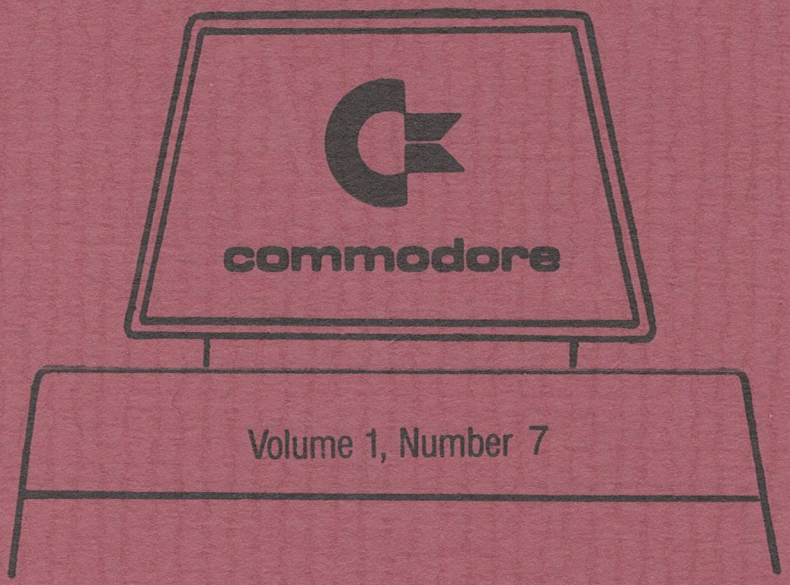
PET
USERS CLUB



Volume 1, Number 7

NEWSLETTER

COMMODORE BUSINESS MACHINES, INC.

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The Charter of the COMMODORE PET USER CLUB is to provide a method of sharing up-to-date information, and programs relating to the PET Computer between the many PET owners and Users. Membership charges in the United States and its possessions are $15.00 annually, while subscriptions outside the U.S. are $25.00 yearly.

We would like to publish features from PET Users concerning specific applications, interesting discoveries or even bits worthy of sharing. If you would like to contribute to future NEWSLETTERS, please send your article, letter or comments to: THE EDITOR, COMMODORE U.S. PET USERS CLUB, COMMODORE BUSINESS MACHINES, INC., 3330 SCOTT BLVD., SANTA CLARA, CALIF 95051.

Editor Notes

Dear PET User Club Readers:

Welcome to issue #7 of the Newsletter! In looking over our reader response it seems like most of you are interested in using your PETS for practical applications, particularly business. In answer to your requests, the majority of this issue is devoted to the practical aspects of your PET.

Be sure to look over the Data Exchange section for some commonly asked questions from Customer Service especially if you are interested in finding out some of the accessories we recommend for the 2022 PRINTER and FLOPPY DRIVE.

In Commodore News we are featuring a listing of the courses being offered by the Technical Training Program presented nationally by Lawrence Livermore Laboratory and the U.S. Dept. of Energy.

Our Software section includes a list of Business Application software in answer to your many requests, along with a sample of our new Client Accounting Program.

As a follow up to Volume #6, How to Write A Random Access File, we included in Programming, How To Implement a Sequential Data File.

For those of you who like to have fun with your PET, in Bits and Pieces we have included programs for "One Line Squiggle" and "Bullet Proof Input with Flashing Cursor".

Dedicated computer enthusiasts will enjoy an Upgraded Basic Memory Map in Programming.

Your responses to this newsletter are valued. In order for us to effectively answer any questions you may have regarding you PET or newsletter contents, write:

The Editor
COMMODORE BUSINESS MACHINES
3330 Scott Blvd.
Santa Clara, California 95050

THE EDITOR

Data Exchange

INSTRUCTING THE PRINTER TO PAGE

Q: HOW DO YOU INSTRUCT THE PRINTER TO PAGE?

A: PRINT#4,"[T]";
Should you want to end your page early and go to the top of the next page;
PRINT#4,"[3]";
If you wish to continue paging simply;
PRINT#4,"[3][0]";
instead of the above line.

ERROR WITH NEW DISKETTE

Q: I RECENTLY BOUGHT A NEW DISKETTE, WHENEVER I INITIALIZE I GET AN ERROR.

A: Has the diskette been properly formatted by using a "new" command?

THE TRAVELING PET

Q: CAN AN AMERICAN PET (110 60HZ CYCLES) BE USED ON 50 CYCLES?

A: NO, you must have a compatible transformer for European voltage and frequency.

2022 PRINTER RIBBON

Q: WHAT TYPE OF RIBBON IS NEEDED FOR THE 2022 PRINTER?

A: Commodores 905241-01 ribbon is recommended for use with the CBM Printer. It can be found at any Commodore Dealer.

FLOPPY DRIVE DISKETTE

Q: WHAT TYPE OF DISKETTE IS NEEDED FOR THE FLOPPY DRIVE?

A: Commodore recommends using a high quality, soft sectored diskette. Either 3M, Dysan, or Maxell Diskettes works very well with the Floppy Drive.

DISK ORGANIZATION

Q: WHAT IS THE ORGANIZATION OF THE DISKETTE? SECTOR,TRACK OR BLOCK?

A: Block is the same as Sector. There are 35 tracks on a disk. Track 18 is the directory. The number of sectors per track varies from 17 on the innermost track to 21 on the outermost track.

DISK DATA

Q: HOW IS DATA STORED IN THE DISKETTE? BINARY? ASCII ?

A: All data is stored as ASCII code on the diskette.

Commodore News

Technical Training Program

Commodore Business Machines, an international manufacturer and worldwide distributor of microcomputer systems, announces the availability of a new computer training course which offers to the public the opportunity to realize the ease of operation and wealth of applications for microcomputers. Taught by skilled professionsal instructors via video-tape, the course consists of 19 lectures and 5 hands-on laboratory sessions. The program entitled "Introduction to Industrial Microcomputer Systems", was developed by the Lawrence Livermore Laboratory of the University of California and supported by the U.S. Dept. of Energy.

Recognizing the fact that a shortage of skilled technical people could seriously hamper this nation's drive to become self-sufficient in energy and could also frustrate industry's continuing efforts to incorporate modern technology, Commodore Business Machines is pleased to utilize its worldwide distribution network in making this course available to all interested parties.

Initial training sessions for Commodore's 400-plus dealer network were held in New York, Chicago, Atlanta, Dallas, Houston, Los Angeles, San Francisco, Denver, Detroit, Washington D.C. and Miami during the months of June and July. Dealers will, in turn, offer the course to the public in over 100 cities throughout the nation.

"The following is a reprint from the Lawrence Information Brochure, Livermore Laboratory."

Training Packages Available For Loan

The Technology Training Program (TTP), presented by Lawrence Livermore Laboratory and sponsored by the U.S. Department of Energy, wishes to transfer its microcomputer technology and expertise to industry and others through its videotaped course series. Training packages of videotaped lectures and limited amounts of course material will be loaned at no charge to interested industries, organizations and educational institutions. Loans are subject to the availability of the packages.

Before borrowing the training package, each user will be sent an "Overview Summary" videotape detailing the course content. After viewing this tape, prospective borrowers can determine whether TTP's training package is appropriate for their particular training programs.

Introduction to Industrial Microcomputer Systems, the first course of the series, is now videotaped. This preliminary course is designed for technical persons who are beginners in the electronics and computer fields. However, engineers, technicians, designers, and college instructors of other technical fields could benefit from this course as could managers who only want an introduction to the industrial microcomputer field.

Costs

There is no charge for the loan of the training packages. However, borrowers must pay shipping and handling costs.

Future Courses

Courses to be videotaped in the near future include:

. Industrial Microcomputer Systems
This course covers the fundamentals of microcomputers as applied to industrial systems.

. Industrial Applications of Microcomputer Systems
This applications course focuses on the specific techniques of applying microcomputers to industrial processes.

The date when these tapes will be available for loan has not yet been determined.

Introduction To Industrial Microcomputer Systems

Each borrower receives the following in a training package.

24 videotapes (each is 50 minutes long):
19 lecture
5 laboratory (optional)
Course material (amount limited)

The five laboratory videotapes are optional since they are structured around the Commodore PET computer.

TTP strongly recommends that the user supplement videotaped lectures with a hands-on laboratory. Any commercially available microcomputer capable of being programmed in BASIC language can be used effectively with this course. TTP also encourages borrowers to duplicate videotapes and printed course material for their own continued use.

Lesson 1 — Introduction
Role of microcomputer systems in industry.

Lesson 2 — Technology Revolution
Growth of microcomputer technology; effects of the technology on industry.

Lesson 3 — Industrial Application Analogies
Memory; computer sequences; the microcomputer

Lesson 4 — Industrial Microprocessors: An Introduction
Historical control systems; time-shared computers; minicomputer systems; dedicated/hardware controllers; programmable logic controllers; computer controllers; memory technology.

Lesson 5 — Computer Concepts: Part I
General-Purpose Digital Computers; classes of computers; history of computers.

Lesson 6 — Computer Concepts: Part II
Central processing units; the program; instruction sequencing; types of instructions; flow charting; memory.

Lesson 7 — Industrial Programming
Relay logic; ladder diagrams; high-level languages; controller systems.

Lesson 8 — Computer Structure
Data storage systems; computer input/output; bus lines; software programming; translators; interpreters.

Lesson 9 — Introduction to Computer Programming
Writing a computer program; examples.

Lesson 10 Structured Programming: Part I

Buzz words; structure programming forms and advantages; other types of programming.

Lesson 11 Structured Programming: Part II

Examples of structured and nonstructured programming.

Lesson 12 Software Costs

How to estimate software costs and evaluate proposals.

Lesson 13 Number Systems

History of number systems; positional notation; general notation; binary, octal, and hexadecimal systems; number system efficiency and conversion.

Lesson 14 Computer Organization

Programming model; memory words; word format; 8-bit microprocessors; microprocessor register.

Lesson 15 Basic Digital Logic and Logic Elements: Part I

Digital logic; logic circuits; digital signals; digital device considerations; digital elements; gates and gating.

Lesson 16 Basic Digital Logic and Logic Elements: Part II

Multiplexers; decoders; buses; gates and gating; Large Scale Integrated Circuits; schematics.

Lesson 17 Transducers

Microprocessor transducers; direct digital transducers; binary transducers; application devices; modules; system problems.

Lesson 18 Input/Output Elements

Buffers; relays; digital rotation; examples of typical input/output elements.

Lesson 19 Future Trends in Industry

Future trends in: modular systems, single board computers, single chip computers.

FOR MORE INFORMATION REGARDING THESE PROGRAMS CONTACT:

TTP Registrar
P.O. BOX 808 L-699
Livermore, California 94550

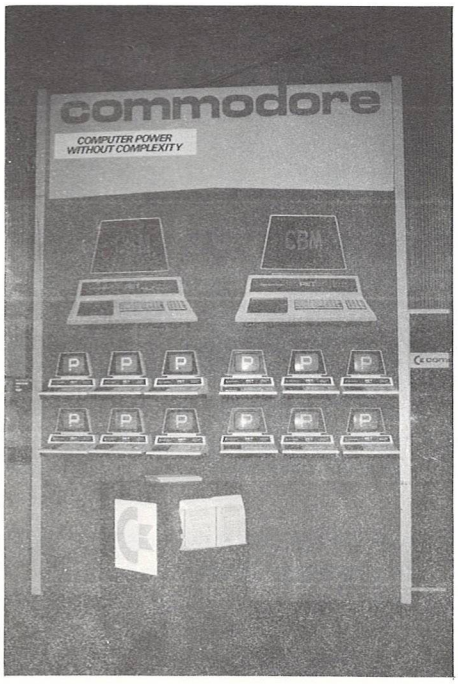
National Small Computer Show

The Third Annual National Small Computer Show proved to be another event in which the Commodore Exhibit was truly a focal point for those attending. Held at the New York Coliseum, August 23rd through 26th, thousands packed the main exhibit floor, despite the rising temperatures and mostly humid weather prevailing through the shows duration.

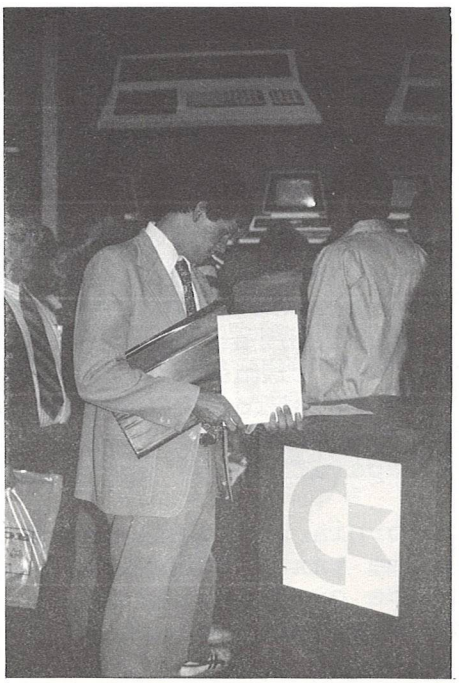
Commodores exhibit, directly forward of the main entrance, was highly visible to the crowds, with its 14 foot high "Pet Tower" featuring 12, 8K PET Computers. Executives representing diverse industries viewed and controlled the several complete CBM systems, while others watched formal presentations on the new business software.

The exhibit itself was divided into several modular sections announcing the new Word Processing, Client Accounting and educational programs.

Many thanks to Computer Factory, which shared the stage with Commodore, and to all those responsible for making the show a success.



Commodore's
14' PET Tower



The Show in
Progress

Software

CBM Management Information System (CBM-MIS)

The CBM Management Information System (CBM-MIS) is a system with computer muscle for the growing business who heretofore could not afford such a system.

BUSINESS APPLICATION SOFTWARE

We receive a lot of requests from readers on where they can order more Business Application Software. Following is a listing of Business Software available from BEC, along with a brief description of each program.

ACCOUNTS RECEIVABLE MANAGEMENT

The business user can immediately begin using the Accounts Receivable billing function to automatically prepare statements at the intervals selected by the business user. The Accounts Receivable function allows the user to age receivables and to include the aging in customer statements. Sales are automatically posted to the proper general ledger accounts as they are entered.

ACCOUNTS PAYABLE MANAGEMENT

The business user can immediately begin using the features of the Accounts Payable which allows the user to pay vendors selectively by invoice or to an outstanding balance. The business user can immediately prepare computer generated accounts payable checks and post the results to the general ledger check register automatically.

PAYROLL MANAGEMENT

The business user can immediately begin using the payroll functions that allow the user to specify special deductions as well as the standard FUI, SUI, FICA, SDI, etc. The user can begin immediately to print employee paychecks and have the payroll system tie the transactions to such general ledger accounts as payroll tax payable, FICA withholding, etc. The business user can print W-2 forms as required and use the payroll system to help in preparation of the Form 941.

California business users can immediately start using the state income tax withholding features (Business Enhancement Compuservice can provide state withholding features for other states on special request.)

GENERAL LEDGER/FINANCIAL MANAGEMENT

The business user can immediately begin keeping the user's general ledger for effective financial reporting of income and to produce balance sheets on demand. Those business users who intend to continue with existing accountants can do so and use the general ledger as a tool for preparing inputs to the outside accounts.

INVENTORY MANAGEMENT

The business user can immediately begin management of the user's business inventory. The user can set re-order levels, establish price lists, dock location for picking sequences, and maintain inventory valuation.

CUSTOMER INFORMATION MANAGEMENT

The business user can use the effective customer information software to produce mailing labels, select by category, sort by last name, company name or zip code. Salesmen can use the customer information software to set appointments, as a prospects list or as a direct mailing list.

JOB COST/BID MANAGEMENT

The business user can immediately use the Job Cost/Bid software to set standard prices for goods, services or overhead. These standards can then be used to prepare bid proposals. Once the proposal has been accepted, the Job Cost/Bid software can be used to track the actual cost against the bids.

SUMMARY:

The CBM-MIS programs consist of the following:

- o --- General Ledger/Financial Management
- o --- Accounts Receivable Management
- o --- Accounts Payable Management
- o --- Payroll Management
- o --- Inventory Management
- o --- Job Cost/Bid Management
- o --- Customer Information Management

The CBM-MIS programs are the property of Commercial Computers, Inc. of Minneapolis, Minnesota. Business Enhancement Compuservice of Escondido, CA. has added over one man-year of programming effort to the packages to make them ready for marketing on the Commodore computer systems. In addition, the software packages have been installed and running in actual businesses prior to this release. Commercial Computers, Inc. has given Business Enhancement Compuservice exclusive rights to market the programs.

PACKAGING/ORDERING INFORMATION

Each module comes on a separate 5-1/4" diskette. Test data is included on each diskette.

A complete users manual in a three-ring binder is supplied as a guide and training aid to the user.

Prices include shipping. Terms are COD. The prices are as follows:

	Retail
CBM-MIS Complete 7-Module Set	$795
Each Module purchased separately	$120

One three-ring binder is included with each 7-Module Set at no additional charge. Orders for individual modules include the general documents for the program set and the specific documents for the module orders. All single module orders are packaged in a ziplock plastic bag. The module diskette is included in the bag encased in strong protective holder.

Send orders to:

Business Enhancement Compuservice
1711 E. Valley Parkway, Suite 109
Escondido, California 92027
714-741-6335

or check with your local CBM dealer for availability

*Prices quoted in this release subject to change without notice.

Client Accounting

Client Accounting is a new series of programs designed to be used with the 32K PET, Printer and disk now offered by Commodore. Developed by an accountant to handle the needs of a multi-client accounting practice the program is still simple enough for smaller business use. This program is designed for the easy implementation of new features. Following are samples of the trial balance sheet, income expenses and net loss statement and balance sheet.

CBM SOFTWARE

TRIAL BALANCE

AUGUST, 1979

CODE	ACCOUNT TITLE	AMOUNT DEBIT	AMOUNT CREDIT
101	CASH IN LITTLE CITY BANK	192,015.00	
108	PETTY CASH	5,000.00	
211	ACCOUNTS PAYABLE - TRADE		(1,000.00)
281	LONG - TERM NOTES PAYABLE - BANK		(100,000.00)
293	RETAINED EARNINGS (DEFICIT)		(100,000.00)
506	RENT	350.00	
514	ADVERTISING	50.00	
515	BUSINESS LICENSES AND TAXES	1,000.00	
517	BUSINESS INSURANCE	500.00	
520	GROUP INSURANCE	2,000.00	
524	UTILITIES	10.00	
525	TELEPHONE	25.00	
529	STATIONERY AND SUPPLIES	50.00	
	TOTALS	$ 201,000.00	$ (201,000.00)

(Prepared from the accounts without audit)

CBM SOFTWARE

STATEMENT OF INCOME, EXPENSE AND NET LOSS

FOR THE TWO MONTHS ENDED AUGUST 31, 1979

Sales	$	-0-
Cost of Sales		-0-
Gross Profit		-0-
Operating Expenses		3,985.00
Operating Loss		(3,985.00)
Provision for Income Taxes		-0-
Net Loss	$	(3,985.00)

(Prepared from the accounts without audit)

(Prepared from the accounts without audit)

CBM SOFTWARE

BALANCE SHEET

AUGUST 31, 1979

ASSETS

CURRENT ASSETS:		
Cash	$	197,015.00
Total Current Assets		197,015.00
TOTAL ASSETS	$	197,015.00

LIABILITIES AND EQUITY

CURRENT LIABILITIES:		
Notes Payable	$	-0-
Accounts Payable		1,000.00
Total Current Liabilities		1,000.00
LONG TERM DEBT		100,000.00
SHAREHOLDERS' EQUITY:		
Paid-In Capital		100,000.00
Retained Deficit		(3,985.00)
Total Equity		96,015.00
TOTAL LIABILITIES AND EQUITY	$	197,015.00

(Prepared from the accounts without audit)

* The Client Accounting Package, priced at $349.95, will be at your local Commodore Dealer during the month of October.

Application

Getting More From Your Pet

The following letter is from Robert Osorio Jr. of Miami, Florida:

Dear Editor,

I am a PET owner and through a friend have sampled an issue of your newsletter (issue 3). I found it extremely informative, particularly the last article, "Probing Pet's Memory". I have discovered a memory location that you did not mention in your article. Decimal location 135 is where the PET stores the address of the last byte of RAM, during the diagnostic scan immediately after power-up. This value is stored as an indicator of 256 byte blocks. For instance, if your PET is a 16K machine, the value in location 135 will be 64 (64 x 256 = 16384 = 16k). As an example, my inventory program stores all data as five byte codes in the last 2k of RAM. The main problem is that the program itself once initialized consumes about 13K, and since Basic stores all variables and arrays at the end of memory, and Basic doesn't know that I'm poking my data there, there's normally nothing to keep my data and Basic's variables from mixing together and interfering with each other. In order to avoid this problem, the first line of my program pokes a 56 into location 135. Now, the pet has already set it's pointers to memory for variables and arrays when the program began so the program began so the program stops itself and restarts itself, reinitializing all pointers, and the Pet is tricked into thinking there is only 14K of RAM available (56 x 256 = 14336 = 14K). At this poing on, the PET would ignore the last 2K of RAM. Basic cannot touch it unless it is poked or peeked. This would also be useful for storing long machine language programs, safe where Basic can't touch it.

Programming

Sequential Data File

In our last newsletter we gave an example on HOW TO WRITE A RANDOM ACCESS FILE. This month we are giving an example of HOW TO IMPLEMENT A SEQUENTIAL DATA FILE.

```
SEQUENTIAL 1.00
 1 REM ************************
 2 REM *       EXAMPLE          *
 3 REM *  READ AND WRITE A      *
 4 REM *  SEQUENTIAL DATA       *
 5 REM *  FILE USING DRIVE 0    *
 9 REM ************************
 10 PRINT"■INITIALIZE DISK"
 20 DIMA$(25):REM                          SET A$ ARRAY
 30 DIMB(25):REM                           SET B ARRAY
 40 OPEN15,8,15:REM                        OPEN THE COMMAND CHANNEL
 50 PRINT#15,"I0":REM                      INITIALIZE DRIVE ZERO
 60 GOSUB 1000:REM                         READ THE ERROR CHANNEL
 70 CR$=CHR$(13):REM                       SET STRING CR$ TO A CARRIAGE RETURN
 90 PRINT"■WRITE TEST FILE"
 100 REM ************************
 101 REM *                      *
 102 REM *   WRITE TEST FILE    *
 103 REM *                      *
 105 REM ************************
 110 OPEN2,8,2,"@0: TEST FILE ,S,W" REM OPEN LOGICAL FILE 2 ON DISK 8 TO
 111 REM                                   CHALLEL 2 REPLACE DATA FILE NAMED
 112 REM                                   TEST FILE WITH SEQUENTIAL WRITE
 115 GOSUB 1000:REM                        READ THE ERROR CHANNEL
 120 INPUT"A$,B";A$,B:REM                  INPUT NAME, NUMBER INTO A$ AND B
 130 IFA$="END"THEN 160:REM                STOP THE DATA INPUT
 140 PRINT#2,A$","STR$(B)CR$;:REM          PRINT TO THE DISK
 145 GOSUB 1000:REM                        READ THE ERROR CHANNEL
 150 GOTO 120
 160 CLOSE 2:REM                           CLOSE TEST FILE
 200 REM ************************
 201 REM *                      *
 202 REM *   READ TEST FILE     *
 203 REM *                      *
 205 REM ************************
 206 PRINT"■READ TEST FILE"
 210 OPEN2,8,2,"0: TEST FILE ,S,R":REM  OPEN LOGICAL FILE 2 ON DISK 8 TO
 211 REM                                   CHANNEL 2 NAMED TEST FILE WITH
 212 REM                                   SEQUENTIAL READ
 215 GOSUB 1000:REM                        READ THE ERROR CHANNEL
 220 INPUT#2,A$(I),B(I):REM                READ STRING INTO STRING ARRAY A$
 221 REM                                   AND NUMBER INTO ARRAY B
 224 RS=ST:REM                             STORE THE DISK STATUS
 225 GOSUB 1000:REM                        READ THE ERROR CHANNEL
 230 PRINTA$(I),B(I):REM                   PRINT WHAT WAS READ
```

```
 240 IFR S=64 THEN 300:REM              CHECK FOR END OF FILE STATUS
 250 IF RS<>0 THEN 400:REM              CHECK FOR ERROR IN FILE STATUS
 260 I=I+1:REM                          ADD 1 TO ARRAY POINTER
 270 GOTO 220
 300 CLOSE 2:REM                        CLOSE TEST FILE
 310 END:REM                            END THE PROGRAM EXECUTION
 400 PRINT"■BAD■DISK■STATUS■IS■"RS
 410 CLOSE 2:REM                        CLOSE TEST FILE
 420 END:REM                            END THE PROGRAM EXECUTION
 1000 REM ************************
 1001 REM *   READ THE ERROR     *
 1002 REM *       CHANNEL        *
 1005 REM ************************
 1010 INPUT#15,EN$,EM$,ET$,ES$:REM      READ ERROR
 1011 REM                               EN$ IS THE ERROR NUMBER
 1012 REM                               EM$ IS THE ERROR MESSAGE
 1013 REM                               ES$ IS THE ERROR SECTOR
 1020 IF EN$="00" THEN RETURN:REM       RETURN TO MAIN LOGIC IF NO ERRORS
 1030 PRINT"■ERROR ON DISK":REM         PRINT THE ERROR
 1040 PRINTEM$,EN$,ET$ES$:REM           PRINT THE ERROR
 1050 CLOSE 2:REM                       CLOSE TEST FILE
 1060 END:REM                           END THE PROGRAM EXECUTION
READY.
```

Paging on the Printer

Here is a good example of how the PAGER works on the CBM Printer. The smallest number of lines you can have per page is 10. Try playing with Lines 20 and 55.

```
READY.

 10 OPEN1,4,3
 20 PRINT#1,10
 40 OPEN2,4
 50 PRINT#2,"■";
 55 FORX=1TO20
 56 PRINT#2,"■";
 60 PRINT#2,X
 70 NEXT
READY.
```

```
■ 1
■ 2
■ 3
■ 4
■ 5
■ 6
■ 7
■ 8
■ 9
■ 10
```

```
■ 11
■ 12
■ 13
■ 14
■ 15
■ 16
■ 17
■ 18
■ 19
■ 20
```

SOME PET ROUTINES

By Jim Butterfield
and Jim Russell, Toronto

New		Old	
C2AA		C2AC-C2D9	peeks at the stack for an active FOR loop
C2D8		C2DA-C31C	"opens up' a space in Basic for insertion of a new line
C31B		C31D-C329	tests for stack-too-deep and aborts if found
C328		C32A-C356	check available memory space
C355		C357-C388	sends a canned error message from C190 area, then drops into:
		C389-C391	Signals 'ready'
C392	*	C394-C3A9	gets a line of input, analyzes it, executes it
C3AB	*	C3AC-C42E	handles a new line of Basic from keyboard; deletes old line, etc.
C439	*	C430-C460	corrects the chaining between Basic lines after insert/delete
C46F		C462-C476	receives a line from the keyboard into the Basic buffer
C481		C479-C48C	gets each character from keyboard
C495		C48D-C521	looks up the keywords in an input line and changes to "tokens"
C52C		C522-C550	searches for the location of a Basic line from number in 8,9
C55B		C551-C599	implements NEW command - clears everything
C5A7		C59A-C5A7	sets the Basic pointer to start-of-program
C5B5		C5A8-C647	performs LIST compand
C658		C649-C68F	executes a FOR statement
C6A1		C692-C6B4	continues to build FOR vectors
C6C4		C6B5-C6EF	reads and executes the next Basic statement, finds next line, etc.
C700	*	C6F2-C70A	executes the Basic Command as a subroutine
C730		C70D-C71B	performs RESTORE
C73F		C71C-C742	handles STOP, END, and BREAK procedures
C76B		C745-C75E	performs CONT
		C75F-C76D	set pause after carriage return (never called)
C577		C770-C772	performs CLR
C785		C775-C77D	performs RUN
C790		C780-C79A	performs GOSUB
C7AD		C79D-C7C9	performs GOTO
C7DA		C7CA-C7FD	performs RETURN
C80E		C7FE-C81E	scans for start of next Basic line
C830		C820-C840	performs IF
C853		C843-C862	performs ON
C873		C863-C89A	gets a fixed-point number from Basic and stores in 8,9
C8AD		C89D-C91B	performs LET
C928		C91C-C97E	checks numeric digit/move string pointer
C98B		C97F-C982	performs PRINT#
C991		C985-C996	performs CMD
C9A5		C999-CA24	performs PRINT
CA1C		CA27-CA41	prints string from address in Y,A
CA45	*	CA44-CA76	prints a character
CA4F		CA77-CA9E	handles bad input data
CA7D		CA9F-CAC5	performs GET
CAA7		CAC6-CADF	performs INPUT#
CAC1		CAE0-CB14	performs INPUT
CAFA		CB17-CB21	prompts and receives the input
CB07		CB24-CC11	performs READ
CBFC		CC12-CC35	canned messages: EXTRA IGNORED; REDO FROM START
CC20		CC36-CC8F	performs NEXT

New		Old	
CC79		CC92-CCB5	checks Basic format, data type, flags TYPE MISMATCH
CC9F		CCB8-CD38	inputs and evaluates any expression (numeric or string)
CD21		CD3A-CD9C	pushes a partially-evaluated argument to the stack
CD84		CD9D-CDB9	evaluates a numeric, variable, or pi, or identifies other symbol
CDA3		CDBC-CDCO	value of pi in floating binary
CDA8		CDC1-CDE7	checks for special characters (+, -, ", .) at start of expression
CDCF		CDE8-CDF6	performs NOT function
CDDE		CDF7-CE04	checks for various functions
CDEC		CE05	evaluates expression within parentheses ()
CDF2		CE0B	checks for right parenthesis)
CDF5		CE0E	checks for left parenthesis (
CDF8		CE11-CE1B	checks for comma
CE03		CE1C-CE20	prints SYNTAX ERROR and exits
CE08		CE21-CE27	sets up function for future evaluation
CE0F		CE28-CE39	set up a variable name search
CE2A		CE3B-CE96	checks for special variables TI, TI$, and ST
CE89		CE97-CED5	identifies and sets up function references
CEC8		CED60CF05	perform the OR and AND functions
CEF8		CF06-CF6D	performs comparisons
CF60		CF6E-CF7A	sets up DIM execution
CF6D		CF7B-D00E	searches for a Basic variable
D001		D00F-D078	creates a new Basic variable
D069		D079-D087	logs Basic variable location
D078		D088-D098	is array pointer subroutine
D089		D099-D09C	is 32768 in floating binary
D08D		D09D-D0B8	is floating point-to-fixed conversion for signed values
D0AC		D0B9-D263	locates and/or creates arrays
D259		D264-D277	performs FRE function
D26D		D278-D284	converts fixed point-to-floating
D27A		D285-D28A	performs POS function
D280		D28B-D294	checks direct/indirect command, gives 'ILLEGAL DIRECT'
D28D		D295-D348	executes DEF statements and evaluation FNx
D33F		D349-D36A	performs STR$ function
D361		D36B-D3D1	scans and sets up string elements
D3CE		D3D2-D403	builds string vectors
D400		D404-D5C3	does 'garbage collection' - discards unwanted strings
D5C6		D5C4-D5D7	performs CHR$ function
D5DA	*	D5D8-D653	performs LEFT$, RIGHT$, MID$ functions
D656		D654-D662	performs LEN, gets string length
D665		D663-D672	performs ASC function
D675		D673-D684	gets a single-byte value from Basic
D687		D685-D6C3	evaluates VAL function
D6C6		D6C4-D6CF	gets two arguments (16-bit and 8-bit) from Basic
D6D2		D6D0-D6E5	checks argument is in range 0-65535
D6E8		D6E6-D701	performs PEEK and POKE
D710		D702-D71D	executes WAIT statement
D72C		D71E-D890	performs addition and subtraction
D8C8		D891-D8BE	contains floating-point constants
D8F6		D8BF-D8FC	performs LOG function
D934		D8FD-D95D	performs multiplication
D998		D95E-D988	loads secondary accumulator from memory ($B8 to $BD)
D9C3		D989-D9B3	test and adjust primary/secondary accumulators
D9EE		D9B4-D9E0	routines to multiply or divide by 10
DA1B		D9E1-DA73	performs division
DAAE		DA74-DA98	loads primary accumulator from memory ($B0-$B5)

New		Old	
DAD3		DA99-DACD	transfers primary accumulator to memory
DB08		DACE-DADD	transfers secondary accumulator to primary
DB18		DADE-DAEC	transfers primary accumulator to secondary
DB27		DAED-DAFC	rounds the primary accumulator
DB37		DAFD-DB29	extracts primary sign; performs SGN function
DB64		DB2A-DB2C	performs ABS
DB67		DB2D-DB6C	compares primary accumulator to memory
DBA7		DB6D-DB9D	convert floating point to fixed, unsigned
DBD8		DB9E-DBC4	perform INT function
DBFF		DBC5-DC4F	convert ASCII string to floating point
DC8A		DC50-DC84	get new ASCII digit
DCCE		DC94-DCAE	print Basic line number
DCE9		DCAF-DDE2	convert floating point to ASCII string (at 0100 up)
DE1D		DDE3-DE23	conversion constants - decimal or clock
DE5E		DE24-DE2D	evaluation SQR function
DE68		DE2E-DE66	evaluation of power function
DEA1		DE67-DE71	negate (monadic -)
DEDA		DEA0-DEF2	perform EXP function
DF2D		DEF3-DF3C	perform function series evaluation
DF7F	*	DF45-DF9D	perform RND calculation
DFD8		DF9E	evaluate COS function
DFDF		DFA5-DEED	evaluate SIN function
E028		DFEE-E019	evaluate TAN function
E08C		E048-E077	evaluate ATN function
E0F9		E0B5-E0CC	Basic scan program, transferred to 00C2-00D9/0070-0087
E116		E0D2-E173	completion of power-on-reset; memory test, etc.
		E19B-E1BB	partial test for TI and TI$
		E1BC-E1E0	input/read/get director
E1DE	*	E1E1-E27C	initializes I/O registers, clear screen, reset subroutine
E285		E27D-E3C3	receive input from keyboard/screen
E3B4		E3C4-E3E9	set up new screen line
E3D8		E3EA-E52F	output character to screen
E519		E530-E5DA	check for and perform screen scrolling
E257		E5DB-E66A	start new screen line
E61B		E66B-E67D	interrupt entry
E6E4		E67E-E683	interrupt return
E62E		E685-E73E	hardware interrupt routine: cursor flash, tape motor, keyboard
E6F8		E73F-E7AB	convert keyboard matrix to ASCII
E6EA		E7AC-E7B9	write-on-screen subroutine
F156		E7DB-E7EB	print canned monitor message
F0B6		F0B6-F1CB	IEEE-488 channel open, test, close
F1D1		F1CC-F22F	get input character from keyboard, screen, cassette, IEEE
F232		F230-F27C	output character to screen, cassette, IEEE
F272		F27D-F2A3	restore normal I/O, clear IEEE channels
F26E		F2A4-F2AA	abort (not close!) all files
F28D		F2AB-F2B7	locate logical file table entry
F299		F2B8-F2C7	transfer file table entries to Device, Command
F2A9		F2C8-F329	perform file CLOSE
F301		F32A-F33E	test stop key
		F33F-F345	test if direct/indirect command for suppressing file advice
F3C2		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

New	Old	
F4B7	F4BB-F4D3	perform VERIFY
	F4D4-F529	get parameters for OPEN and CLOSE
F521	F52A-F5AD	perform OPEN
F5A6	F5AE-F5E2	search for any tape header
	F5E3-F5EC	clear tape buffer
F5DA	F5ED-F64C	write tape header
F63C	F64D-F666	get start & end addresses from tape header
DF7F	DF45	New for RND(0)
E054	E01A	floating constants
E0BC	E078	floating constants
E116	E0D2	new initial SP value
E116	E0D2	minor differences in initialization
E1B7	E174	Bytes free, Commodore Basic
	E19B	Save line #, Print "READY" (see C751 K72B)
	E19F	Part of TI (see CE2A/CE33)
	E1AB	Part of TI (see CE2A/CE33)
	E1BC	Part of INPUT, GET, READ, etc. (see CB07/CB24)
	E1D9	Part of INPUT, GET, READ, etc. (see CB07/CB24)
	E1C2	?
	E1CC	?
E1DE	E1E1	initialization, (minor differences)
E246	E236	clear screen
E229	E250	initialize line ptrs for clear screen (minor changes)
E257	E5DB	adjust line ptrs for preset line
E285	E27D	get clear from KB buffer
E29D	E297	Wait for KB input, write to screen, exit on CR
E2F4	E2FA	INPUT from screen
E5BA	E605	
	E73F	
E6F8	E75C	
	E7AC	
E748	E7BC	
E761	E7D5	
	E7DE	
E76A		WROA
E775		WROB
E784		WRTWO
E78D		ASCII
E797		T2T2
E7A7		RDOA } Monitor
E7B6		RDOB
E7E0		HEXIT
E7EB		RDOC
E7F7		ERROPR
F656	F667-F67C	Set buffer start address
F66C	F67D-F694	set tape buffer start and end pointers
F684	F695-F69D	perform SYS command
F69E	F69E-F71B	perform SAVE
	F71C-F735	find unused secondary address
F729	F736-F78A	update clock
F770	F78B-F7DB	set input device
F7BC	F7DC-F82C	set output device
F806	F82D-F83A	bump tape buffer counter
F812	F83B-F85D	wait for cassette PLAY switch
F835	F85E-F870	test cassette switch line

New	Old	
F847	F871-F87E	wait for cassette RECORD and PLAY switches
F855	F87F-F8B8	read tape initiation routine
F886	F8B9-F8D1	write tape initiation routine
F89E	F8D2-F912	complete tape read or write
F8E6	F913-F91D	wait for I/O completion
F8F0	F91E-F92D	test stop key and abort if necessary
F900	F92E-F95E	subroutine to set tape read timing
F931	F95F-FBFB	interrupt routine for tape read
	FBDC-FBE4	save memory pointer
	FBE5-FBEB	set ST error flag
	FBEC-FBFF	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	check sum routine
	FD90-FD9A	pointer advance subroutine
	FD9B-FFB1	diagnostic routines
		JUMP TABLE:
	FFC0	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-EFFA	turn off cassette motors
	FFFA-FFFB	NMI vector (mangled)
	FFFC-FFFD	reset vector
	FFFE-FFFF	interrupt vector

* = coding change

ONE LINE SQUIGGLE

```
 1000 PRINT"■■■■■■■■■■■ ONE LINE SQUIGGLE PROGRAM "
 1010 C$=CHR$(34)
 1020 PRINT"■■■ TYPE ■  (RETURN) FOUR TIMES
 1030 PRINT"■■■NEW
 1040 A=548:IFPEEK(49152)<>0THENA=167
 1100 PRINT"■■1P┌"RIGHT$(STR$(A),3)",0:X=4*R/(1)+1:F┌I=1TO10*R/(1):?M↖(";
 1120 PRINTC$"■┌■■"C$",X,1)"C$"●■"C$";:P┌"RIGHT$(STR$(A+1),3)",1";
 1140 PRINT":N¯:G┌1"
 1200 PRINT"LIST1
 1220 PRINT"■■■■■RUN
 1300 PRINT"IIIIIIIIIIIIII";
READY.
```

THE PROGRAM ABOVE GENERATES THE ONE LINE PROGRAM BELOW FOR YOUR TYPE PET.

16K/32K PETS

```
 1 POKE167,0:X=4*RND(1)+1:FORI=1TO10*RND(1):PRINTMID$("■┌■■",X,1)"●■";:POKE168,1
:NEXT:GOTO1
READY.
```

8K PETS

```
 1 POKE548,0:X=4*RND(1)+1:FORI=1TO10*RND(1):PRINTMID$("■┌■■",X,1)"●■";:POKE549,1
:NEXT:GOTO1
READY.
```

In the Break-Even Analysis articles in previous Newsletters, we explained how to simulate the cursor with a flashing underline. This next routine works on the same principal, but allows you to create a "Blinking Cursor" (flashing square).

BULLET-PROOF INPUT WITH FLASHING CURSOR

```
1Ø  POKE 167, Ø
2Ø  GETA$:  IF A$ = '''' THEN 2Ø
3Ø  IF  ( ASC (A$) AND 127 )  32 THEN PRINT
    CHR$  ( PEEK (169)  "  " ; CURSOR BACK
4Ø  PRINT A$;  :  IF A$  CHR $  (13)
5Ø  POKE 167, 1
```

Location 167 controls the blinking of the cursor by the interrupt driven keyboard. If a zero is deposited in this location as in line 1Ø the cursor will begin blinking with the next interrupt cycle. Location 169 stores the original character at a screen location before the blinking begins. If the cursor is moved (as determined by line 3Ø) the character must be retreived and printed before the cursor movement causing character is printed.

	NEW	OLD
Hex	$47	$224
Hex	$49	$226
	167	548
DEC	169	550

Peripherals & Attachments

Communication with the 2040 Disk

This will be interesting for those of you who are planning to use other peripherals or designing interfaces. The following is a diagram of the commands as they are sent over the IEEE bus to LOAD and SAVE a program on the 2040.

SAVE	ATN	EOI	LOAD
	false		
28 listen addr 8	true	false	28 listen addr
F1 secondary addr 1	true	false	FØ secondary addr 1
	false		
f			f
i			i
l			l
e			e
n			n
a			a
m			m
e			e
listen byte	false	true	last byte
3F unlisten	true	false	3F unlisten
28 listen addr 8	true	false	48 talk addr 8
61 secondary addr 1	true	false	6Ø secondary addr Ø
load addr lo	false	false	load address lo
load addr hi	false	false	load address hi
b			b
y			y
t			t
e			e
s			s
last byte	false	true	last byte
3F unlisten	true	false	5F untalk
28 listen addr 8	true	false	28 listen addr 8
E1 secondary addr 1	true	false	EØ secondary Ø
3F unlisten	true	false	3F unlisten

Users' Directory & Announcements

One of the major advantages in being a member of the PET USER'S CLUB is the ability to get hold of PET related Software and ideas. Although our Master Library of programs is now growing, we get frequent Software inquiries for a wide range of applications.

If you would like to use your PET for fun and profit, why not offer personal tutoring in PET programming to new PET owners. Alternatively, if you require a program to be written for you, ask for contacts via the USER'S DIRECTORY. The possibilities are endless. Please write to the EDITOR, U.S. PET USER"S CLUB, at our current address below.

To include your name in the USER'S DIRECTORY, please complete the following form:

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To include as many contacts as possible, we must restrict each USER to only one line of description.

COMMODORE reserves the right to edit or withdraw entry.

CORRECTIONS FOR # 6 NEWSLETTER

Pg. 2 DATA EXCHANGE:

The alpha-numeric printout should have been preceeded by the following heading: CBM 2022 & 2023 PRINTER CHARACTER SET and not with the numerals and graphics as displayed in the newsletter.

Pg. 8 GRAPHIC SYMBOL REFERENCE TABLE:

"Keyboard Entry" should have read: "Shifted Keyboard Entry."

Pg. 17 SOFTWARE CONTEST WINNER:

Congratulations again Cliff Costa for your prize winning Automatic Mileage Program. Our apologies for the name error at the end of the section.

Pg. 23 PET DOS SUPPORT PROGRAM:

At the end of the bottom paragraph the sentence that reads: "After entry save both routines from the monitor (SA=$08B8)". The sentence should have read: "After entry save both routines from the monitor (SA=$0400, EA=$08F8)."

Pg. 26 LINE 5 READ, "5SYS2222".

Should have read, "5 SYS2221"

Pg. 39 LINE 820 READ:

E=0: IFT=OTHEN=40:GOTO1900:
It should have read: E=0:IFT=OTHENEN=40:GOTO1900

Pg. 43 ASCII LIST PROGRAM:

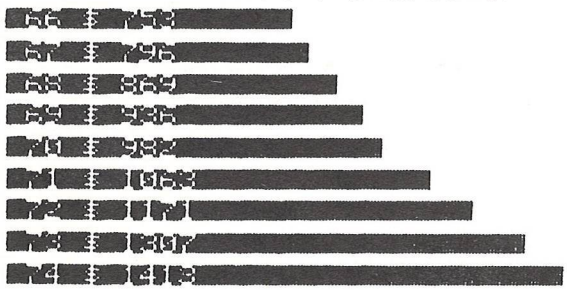
The listing references were reversed. The second paragraph should have read: "The first listing is the normal program (as printed on a PET Printer). The second listing is the converted program (the actual convert program starts at line 5000, the rest is a demonstration)."

CORRECTION TO 8K USER MANUAL Pg. 52

GROSS NATIONAL PRODUCT

We found that the program for the Gross National Product was incorrect because the program was typeset, not listed. Here is the actual program with the characters as they appear on your screen.

```
          GROSS NATIONAL PRODUCT
             (IN $ BILLIONS)
```



```
 5 OPEN4,4:CMD4:FORI=1TO4:PRINT:NEXT
 10 SP$="":FORI=1TO40:SP$=SP$+" ":NEXT
 20 A$(1)="■"+"▌ ":A$(2)="■"+"▌ ":A$(3)="■"+"▌ ":A$(4)="■"+"▌ ":A$(5)=" ▌"
 21 A$(6)=" ▌":A$(7)=" ▌"
 30 FORI=0TO8:READV(I):NEXT
 40 PRINT"□"SPC(8)"GROSS NATIONAL PRODUCT"
 50 PRINTSPC(12)"(IN $ BILLIONS)■"
 100 FORI=0TO8
 110 X=V(I)/50:Y=INT(X)
 120 PRINT"■"STR$(66+I)" $"STR$(V(I));
 130 PRINT"■"LEFT$(SP$,Y-9)A$(8*(X-Y))"■"
 140 NEXT:FORI=1TO4:PRINT:NEXT:LIST
 200 DATA753,796,869,936,982,1063,1171,1307,1413
READY.
```

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