited to the tapes, labels, mailers, duplication costs, etc.)

If you don't have a program to exchange, we'll sell you a Flea Market program - for \$5.00. We do not guarantee that the program will do anything other than load and run. We do not provide documentation, and the author may or may not have included instructions in the program itself.

Program tapes are mailed, first class, within a week of receiving your order. If you order more than five tapes at a time, we'll try to ship them UPS, since that is usually faster and safer than US mail. Be sure, then, to give us a street address - UPS will not deliver to a post office.

See Issues #1 through #5 for a description of the following programs:

SNAKE	RENUMBER & LIST
YAHTZEE	PRIME NUMBER
SPADES	DIGITAL CLOCK
SPIRAL	MORSE CODE TUTOR
RND CHAR	VACATION BUDGET
AIR WAR	ADDITION GAME
CODES	OTHELLO FOR ONE
GRADES	OTHELLO FOR TWO
HEX/DEC	SLOT MACHINE
EMPEROR	KLIDISKOP
DARTS	KYBD UTILITY
MAXIT	TYPEWRITER-5
HIMONDIS	USEFUL ROUTINES
LOMONDIS	ROAD RALLY
DOGFIGHT	STATES & CAPITOLS
HANGMAN-G	SPACE CONVENTION
MATH QUIZ	MAGIC SQUARE

* * * * *

BIOCYCLE - displays only the critical days
AMORTIZATION - Amortizes loans

NOTE - Plays music with the help of a transistor radio held near the keyboard

PUBDOMDIS - disassembler

CORE DUMP - Look at memory

NUMBER TRAP - Trap PET's secret number between two guesses.

TIC-TAC-TOE

TOMMY TERMITE - "eats" a path at random to the corner occupied by the players. Up to 4 players. Good for small children.

DAY_OF THE WEEK - Calculates any day of the week for any date since 1752.

CLOCK-12 - Keeps track of time, date, and day.

DAY/DATE/TIME - Similar to CLOCK-12

TI\$,TI TUTOR - Brief instructions about how to use the PET's clock variables. Listings & examples given.

MAZE DEMO - Draws a maze. No game.

CHECKERBOARD DEMO - Draws a checkerboard. No game. Program will move tokens around on the board.

SEPTEMBER SPECIALS

FOUR TAPES FOR \$15.00 SEPT ONLY

FLEA-PAK I: HAIKU, HI-LO, HANGMAN (not the same program as HANGMAN-G), and COMPUTER HAIKU

FLEA-PAK II: MAZE DEMO, HURKLE, SEA WAR, CHECKERBOARD DEMO

FLEA-PAK III: CHECKBOOK, MATCHES, STARS, TIC-TAC-TOE

FLEA-PAK IV: DAY/DATE/TIME, TI\$ & TI TUTOR, DAY OF THE WEEK, VACATION BUDGET

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

CHECK, MONEY ORDER, BAC, VISA, MC _____

BAC/VISA/MC # _____

EXPIRATION DATE _____

IF MC, GIVE INTERBANK # _____

To order, circle programs desired, send this page to us with payment.

SOFTWARE SHELF

Software Shelf programs purchased after September 1 will be mailed with all necessary documentation. In some cases, no documentation will be necessary because the author included instructions in the code of the program. In some cases, only instructions will be sent, and in other cases, a program listing will be sent.

BLACKJACK	\$10.00
BLOCKADE	\$10.00
CHASE	\$10.00
DATA EDIT	\$10.00
DATA RETRIEVAL	\$10.00
DEFLECTION	\$10.00
SPACE FIGHT	\$10.00
STAT I	\$20.00
STAT II	\$20.00

See issues #1 through #5 for descriptions of the above programs.

New additions include:

HOSTAGE \$ 7.95

Terrorists have seized a group of innocent people, holding them as hostages until their demands are met. You, as governor, are supposed to do something - but what? Your chances of being re-elected depend upon your ability to make the correct decision. What will you do? Non-graphic.

STARTREK 2001 \$10.00

America's favorite computer game is available with sound! It uses the sound circuit described in #1 issue of THE PAPER. And if you don't have the circuit, it's still a fun game. Instructions mailed separately. Fair graphics.

AIR-SEA WAR \$ 7.95

Your naval fleet is at war with enemy aircraft! Will you destroy them before they destroy your entire fleet? Good graphics.

MICROMAZE \$ 7.95

PET builds a maze and times you as

you try to find your way out. Are you bright enough to beat the world record? Each maze is different, so it won't help to memorize the route! Instructions included. Good graphics.

XMON \$15.00

Machine language monitor and disassembler with an exciting difference: The user is actually encouraged to make use of the program! A 'menu' is displayed after each command is executed, so you don't have to remember the commands. Each command prompts you for the correct entries. The entire package is written in BASIC, not in machine language, so you can see how it is done. Best of all, it comes with four typewritten pages of documentation and a listing of the BASIC program! The functions it performs are similar to HIMONDIS and LOMONDIS in our Flea Market Exchange Library (which do not come with documentation):

1. Write to memory
2. Examine memory/disassemble
3. Save memory on tape
4. Load from tape to memory
5. Execute the machine language program.
6. Return to BASIC

If you ever intend to do machine language programming, this is a must!

Please ship the following Software Shelf programs. Full payment is enclosed.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

MC/VISA/BAC # _____

EXPIRATION DATE _____

REQUIRED CREDIT CARD SIGNATURE: _____

PROGRAM NAMES: _____

REVIEW: COMPUTONE & COMPUVOX

By Rick S Simpson

Computone is an audio amplifier to attach to the shift register output pin of the User Port. The documentation provided thoroughly explains how to program that pin to produce a variety of noises (tones). No volume control is provided. If an inexpensive amplifier and speaker is worth \$15.00 to you, we can recommend the Computone.

Compuvox is described as a 'voice input peripheral' for the PET. In operation, it works like this: If there is a noise (like a voice) in the vicinity of the Compuvox, it puts a logic 1 on a pin of the input port. If the noise stops for a moment, the pin goes to logic 0. Thus Compuvox can count how many words are spoken (if the words are spoken distinctly and there are no other noises in the background). Compuvox, of course, can tell nothing about the content of the words, just how many were spoken. No sensitivity control is provided.

There are several good things to say about these products:

- 1 - They both work as advertised.
- 2 - They are both well-documented.
- 3 - They both have supporting software.
- 4 - The software does load and run.

There are several not-so-good things to say about the products, too:

- 1 - Compuvox didn't work when we got it, due to poor soldering on one of the connectors. This was especially frustrating since we weren't quite sure how the unit was supposed to work, and the bad connection was intermittent. We spent half an hour shouting - first into the unit to try to get it to work, and then at it because it wouldn't.
- 2 - The software provided with the units consist of two pretty good games. However, the games

don't particularly show off the capabilities of the units. Computone & Compuvox are manufactured by Microsignal, P.O. Box 161988 Sacramento, CA. Computone is priced at \$15. and Compuvox at \$30. Connectors extra.

* * * * *

NEW PRODUCT ANNOUNCEMENTS

Channel Data Systems announces a comprehensive hardware/software reference service for users of the Commodore PET. It is to be a user-oriented directory of PET related products, including software, hardware and peripherals, literature and periodicals of special interest to PET users, listings of user groups and distributors, and cross references by product type and supplier. The \$19.95 price includes update service through calendar year 1979, from Channel Data Systems, 5960 Mandarin Ave., Goleta, CA 93017.

* * * * *

EDITOR'S NOTE TO READERS

PLEASE FILL OUT THE READER'S QUESTIONNAIRE ON THE INSIDE FRONT COVER OF THIS ISSUE, AND RETURN IT TO US AS SOON AS POSSIBLE. WE HAVE OUR DISK SYSTEM ALMOST READY TO GO, AND WE WANT TO BE SURE THAT ALL OF YOU WHO WISH TO BE INFORMED OF OTHER PET OWNERS IN YOUR AREA, AND ALL OF YOU WHO WANT TO BE CONTACTED BY OTHER PET OWNERS, GIVE US YOUR WRITTEN PERMISSION TO SEND YOUR NAME TO ANOTHER READER.

PET SCHEMATICS

Another First From "PET-SHACK".

For only \$34.95 you get:

24" x 30" schematic of the CPU board, plus oversized schematics of the Video Monitor and Tape Recorder, plus complete Parts layout—all accurately and painstakingly drawn to the minutest detail.

PET ROM ROUTINES

Another Breakthrough From "PET-SHACK".

For only \$19.95 you get:

Complete Assembly listings of all 7 ROMs, plus identified subroutine entry points; Video Monitor, Keyboard routine, Tape Record and Playback routine, Real Time Clock, etc.

To entice you we are also including our own Machine Language Monitor program for your PET using the keyboard and video display.

You can have the Monitor program on cassette for only \$9.95 extra.

Send check or money order

TO: PET-SHACK Software House P37
Marketing and Research Co.
P. O. Box 966
Mishawaka, IN 46544

INTERFACING AN AUDIO CASSETTE DECK TO THE CASSETTE I/O PORT
By Russell Martin, Reprinted from Issue #3, PET User Notes

It is useful to have two tape record/playback units interfaced to a micro-processor. It facilitates file editing and allows the use of the one unit for programs and the second for the data files used by the program. An added advantage for PET owners is that the second tape unit can have useful features which the tape deck that accompanies the PET lacks.

A quick experiment shows the tape deck that comes with the PET works perfectly when attached to the second tape I/O port of the PET. This indicated the machine treats both ports the same, at least on a hardware basis. The operating system software (or, if you prefer, firmware) favors the #1 tape, with various defaults on OPEN statements, etc., going to it. However, this does not affect our interfacing effort, which is a hardware exercise.

An examination of the none-too-plentiful documentation which Commodore provides with the PET shows that the tape I/O port consists of six lines. The A line is ground, which should be self-explanatory. The B line is +5 volts (DC) which can be used to power the limited TTL logic used in the interface. The C line puts out +6.6 volts DC (approximately), which is also used to power the motor of the #1 tape drive. This line cannot be used to power the #2 drive in most cases. Many tape recorders use higher voltages and cannot be driven by +6.6v. Even those that normally operate on 6 volts often are unable to draw enough power from the PET port to run at a constant tape speed, which is a necessity. However, this line is still useful, as will be seen later. The D line is the read line over which data is sent from the tape unit to the PET. The E line is the write line over which data is sent from the PET to the tape unit to be recorded. The F line is the sense line which tells the PET when to start the tape unit running. In the PET's #1 tape drive, pushing the PLAY button closes a switch to which the sense line has been

connected to ground. When the PET senses this, it turns on the +6.6v power to run the tape drive motor.

The figure shows the circuitry for an interface which can be used with any good quality (about \$40 retail) mono cassette recorder. It works as follows: An STSP switch is closed to ground from the sense line, after the recorder's controls have been set appropriately for record or playback. The six volt output from the motor line activates a relay which closes the remote control switch of the recorder. This turns on the recorder. The write line can come directly from the I/O port into the auxiliary (AUX) input of the recorder. The output from tape playback comes from the earphone output (EAR) through a signal diode, across a Zener diode (4.7 volt) and a 1000 ohm resistor, and into both inputs of a Schmidt trigger NAND gate. This digitizes the signal, which is otherwise too sinusoidal for the PET to read. The NAND gate's output then goes to the read line of the I/O port.

I have been using this interface for a month with quite satisfactory results. Files recorded with either tape unit can be played back on the other. My #2 tape deck has selectable Automatic Level Control or manual level control for recording. I use the latter with volume set to slightly more than half maximum. It also has a tone control which I have set to high, although I do not believe that is critical. I run the tape recorder on AC. Of course, shielded audio cable is used for the data transfer lines. I used a Cinch 251-06-30-160 edge card connector. Other parts, except for the Schmidt NAND gate and Zener diode, are available at Radio Shack.

I would like to thank Allen L Chesley for his assistance in the design of this interface.

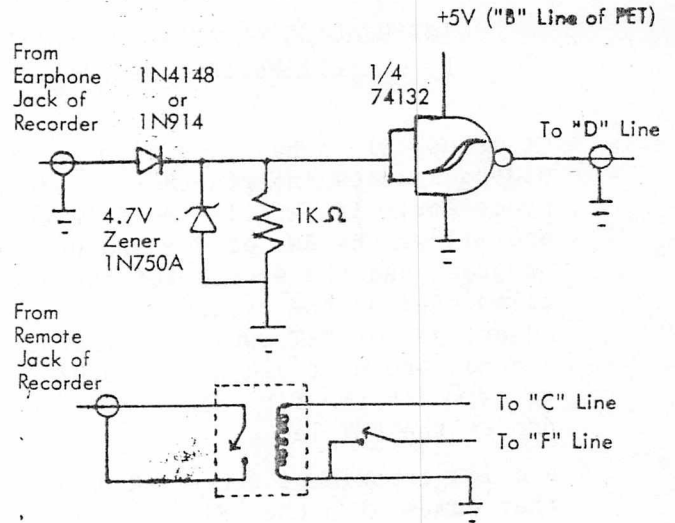
(ED. NOTE: Our thanks to Gene Beals, publisher, PET User Notes!)

Parts List:

- 1 74132 TTL Quad 2 Input Schmidt NAND Gate
- 1 1N4148 or 1N914 Diode
- 1 1N750A 4.7 volt Zener Diode
- 1 6 VDC SPDT Relay (Radio Shack 275-004)
- 1 1K Ω Resistor $\frac{1}{4}$ Watt)
- 1 SPST Switch (mini-toggle switches are nice)
- 1 Edge Card Connector (Cinch 250-06-90-170 or 251-06-30-160 or other manufacturer's equivalent)

Misc.

Chassis box, IC socket, assorted audio jacks, cable, wire, hardware



PETANIMATION - FOR FUN AND FROLIC

Two ways to move a "ball" back and forth across the PET's screen:

First, the easy way:

```
10 FOR I=1TO39:PRINT"○●(L)";:NEXT
20 FOR I=1TO39:PRINT"○(L)●(L)";:NEXT
```

And then the "hard" way:

```
10 FOR I=33568 TO 33607:POKEI,81:POKEI,32
20 NEXT:FOR I=33607 TO 33568 STEP-1
30 POKEI,81:POKEI,32:NEXT
```

Try both methods of motion. I prefer not to use the POKEs because they create a lot of hash on the screen.

For those of you who really want to play, try this:

```
10 FOR I=1 TO 24:PRINT"○(L)(D)●(L)";
20 NEXT
30 FOR I=1 TO 24:PRINT"○(L)(U)●(L)";
40 NEXT
```

And, for the adventurous:

```
10 FOR I=1TO39:PRINT"○(L)(L)●(L)";:NEXT
20 FOR I=1TO24:PRINT"○(L)(D)●(L)";:NEXT
30 FOR I=1TO39:PRINT"○●(L)";:NEXT
40 FOR I=1TO24:PRINT"○(L)(U)●(L)";:NEXT
```

Have fun! If you discover any new game programs using these routines, let me know... - Terry

PET EDITING

Terry Laudereau

When you have typed a quotation mark and then try to backspace in order to correct an error, PET prints a on the screen instead of backspacing. There are two ways to avoid this:

- 1 - Hit Return, leave the line, and then go back up and correct the error. The problem with this is that now you can't program the movement of the cursor without inserting spaces and filling the spaces with the cursor character.
- 2 - Enter a second quotes mark. This takes you out of quotation mode, you can backspace to the error, correct it, and forward space to the quotation mark. You're still out of quotation mode, but you can get back in by typing the quote again. Eventually you'll have to delete the extra quotation marks, but that isn't as much trouble as having to leave the line and move the cursor around to get to the error.

The rule is that one quotes mark (an odd number of quotes) means you're in quote mode and all cursor controls can be programmed. Two quotes (an even number) indicates that you want the cursor to be moved, not programmed.

PET BASIC DOCUMENTATION

By Charles A. McCarthy

These snippets of the PET Basic interpreter have been annotated for a number of purposes:

1. I wanted to get some practice in 6502 machine coding, and this was the most convenient source of professionally done examples that I had. Deciphering the machine code and annotating it provides practice in abundance.
2. The transcendental functions appear to be not as accurate as they should be; I'm curious: WHY?
3. I'd like to know in some detail just how data is received and transmitted on the IEEE-488 bus and the User Port.
4. I'd like to have something - maybe a software patch - to keep the machine from bombing just before I finish typing in a long program. The information so far - that there's a non-interruptable bit of code somewhere - doesn't help much, and the apparent incompatibility of the 019 ROM with at least some PETs doesn't make me feel very good about trying one in mine.

While the arithmetic routines don't seem to be all that difficult to fathom once they're found, the annotation does take time, and I'd like to encourage others to provide similar documentation for other parts of the system. I myself plan to continue to decode and annotate the arithmetic subroutines through the transcendental functions.

I think my comments are accurate - I certainly hope so; but I would be more than pleased to be corrected on any point. Further, I'd appreciate knowing if greater detail would be desirable in future documentation. The experienced programmer will probably say that there is too much explanation, but I'm a no-

vice myself and I can't afford to put in less detail - because then I won't be able to understand it myself afterward.

My thanks go to all those who have provided clues as to what's really going on inside PET, particularly to SPHINX, those who in the various User Groups notes have described various applications and actions of assorted SYS and POKE commands, and to those who have privately provided me with documentation that they, but not I, have received from Commodore.

* * * * *

Representation of Floating Point Numbers in Memory:

A floating point number stored in memory consists of five consecutive bytes of data, denoted by E, M₁, M₂, M₃, and M₄.

E is the base 2 exponent centered at 128. $E=128 + q$ means that the number lies between 2^q and 2^{q+1} . $E=0$ is taken as sufficient for the number to be zero. The most significant bit of M₁ is the sign of the mantissa: 0 if the mantissa is positive, 1 if the mantissa is negative. The remaining bits of M₁ through M₄ are the least significant 31 bits of the true mantissa. The most significant bit of the mantissa is always taken as 1, is effected through ORA #80 with M₁. This destroys the sign information, however, which must be preserved elsewhere.

The following subroutines load a number from memory into the primary or the secondary accumulator. The hex numbers are the addresses of the subroutines. (ED. NOTE: The following subroutines are copied - not retyped - from Charles's letter.)

Subroutine: Load a number from memory into the secondary accumulator

D95E-D988

Assumptions: The number consists of the bytes
E, M₁, M₂, M₃, M₄ stored in memory locations

PPQQ through PPQQ + 4. The Y register contains
PP and the accumulator contains QQ

Upon return: QQ \in 71, PP \in 72

B8-BE contain E, 1, M₁, M₂, M₃, M₄, M₁, a sign flag.

The accumulator contains the exponent byte from
the primary accumulator

The X register has not been changed

The Y register contains 00

Code				
D95E	STA 71	STY 72	LDY#04	Sets up acquisition of number through indirect-Y instructions
D964	LDAIY 71	STA BC	DEY	M ₄ \in BC Y = 3
D969	LDAIY 71	STA BB	DEY	M ₃ \in BB Y = 2
D96E	LDAIY 71	STA BA	DEY	M ₂ \in BA Y = 1
D973	LDAIY 71	STA BD		M ₁ \in BD
D977	EOR B5	STA BE		sign flag \in BE (see note)
D97B	LDA BD	ORA#80	STA B9	M ₁ recovered from BD, most sig. bit inserted, 1, M ₁ \in B9
	DEY			Y = 0
D982	LDAIY 71	STA B8		E \in B8
D986	LDA B0			Exp from pri. acc. into acc.
D988	RTS			

Notes: 1, M₁ denotes the most significant stored bits
of the mantissa with the implied 1 inserted. The sign of the
mantissa remains available as the most significant bit of
location BD. Location BE is the exclusive or of the stored
mantissae of the two numbers in the primary and secondary
accumulators; thus the most significant bit of BE is 0 if
the two mantissae have the same sign, and is 1 if the two
mantissae have opposite signs.

REVIEW: PET-SHACK ROM LISTING
and PET SCHEMATICS

by Rick S. Simpson

These are both excellent products, and I strongly recommend that every PET owner purchase them. (What is really stupid is that PET-SHACK should have had to go through all the trouble of tracing out the PET schematic in the first place, or disassembling the ROM routines - any reputable manufacturer should provide this information as a matter of course, and should include it with every unit shipped, at no extra charge.)

The package of schematics is especially valuable for every PET owner because the day may come when you need to get your PET fixed and Commodore is unable or unwilling to help. A set of schematics is cheap insurance. The package is really complete. It contains parts layouts and complete schematics for the main logic board, cassette unit, and video board (I worked for Commodore, and I had never seen the cassette schematics!). The package also contains data sheets for all the hard-to-find ICs in the PET. The package we got also contained some guesses as to the differences between PETs using 2114 vs 6550 RAM chips and 6540 vs 2316 ROM chips. (I think the 2316 is pin-compatible with the Intel 2716 EROM, so you could make your own custom ROM set for your PET!)

The ROM listing package will only be of interest to PET owners who are interested in doing machine-language programming, but for those users, this material is invaluable. The listings contain decimal addresses, hex addresses, disassembled code, decimal value, hex value, and ASCII equivalent. Unfortunately, there is not a single comment in 14K of code (since this is just a disassembly), so a lot of hard work will be re-

quired before much of the code is useful (are you listening, Chuck Peddle?).

They do include the page zero assignments, as published in the PAPER, and their guesses at some subroutine entry points. Unfortunately, there is no indication where arguments for the subroutines are passed, etc. We at THE PAPER would love to publish commented subroutines as you puzzle them out.

My only gripe is that the ROM listing is printed on loose sheets, and no space is left on the margin for three-hole punching so they can be put in a binder.

Buy both packages, use them, and share your discoveries with other PET owners.

(ED. NOTE: The page zero assignments as published in the PAPER Vol 1 Issue #3 were reprinted from the SPHINX newsletter.)

* * * * *

T I S

WORKBOOKS FOR THE COMMODORE PET 2001

Getting Started with Your PET WB-1 \$4.00

Covers the fundamentals of PET BASIC: calculator and program mode, data input and output, data representation, program storage on the cassette.

PET String and Array Handling WB-2 \$3.95

Covers string and substring search, concatenation, replacement and manipulation.

PET Graphics WB-3 \$4.95

Covers use of cursor control and special graphics symbols to draw plots, histograms, and sketches.

PET Cassette I/O WB-4 \$4.95

Covers OPEN, CLOSE, string and numeric data files.

Miscellaneous PET Features WB-5 \$3.95

Covers the clock, random number generator, upper and lowercase alphabetic characters, saving memory space, etc.



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money order today to:

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Subroutine: Load a number from memory into the primary accumulator

DA74-DA98

Assumptions: The number consists of the bytes E, M_1, M_2, M_3, M_4 stored in memory locations

PPQQ through PPQQ+4. The Y register contains PP and the accumulator contains QQ

Upon return: QQ \in 71, PP \in 72, OO \in BF
BO-B5 contain $E, .1, M_1, M_2, M_3, M_4, M_1$

The accumulator contains E
The X register has not been changed
The Y register contains OO

Code					
DA74	STA 71	STY 72	LDY#04		Sets up acquisition of number through indirect-Y instructions
DA7A	LDAIY 71	STA B4	DEY	$M_4 \in B4$	Y = 3
DA7F	LDAIY 71	STA B3	DEY	$M_3 \in B3$	Y = 2
DA84	LDAIY 71	STA B2	DEY	$M_2 \in B2$	Y = 1
DA89	LDAIY 71	STA B5		$M_1 \in B5$	
	ORA#80	STA B1	DEY		most sig. bit of mantissa inserted, $.1, M_1 \in B1$. Y = 0
DA92	LDAIY 71	STA B0	STY BF	$E \in B0$	OO \in BF
DA98	RTS				

Notes: $.1, M_1$ denotes the most significant stored bits of the mantissa with the implied 1 inserted. The sign of the mantissa remains available as the most significant bit of location B5

(Please contact Charles directly if you have questions or comments - perhaps working together, we can figure out all the stuff Commodore doesn't seem to want us to know. His address is 1359 Idaho Avenue, St Paul, MN 55108. - Terry)

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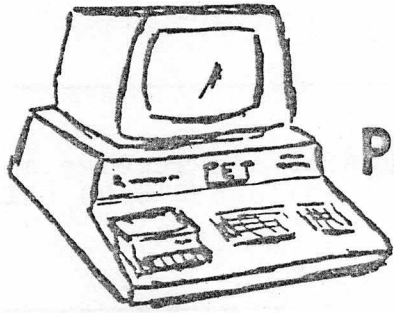
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