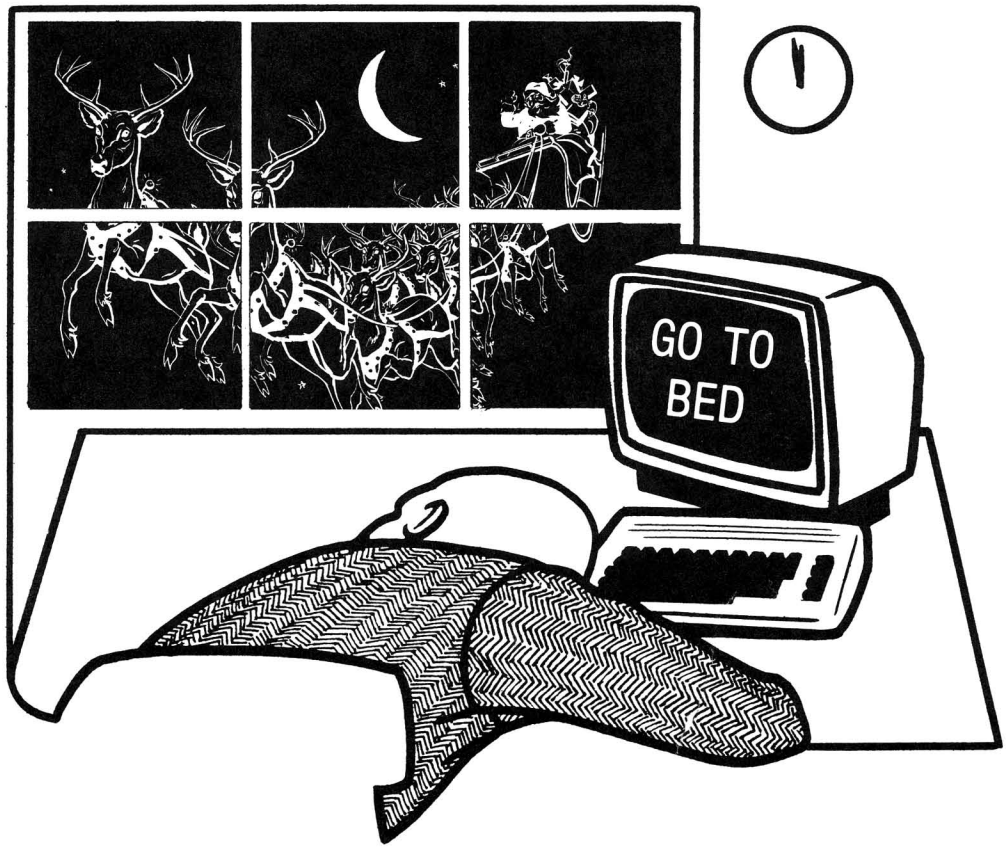
The MIDNITE SOFTWARE GAZETTE

The PAPER

ISSUE 10 DECEMBER, 1982/JANUARY, 1983 VOLUME IV, ISSUE 6



The Independent U.S. magazine for users of Commodore brand computers.

Published by Midnite Software, Inc.

$3.50 US

WELCOME

Welcome to issue ten of the Midnite Software Gazette, and volume 4, issue 6 of The Paper. Special thanks to all our new subscribers. Immediate circulation this issue will be close to 1,000. Issue 9 has already been reprinted once, due to heavy requests for sample issues.

Attention: The PAPER subscribers! You must re-subscribe NOW (if you haven't already), to receive any more issues! In North America, send $20 US or $25 CDN. Overseas, send $30 US for surface mail, or $40 US for airmail.

****

Several names are abbreviated in this issue: Marilyn Achelpohl (MA), Brent Anderson (BA), Ralph Bressler (RB), Arthur Cochrane (AC), Fran Donovan (FD), Jerry Key (JK), Wayne Krauder (WK), Mark Niggemann (MN), John O'Hare (JOH), Jim Oldfield (JO), Jim (JS) and Ellen (ES) Strasma, Larry Woolard (LW), and Wayne Zirkle (WZ). Thanks to all whose names appear beside their columns, comments and reviews.

****

Send subscriptions, advertisements, hints & reviews to Jim Oldfield at:

The Midnite/PAPER
635 Maple
Mt. Zion, IL 62549 USA
Telephone: 217/864-5320

Send articles to Ralph Bressler at:

Centerbrook Software Designs
P.O. Box 460
Livingston Manor, NY 12758 USA
Telephone: 914/439-3591

The editors, Jim and Ellen Strasma, may be reached at:

Midnite Software, Inc.
1280 Richland Av.
Lincoln, IL 62656 USA
Telephone: 217/735-2703

Send requests for public domain programs to Brent Anderson at:

ASM/TED User Group (ATUG)
200 S. Century St.
Rantoul, IL 61866 USA
Telephone: 217/893-4577

Other columnists may be reached at the following addresses:

CBM/PET Notes: to Jerry Key, 151 Flint Ridge Dr., Gahanna OH 43230
CBM64 Notes: to Ken Penny, c/o The Midnite/PAPER.
Church Notes: to John Easton, 252 Lake Promenade, Toronto ONT CANADA
Ham Notes: to Clark L. Stewart, 104 Henrietta St., Ravenswood WV 26164
Modem Notes: to Tim Tremmel, 3614 Sovereign Drive, Racine WI 53406
VIC and Game Notes: to John O'Hare, 41 - 132nd St., Lemont IL 60439

****

* The Midnite/PAPER is published bi-monthly by Midnite Software, Inc.
* Subscriptions cost $20 (US) via first class mail in the U.S., $25 (CDN) in Canada, $30 by surface mail overseas, and $40 via air mail overseas.
* Pre-paid camera-ready advertisements cost $100 per page.
* Orders of 6 or more copies to one address are welcome, for $15.
* The Midnite/PAPER welcomes articles, hints, and reviews.

****

(c)1982 Midnite Software, Inc., 1280 Richland Av., Lincoln IL 62656.

THE MIDNITE SOFTWARE GAZETTE NOTES

MIDNITE MEANDERINGS

by Jim Strasma

LINCOLN COLLEGE SUMMER COMPUTER SEMINAR:

The really big news this issue is our upcoming Summer Seminar. Lincoln College is PET Heaven here in Illinois--Commodore equipment all over campus, and also at three branch campuses (at Bloomington, and at Logan and Pontiac prisons). This summer, the week of June 19-26, we're going to put all that capacity to work. Jim Butterfield, Len Lindsay, Keith Peterson, your editors, and several other well-known PET personalities will be your faculty for a week of HEAVY computing. Beginner or expert, Lincoln, IL is the place to be this June. Bring the family, too. Besides the computers, Lincoln College offers a beautiful modern campus, indoor pool, softball field, tennis courts, Lincoln Museum (Honest Abe founded the town), and Railsplitter state park. We're also in a bustling community of 20,000, barely an hour away from other most major cities in Central Illinois. Save the date, save your pennies, and drop us a note at our Lincoln address. We'll save you a place, and send details as soon as we have them. Tentative cost is $350 per student, plus $50 equipment rental if you can't bring a computer. All profits go to Lincoln College's Computer scholarship and equipment fund.

NAME CONTEST:

Our thanks to all those who submitted alternative names for the Midnite/PAPER. Your staff (Bressler, Oldfield, and the Strasmas) have narrowed the list of entries to twelve. Now it's up to our readers to choose the winner. The name receiving the most votes will earn its author a VIC. Your editors also agreed with a fair number of readers, that regardless which title wins, we will keep the name Midnite/PAPER, and use as many entries as possible as section headings within our issues. Here (in alphabetical order) are the finalist entries:

Bits & Pieces
Computer Widow's Digest
Eye C.B.M.
Flagship
Interrupt Line
MidniteXPress
PaperSoft
Shift/Run
The Commodore's Log
The Nested Loop
The Orphan
The User Port

Send your vote to Jim Oldfield, 635 Maple, Mt. Zion IL 62549, by our next editorial deadline, January 1 (and include a thought for our next issue!).

ON COLLECT PHONE CALLS:

The bad news is we don't accept collect phone calls. The good news is I gladly call anyone back collect; just leave the request with Ellen. A cheap one minute collect call establishes where I can be re-called station-to-station.

SOLAR IS IN:

The rapid pace of electronic change was again illustrated for me today. Fellow PET owner Bob Bandy found my old calculator in his car. I was very glad he found it, since it cost $90 four years ago. Imagine my surprise, though, to find that a new solar calculator cost less than replacing the batteries! Not only isn't "new" technology worth repairing, it isn't worth keeping in batteries!

ADVERTISING NOTES

Surely you have seen all the ads in major magazines asking programmers to send programs to various companies for possible sale by them. A company called COMPUTERforce has a different angle. According to a recent ad, they CHARGE $35 just to look at your program. Should have lots of takers....-JS

ATUG NOTES

by Brent Anderson
ATUG Librarian

16 Official ATUG Diskettes as of 10/82:

To receive the latest annotated directory of ATUG diskettes, send me a letter-sized, double-stamped SASE requesting ATUG INFO. When ordering diskettes, send $10 per diskette plus a clear list of which diskettes are desired (SPECIFY 4040 or 8050 format). The Whole PET Catalog contains a recent annotated directory of all diskettes in our ATUG library.

Toronto PET User Group Diskettes in ATUG Library

To make TPUG material available and our exchange library helpful to new users, I am gradually documenting the monthly TPUG diskettes. Here is the first:

tpug disk apr/82 (NEWLY ANNOTATED)

auto disk boot	Load below files from menu	by Hacker
*alpha dir	Put 4040/2031/vic directory in alpha order	by Brandon
banner/r	Do ALL big CBM chrs on CBM printer	
c2 water/zebra 1	Brain teaser game	by O'Keefe
cbm 4032 v2.1	80 col screen act like 40 (quick set-up)	by Chee
change load addr	Sets load addrs on ALL CBM disks	by Brandon
codesaverl4	Data lines from machine code	by Moore
copy all	Disk copying selective of files & units	by Butterfield
data writer	Data lines from machine code (short)	
*family genes	Graphic demo, heredity theories	by Gamble
fine-plot demo	Double density screen plotting	
lump-sum inv 82 mpak	Lump sump investment analysis	by Roche
nl coins exercis	Brain teaser game (with coins)	by O'Keefe
pi demo 8032	Show pi calcs in 8032 screen windows	
pi hunt	Hunt pie thief (game)	by Dray
sl coin logic pu	Stripped coin brain teaser game	by O'Keefe
*school-marm	NEAT fill-in-blank educational utility	by Darnold
*scroll demo	Interrupt driven marquee on screen	by Bernstein
self-modify demo	Self-modifying program	
stock market!	Game with some graphics & sound	Sweet/O'Connor
*structure basic	Simulate structured BASIC on PET	
sunrise/sunset	Compute sunrise/sunset times	by Williams
superl	Manage catalog of diskettes	by Brandon
utp rs232	Terminal prg (need INTELCOM4 on tpugl/82)	by Brandon
wp lister.src	Source for WP LIST/SCREEN on tpug 2/82)	by Siebenmann
miniwordpro	Word Processor in BASIC	Macnaughton
*cross word	Create puzzle on screen/print on CBM printer	by Wood/Reid

CBM/PET PROGRAMMING NOTES

by Arthur Cochrane
and Jerry Key

WORDPRO 3+ Defaults:

When the question is asked about the many different printers, pressing RVS defaults the lines to 284, Spinwriter, printer device 4, and disk device 8.-AC

FALLING OUT OF INPUT:

Paul Zervas asked two questions: 1) how to protect from falling out of the INPUT statement, and 2) how to prevent a Ø from being printed.

REPLY: The simplest way to protect from falling out of the INPUT statement is with a default character. Try the following:

```
1Ø INPUT"What is your name[2 spaces][shifted-space][three cursor lefts]";A$
2Ø IF A$="[shifted-space]"THEN PRINT"[2 cursor-ups]":GOTO1Ø
```

Don't type the brackets; hit the character on the keyboard described within the brackets, instead. The cursor lefts will show as graphic characters, because you're in quote mode. The reason this works is that the three cursor lefts cause the shifted space to be placed in the position of the first character for the input. If only a return is provided, A$=shifted space (a valid character). Line 2Ø detects the shifted space value, which makes the IF true; that in turn makes the two cursor ups drive the cursor position to the line above the one where line 1Ø printed on the screen. This allows line 1Ø to print in its original position. Therefore, the input statement appears to remain in its original position as long as only a return is input. One caution: if a single character is printed and then deleted, the protection is gone. Substitute a Y in both line 1Ø and 2Ø for the shifted space for default input of a "y" character instead.

To prevent a Ø from being printed, add the following line:

```
3Ø IF A$="Ø" THEN A$=CHR$(16Ø)
```

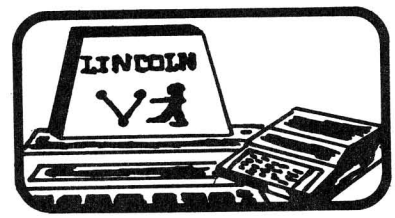
CHR$(16Ø) is a valid character (shifted space) but will not print. This would be used if you needed to hold a space open for where the Ø should have been for formatting. To eliminate it altogether, use:

```
3Ø IF A$="Ø" THEN A$=""
```

This will eliminate the Ø and the space it would have occupied. To test this, try adding a line 4Ø:

```
4Ø PRINT"TTT";A$;"TTT
```

Use the "" or null as a value for A$ and then the CHR$(16Ø) and note the difference.-JK



COMMODORE 64 NOTES

by Ken Penny

The Adventures of Max Maxwell, Electronic Private Eye

DAY TWO: Cable Combat

> Morning breaks to find Max Squared still locked in his lab, with the echoes of last night's orchestrations fading as quickly as the night. The lab looks like a wire factory, with cables everywhere. In a far corner sits Max, eyes glazed, looking at a tangle of wires on the solder bench in front of him. He has just spliced an IEEE cable to a 1541 serial cable and is wondering what to do with the other 20 wires....

The communications of the 64 are handled by something called the serial bus. This is a 5 wire serial network, with channel numbers and device numbers similar to the IEEE interface, but with data transferred in a serial manner, rather than a parallel manner. Thus, it is cheaper and easier to build (cable and interface, too) but slower than the IEEE....about 4 times slower.

THOSE PRINTER CABLES:

Commodore currently produces two VIC printers which interface to the serial bus: the 1515 and the 1525. Too light for an anchor and too flimsy to be used as a wheel chock, the earlier 1515 is best cast as a black hole into which to throw otherwise perfectly good money. It does not even accept 'regular' sized tractor feed paper, requiring a special paper about a half inch narrower. Both VIC 1515 and 1525 printer mechanisms are made by Brother, and have some severe service problems, such as the spring action carriage return. The 1525 is a better printer, using regular paper, but it's still good to know that several companies make RS232 and Centronics output boards for the 64, allowing it to run MX-80, Spinwriter, and other printers.

THOSE DISK DRIVE CABLES:

The 64 has another drawback: without an IEEE adapter, it only works with the 1541 disk drive. This is a slightly modified 1540 VIC Disk, with a mechanism made by Alps and DOS V2.6, almost identical to that in the 2031 single disk drive. The current sad situation is somewhat brightened by the recent change in Commodore retail prices, putting the 1541 at $395. At that price, it's not a bad drive, especially since it uses the same format as the 4040 and 2031 drives.

The salvation for the situation is an IEEE cartridge, allowing the present Commodore disk drives to access the 64 directly. Three companies now offer these [reviewed in this issue-ED]. Just think, you can now buy a $4000 hard disk drive for your $595 C64....

There are some considerations to using the 1541 with a 4040. Your results will be much better if you format new diskettes on the 1541 and just write to them on the 4040. The two versions of DOS differ slightly in timing, so that the 4040 reads and writes just slightly before the 1541. However, if the disk is formatted on the 1541, the 4040 will patiently wait for the data to come along before it does its read/write thing. With this one trick in mind, 2031, 4040 and 1541 disks will read and write interchangably. 1540 disks will also read fine on a 1541, but the 1540 itself will not work properly on the 64.

Understanding the 64/1540 problem requires understanding how the VIC chip works. When the VIC chip decides to refresh the screen, it tells the processor to stop for a moment while it gets the job done, a lot like a normal interrupt. Unfortunately, this takes about 60 microseconds, too long for a serial device to wait. The 1540 sees this pause and 'hangs up'. The change made to the drive to

make it compatible with the 64 (thus a 1541 disk drive) was simply to allow a pause to come and go without confusion on the part of the DOS. 1540s may be upgraded to 1541s with one ROM change.

THOSE CASSETTE DRIVE CABLES:

The cassette is also affected by this pause in the internal workings of the system. For that reason, the cassette routines turn off the screen while reading the tape. When a program is found, the screen comes back on so that you can see what it is doing. To continue the read, you must press a key. The screen blanks again and the load progresses. When it is done, the screen comes back. You may also turn the screen back on with a run/stop-restore key combination. This is handy for aborting tape reads that go on for over an hour...

In the operation of the cassette lies a clue to using the 64 with a 1540. If you turn off the screen, the problem is fixed. This works just fine, although it is a bit troublesome. The screen may be turned off with the command:

```
poke 53265,11
```

The best implementation is this:

```
poke 53265,11:load"name",8
```

When the disk drive lights go off, hit [run/stop] plus [restore] to bring back the screen.

This may also be done within a program, as when reading data files, sprite tables, program chaining, etc. Use the 'poke 53265,11' to turn off the screen, and 'poke 53265,27' to turn it back on.

EVEN MORE CABLES...:

Other peripherals seem to work out well. A VIC modem plugs in just fine, and works with slight software modifications. The standard VIC/Atari joysticks and paddles plug in the same way. The RF output of the 64 is on a standard RCA type jack, like the output of the modulator on a VIC. And both video and audio monitor outputs are available on the back of the 64.

All in all, realizing that the peripherals for a $595 computer can't be priced at $1295, Commodore has done a pretty good job of putting together a usable package. As we get smarter with the 64, and the jobs we ask it to do get harder, the hardware will still be available for a price.

> Max turns on his VOM and probes delicately into the cooling slots of the power supply, searching for a test point for its low voltage output. Darkness falls suddenly as the 60 amp breaker in the fuse box takes notice of a dead short on the 110V line. Sobs are heard from Max as he realizes that his VOM was set on the 10 milliamp scale...

PHONE: 217/735-2703

MIDNITE
SOFTWARE, INC.

JIM & ELLEN STRASMA
1280 Richland
Lincoln, IL 62656 USA

64 Notes from our Readers:

ADDING A RESET BUTTON TO THE 64:

This is fairly easy. All you need to do is ground pin 40 of the 6510 microprocessor. I did this by fastening one micro test clip to pin 40 and another to pin 21. Then I connected each to a tiny normally-off pushbutton with a small insulated wire. I mounted the pushbutton right next to the power-on light on top of the 64 case, but put yours wherever you like.

On RESET, the 64 does not wipe out its memory contents as PET models do. Therefore, by hitting RESET and then restoring a few program pointers, it may be possible to rescue a crazed program.-JS

64 BUG INSURANCE #1:

As reported last time, typing lines in excess of 80 characters on the 64 and then deleting back within the 80 character limit may cause you to lose control of your 64 system, requiring a reset. David Berekowski of Commodore Canada says this bug can be avoided by changing the color of your cursor. Apparently, using white or orange avoids the problem.-paraphrase of JK

64 BUG INSURANCE #2:

The 64 has trouble sending TAB() and SPC() to the printer. The fix is to precede these statements with " ", such as " "SPC(9). [Better yet, send a string of spaces alone.-ED]-paraphrase of JK

SPRITE COLLISION:

If VIC=53248, the start of the VIC chip, then:

1) to detect a sprite to sprite collision, use PEEK(VIC+30);
2)to detect a sprite to background collision, use PEEK(VIC+31).

Check twice to be sure. If either check claims a hit, then one has occurred. Sometimes a single check doesn't get the message.-FD and WK

Ron Larson in Hardcopy (CHUG's newsletter) further reports, "The sprite-sprite collision detector will only be activated if an 'on' pixel hits an 'on' pixel. The same goes for sprite-background collisions."-ES

UPPER-LOWER CASE CORRECTION:

Fran Donovan reports that when trying to use the POKE statement in your 64 manual to change from upper to lower case, you are in for an unpleasant surprise. What you get is unreadable! The correct POKEs are as follows:

```
upper case--POKE 53272,(PEEK(53272)AND 241)
lower case--POKE 53272,(PEEK(53272)AND 241)OR 2
```

Ron Larson reports in Hardcopy that CBM PRINT statements also work:

```
upper case--PRINT CHR$(142)
lower case--PRINT CHR$(14)
```

Here are 2 other important PRINT statements that Ron mentions:

```
PRINT CHR$(8) disables the <SHIFT><COMMODORE> key
PRINT CHR$(9) enables the <SHIFT><COMMODORE> key
```

CHURCH NOTES

by John Easton
Christian/Computer-based Communications

C.C.C. Update:

Of 400+ commercially available data-bases, NOT ONE addresses the needs of the Christian researcher, student, pastor, or whoever. Such a data-base, switch-accessible from a commerical center (such as the Source) might serve as a resource guide to Christian services, as well as a super Bible Reference and Concordance, Topical Reference, daily news, and even a humble Bulletin Board. Just thinking at the moment, but it will eventually come together somewhere. Why not build our wish-list of specifications now? How about INFOCHRIST for a name - think that would stand out in the SOURCE directory?

As a start, we are quietly checking out local large Christian charitable organizations - most of whom access or own some sort of mini or mainframe computer. The next step is to convince one of these that leaving a line or two open (at least in off-hours) to at least a small part of their memory-bank might not be such a poor use of expensive computing power.

Demo Programs

We have available a demonstration tape of 10 sample programs (all of which will operate on any 8K Commodore) for the nominal cost of $10 US or CDN. [From the above address, I presume-ED]

C.C.C. Demonstrations

At the large "First Annual" inter-faith Festival of Praise in Ottawa in May, hundreds of people visited our booth. Between our own booth and that of 100 Huntley Street (a Toronto-based popular Christian TV show and outreach organization), we had 8 Commodores in operation. We virtually had to rope off an area to keep one terminal free. TV, press and radio all picked up on the excitement, with resultant vital contacts among Christians in the Ottawa area. We even received offers to translate the programs to French....

And it had to come - one of the Ottawa kids that appeared out of the woodwork to assist us in manning the booth produced his own version of SPACE INVADERS. The mystery ship is SATAN, the invaders are SIN, SEX, etc. Don't have a copy here yet - he's still working on the problem of getting ALL the Deadly Sins into the normal SPACE INVADERS matrix, but what he demonstrated there certainly proved popular with the locals.

June found us at the Jesus '82 festival in Kitchener, Ontario - this time in a TENT. If anyone questions the ability of these computers to run under adverse conditions, they'd have had an eye-opener here among the dust and humidity of another weekend--continuous demonstrations from morning till midnight. Literally thousands passed through.

COMAL NOTES

by Len Lindsay

This issue finds Len Lindsay writing for The PAPER. Turn to the last section to learn more about COMAL's history and why LL prefers it over all other computer languages....-ES

COMMODORE NOTES

NEW SOFTWARE:

Question: How is the Radio Shack Model 16 like a bowling ball?
Answer: The same amount of software is available for each.

One of the problems with any new computer is lack of software, especially one using a new processor. Until about two weeks ago, the same joke could honestly have been said regarding the 64. However, lots of good programs are now either out or waiting only for extraneous details like packaging. This includes about half of the packages announced by Commodore at dealer meetings a month or two back. You'll find some of these reviewed in this issue. Still, some kind of prize has to go to Olympic Sales Company of Los Angeles, which is sending out catalogs full of Commodore gear, all seemingly in stock--ranging from EASY CALC and the the fabled Apple/Atari/TRS-80 loaders for the 64 to the BX256 model CBM. Not quite credible, but very well done. Oh well, there's quite a lead time in producing catalogs, too.

NEW HARDWARE:

A Chicago Tribune article last August announced two new Commodore products I've not heard mentioned elsewhere. If you've been wondering what Commodore might do for an encore after the current new line is completely out, here are two possibilities: a voice input peripheral to sell for under $100 (presumably like a model Voicetek has offered for years, but much cheaper), and a hand-held battery-operated personal computer with a built-in modem, selling for $300-600.

At our last CIPUG meeting, CBM regional manager, John Gould, passed out copies of a CBN article interviewing Ron Jeffries about the forthcoming 65000 processor chip. Jeffries said that "it can operate in different [data widths]..." and that "it's almost like a baby [Intel] 432, although that may be overstating it just a bit. The 432 is a chip set, while the 65000 is a single chip." To give a hint of CBM's ambition, Jeffries said the high end version of the chip is dubbed the "65000/VAX". The VAX is DEC's best-selling top-of-the-line minicomputer. According to Jeffries, the chip includes its own I/O controller, with a separate 22 command instruction set, similar to "the concept of channels on IBM machines.... It really would give Commodore a lot of flexibility. It could emulate a lot of different machine architectures."

I am sure Ron's information is correct as far as CBM's plans. Now it remains to be seen whether they can actually deliver such a chip in 1983 as planned and at half the prevailing chip price as planned. Thanks for visiting CIPUG, John, and for the good reading.

CURRENT SALES:

In the above article, the Chicago Tribune credits Commodore with 30% of the home computer market, and says CBM has posted 50%+ growth in both sales and earnings in each of the past 4 years. U.S. sales are up now, from 24% last year to 40% of CBM's business this year. According to the October 1982 Jeffries Report, November production figures for VIC alone are 9,000 per working day, with a planned total of one million VICs out by second quarter 1983. This compares very favorably for a new product to 500,000 total Apple II's, 3 million "Intellivisions", and 10.5 million Atari model 2600 video games.

SUPERPET UPGRADE:

The SuperPET user group (see separate review), reports a $30 upgrade is now available from Commodore, adding COBOL and a COBOL manual, and changing other languages and manuals. I have most of the upgrade, and it looks very good.

COMPETITORS NOTES

THE MELEN FACTOR FOR CHOOSING A COMPUTER:

Arthur Cochrane sent us a note in which Cromemco president Harry Garland describes a "simple performance measure for use in evaluating and selecting personal computer products", developed by Dr. Roger Melen.

$$\text{Melen's factor} = \frac{\text{RAM memory}}{64\text{K}} \times \frac{\text{Characters/screen}}{2000} \times \frac{\text{Disk storage}}{100\text{K}}$$

Mr. Garland found that price of personal computers under $5000 "varied roughly as the logarithm of the M factor." Here are a few sample values:

VIC + 1541 = .04, cost $ 650	
64 + 1541 = .85, cost $1000	Apple II+ + 1 disk = .49, cost $2000
8032 + 8050 = 2.50, cost $3000	TRS-80 III + 2 disks = 1.41, cost $2500
8096 + 8250 = 15.00, cost $4000	Apple III (has disk) = 2.60, cost $3500
8096 + 9090 = 56.20, cost $5500	RS Model 16 + 2 disks = 50.00, cost $5800

APPLE:

David Conley's comments in Issue #8 on uses for Apple IIIs got me thinking. The Apple Dumpling Gang should market a wooden Apple III. They could call it the PINEAPPLE.-John Ylimaki

The new "Super II" is out for software developers, and may make it to market after Christmas, at a cost anywhere from $450 to $1750. According to the Jeffries Report, at least one major software house has quit writing software for the II, and will be working only with its 68000 chip big brothers, code-named "Mackintosh" and "Lisa". These may make it out by June, though one source thinks Apple is just stalling, and won't really produce anything so soon. Lisa is slated to be quite expensive and may use a Unix clone as an operating system.-JS

IBM-PC:

The IBM PC is dominating the trade press, but don't buy IBM stock yet. The competitor hurt worst by the PC may be IBM. Despite booming PC sales, IBM's overall profits for the year are hurting. Who now wants to pay over $15,000 for a System 23 Datamaster, or $7,000 for a Displaywriter?

Hal Hardenberg reports that PC Pascal's trig values are incorrect.

TRS-80 MODEL 16:

In the June/July 80 Microcomputing, Wayne Green calls "The Model 16... A Debacle" and says of the Model II, "even the tiny amount of support that system got from the Shack seems destined to shrivel up...Model II owners are faced with owning an orphan." He estimates 50,000 M-IIs have been sold overall. On reliability, "The failure record for the MII has been sad, with service a major problem."

Rumours that the III would soon get an 80-column screen have faded.

Atari & TI:

These giants are in a pinch, discounting more than they like. TI cut its home computer price 1/3 this fall. Hard to believe they'll make money at $200, on a machine once sold for $1000. Merrill Lynch lowered its Atari investment rating after hearing of the TI price break. CBM stock also dropped. Investors foresee a price war.

COPYRIGHT NOTES

MONOPOLE: COPYRIGHT OR PUBLIC DOMAIN?:

MONOPOLE, a 2-player Monopoly game (see separate review) is newly available for the 64. Though labelled "(c)1982 by Tim Borion & Sal Oeper-8/12/82," this program is actually in the Public Domain, placed there over a year ago by its true author, John O'hare of CIPUG. It has been in our ATUG library since, and more recently also in the TPUG library, where it was once "game of the month". John says the usurpers' version has added some minor touches, such as color, but to those who have seen both versions, it is obviously still John's work. I fail to understand how messieurs Borion & Oeper thought they could copyright someone else's work, without so much as a thank-you REM to the true author.-JS

MORE ON WARRANTIES:

It's good we didn't identify the company with the anti-warranty last issue, because I've discovered several similar anti-warranties since. It astounds me that anyone would pay over $10 for programs without a warranty. Beginning with this issue, we rate warranty quality when known.

Here is a GOOD warranty, for Amplify, Inc.'s COMMUNICATOR:

> Amplify, Inc. guarantees the workmanship and quality of the interface board and the machine language program stored on the PROM for 120 days after purchase. The customer must supply proof of purchase unless purchased in the customer's name directly from Amplify, Inc. The warranty covers the first owner only and only the cost of repairs to the board or PROM. No other damages, such as loss of time, damage to equipment or records are covered. This carranty does not imply liability if either the board or PROM are damaged by abuse or improper installation.
>
> Before returning a board or PROM for warranty work or for any other reason, please call 319-351-4775 for an authorization number. The owner must send the equipment postpaid, and it will be returned postpaid.

REQUEST FOR CUSTOMER REACTIONS

> It is very difficult to test for all contingencies when developing and testing complicated software such as this machine language program. We have tested this product extensively for over a year, but we cannot guarantee that no problems (bugs) have slipped through our testing. We will make every effort to correct any problems we find or that customers find. This requires cooperation between customers and Amplify, Inc. We will furnish a free software update to the customer who first identifies a problem/bug that is verified by us. In addition, customers sending suggestions for improving the program which we decide warrant implementation will be supplied an update at no expense to the customer. We hope to encourage constructive criticism from our customers.

DEALER NOTES

WHEN ORDERING ACROSS THE U.S.-CANADIAN BORDER:

Ordering from another country can be traumatic, due to time delays, fluctuating exchange rates and customs hassles. Your best bet is to let a dealer do the importing for you. Short of that, Northern Bytes suggests these hints, taken from USR(80), the Journal of the Vancouver TRS-80 Users Group:

1) Most computer parts or peripherals are charged duty. Exceptions include diskettes and matrix printers.

3) Cassettes should be called "data tapes", because "duty on pre-recorded audio cassettes is much higher than that on data tapes....Small computer parts should be labelled 'computer parts', rather than 'electronic parts,' since the rate of duty on the latter is almost 3 times higher."

4) "Software is a real bargain -- you pay...duty only on the media....For example, for a $100 program on a diskette, you should only pay on the value of the diskette itself, about $5."

5) Customs clears most hardware under $20 and most software. If not, you will get a card in the mail. Just send the tax and duty listed as due. Customs "will only accept cash, certified checks, or money orders." You can also visit your closest Customs Postal Branch in person.

Here are some more suggestions from JS:

1) Order from companies used to shipping to the U.S. CMD, for instance, has an office in the U.S., from which they ship U.S. orders.

2) Order things one at a time.

3) Keep the total value of a package under $250.

4) Don't order C.O.D. across the border.

5) Send only 1-2 diskettes per package.

6) Expect delays. Minimum time to send a diskette via ordinary mail from Illinois to Toronto is 1 week. Registered mail arrives 2 days faster. One alternative is to send programs via modem, using a bulletin board system. RTC runs a suitable one in Toronto.

7) Expect to post a heavy CASH bond to take hardware across the border.

COMPUTER WORKS

In Issue 9 we mentioned a rumour about the ComputerWorks of Phoenix AZ reading Apple diskettes into a 64 at the San Jose Computer Faire. A reader who would rather remain nameless is sure the product does not exist. The October '82 issue of The Jeffries Report also discusses this 'emulator', the near-impossibility of its working, and Ron's difficulty in contacting anyone knowledgeable at ComputerWorks.-JS

DR. DALEY SOFTWARE is now TAMARACK SOFTWARE. Beginning Dec. 1, the new company will sell "quality software at extemely low prices" (see their ad in this issue). They have the same address, but a new phone number (406/821-4596).-ES

PROGRESS COMPUTERS is now out of business (as we discovered when a check bounced). Owner, Chet Lewis, has promised to make it good. Send your inquiries about their products to him at 7073 Lynnetree Way, Citrus Heights CA 95610.

NEW ILLINOIS DEALERS:

Publisher, JO, manages the newly-opened Micro-Pace Computers in Champaign IL. Call him if you need anything unusual for your VIC or 64. He stocks such niceties reviewed in this issue as the C64-LINK from RTC, the ARFON mother board for VIC, the VIE IEEE interface for VIC, GORF, OMEGA RACE. This new store has lots of customers already, and all seem satisfied. Only one defective unit so far, and it was exchanged on the spot. Highly recommended.-JS

Welcome also to Computers & Video, our CBM dealer in Lincoln, IL. It's managed by Virgil Lowe, a warm-hearted Christian. Virgil isn't afraid to admit what he doesn't know about computers and tries hard to please. So far his only problem is sending things away for repair, and his only mistake is the Apple III. Recommended.-JS

DISK NOTES

SuperDOS is here!:

Commodore now has a version of SuperDOS (2.7/3.0) for 8050 disk drives, in stock at Santa Clara. This is the DOS used in 8250 and D90 series drives. Tentative price is $70. To upgrade your disk drive, your local dealer may order:

for Micropolis drives--part #321-626
for Tandon drives------part #321-627

Handling Relative Files:

Starting this month (12/82), my version of a relative record file handler package by Chris Bennett will be featured in a series of articles I've written for Micro magazine. If you need help understanding either relative records or BENNETT'S MAIL LIST, be sure to get the next 6 issues of Micro.-JS

8250 Disk Drives:

When using an 8050-formatted diskette in an 8250 machine, you must try the first disk command twice (even DIRECTORY) before it will work. The first try gives an ILLEGAL TRACK OR SECTOR error message. Because of this, menu-driven programs may have to be copied to a diskette formatted on the 8250, [or perhaps by the 8050 upgrade above.-ED] Copying can be done with the COPY command. Then it will function properly from the first try.-WK and FD

On the other hand, 8250-formatted diskettes should have no problem when used in an 8050 disk drive, as long as they're less than half full. The disk drive will be unable to access programs or data recorded on the second side of the diskette, giving an ILLEGAL TRACK OR SECTOR message.-J&ES

1540 and 1541 Disk Drives:

The 1541 disk drive for VIC and 64 is available but in short supply, due to extremely high demand. Changing one 8K ROM chip upgrades existing 1540 drives. VIC owners don't need it, but if you have a 64, you need it badly. Otherwise, you'll have to do a 'POKE 53265,11' everytime you want to load or save a program. Then the screen will blank until you either do a 'POKE 53265,27' or hit STOP+RESTORE. To avoid this, I slightly modified Commodore's DOS 5.1 to do both POKEs automatically. It's called DOS 5.11 on our 64 exchange diskette. Anyone unable to find the 1541 upgrade may order it for my usual $15 copying fee.-JS

PEDISK II disk drives:

John O'Hare has written six useful programs in Upgrade BASIC 2 for PEDISK owners, which allow users to add menu selection to their diskettes, plus text substitutes for CBM cursor control characters to be listed on a letter-quality printer. JOH and CGRS Microtech both sell the MENU programs for $10. John also wrote an EXCELLENT utility package sold by CGRS for $25.

To use these programs, first run the CREATE program on the diskette you want to contain the menu program, giving it a name and password. Then save a copy of HELLO and MENU ADDitions on diskette. Next, for each program you want included, 1) run MENADD, 2) enter the long description, 3) enter the program's name, 4) choose the password option, 5) type !run"hello:0" to access the menu of programs just created, and 6) type the letter of the program you wish to run.-JO

EDUCATION NOTES

Sam Cook of the SCOPE user group in Dallas TX, has written a little program he calls GRADEBOOK "for the teachers to keep their grades in; it averages the grades, permits the lowest grade to be removed, assigns letter grades and prints the results using compressed type on the Epson printer."-ES

CHUG has "a tremendous SPANISH-ENGLISH FLASH CARD PROGRAM. The program can also be used for French or German or any language study. Just feed it groups of words and they are saved as a file on the disk, ready for instant call and use."-Slim Wilson in Hardcopy

The WRITING INSTRUCTOR:

We received an announcement from The Writing Instructor, "a quarterly journal on the teaching of composition," asking for "articles, reviews and exercises which relate the computer to writing instruction" to be published in its Summer 1983 issue. Issue Editor Randall Adams wants 2 manuscript copies, of no more than 15 pages (internally documented), on such topics as: computer-assisted instruction (especially personal classroom experiences in "writing"), computer-aided assessment of student texts, the "use of word-processing interactive computer programs for composition", and reflective essays on computer implications in the humanities. If you're still interested, contact him at TWI, c/o The Freshman Writing Program at U.S.C., Los Angeles CA 90089-1219. Include a SASE and a vita.-ES

HANDICAPPED AIDS:

Cacti Computer Systems, of 130 9th St. S.W., Portage la Prairie, MANITOBA Canada R1N 2N4, sent us an announcement of their complete keyboard system for CBM/PET, Apple or TRS-80. Designed so that handicapped persons with minimal use of hands can run commercial software with few key presses, it consists of a large 11"x21" pressure-sensitive keyboard, mask, interface and driver routine, at a cost of $649 (CDN). If any reader has one of these, PLEASE send in a review.-ES

MIDNITE GAMING NOTES

by Jim Oldfield, Jr.

STAR TREK REVISITED:

Since the days of "Only Mainframes", computers and Star Trek simulations have entertained many a third-shift programmer. It was only natural that Star Trek simulations would eventually filter down to the microcomputer level.

Two of the first commercially available treks for PET (and best around) were STAR TREK 2 and STAR TREK 3 from Dr. Daley Software. STAR TREK 2 was unique, with real noises (CB2 sound effects). With klingons, photon torpedos, and an on-board computer, it was a very easy one to play: you would input a command and hit RETURN. STAR TREK 3 even featured real-time action! In other words, you had to enter commands or face adverse actions from the bad guys. Neither game used graphics; letters stood for everything, such as (E)nterprise and (K)lingons.

Next came WORLD'S BEST STAR TREK from Dad's Reliable Software. It WASN'T the best. It featured real-time action and used the same letter graphics, but was played differently. You used your thrusters to maneuver, as you were moved randomly around the screen, and could see your missiles fired. If you travelled too fast, you landed in the twilight zone. For what was available, it was OK.

Instant Software gave the PET world a GRAPHIC Star Trek game in TREX-X (reviewed in The Whole PET Catalog). It is still the ONLY one that uses true graphics with real-time action.

Personal Software Inc. (now Visicorp), then produced TIME TREK. It's still the BEST trek-type game for the 8-32K PET commercially sold today. (See its review in The Whole PET Catalog.) With good sound effects, constantly updated screen, moving bad guys, and eight levels of play, I still enjoy playing it.

STARBASE 3.2 by Dynacomp, Inc. is yet another version, converted from an old mainframe. Written for all personal computers, using the minimum conversions necessary to run, it' no better than Daley's first treks. It's only unusual feature is an occasional message telling you to save a star base under attack.

Is there no hope for us trekkies with our PETs? Yes, but only through your local user group! TREK 80P by Bruce Berry and converted to PET by Jim Strasma is by far THE BEST Star Trek around. Using 32K, it has nearly all features you'd want. Although it does use simple graphics, it's more of a thinking type game. Real-time interaction plus a large list of commands and options requires you to read the instruction sheet. The object is to not only destroy all 'baddies' but also protect cargo carrying Tugs vital to your starbases. It uses some of the best PET CB2 sound effects while the action gets hectic during ten levels of play. A typical game can last well over an hour.

HAM NOTES

by Clark L. Stewart, W8TN

This column provides information to ham radio operators who use CBM/PET computers. However, it works best when you readers take the time to tell me of programs, hardware, and hints and kinks which you have found beneficial. I then spread the word so that many benefit from your experience. Speak up!

PET NETs are: Saturdays at 8:30 a.m. EST on 7.156 MHz +/- and Sundays at 12 Noon CST on 14.240 MHz +/-. If HAM PUG stuff is new to you, send me an SASE with $0.37 postage and indicate that you want the HAM PUG list and newsletters.

I have started putting together a ham PET users library. I have K4EVY's RTTY print subroutine for the Macrotronics M650 program, a number cruncher to determine the AZ-EL of the moon at any time from your QTH, a game to test your knowledge of DXCC prefixes, a program to calculate the time of sunrise or sunset, and one to calculate the range and bearing between any two points on the earth's surface. If you have programs to donate, please send them to me on cassette or 4040 diskette. I'll return it with the rest of the library.

I am planning to write a contest dupe check/logging program. The On Line column in October QST plans to offer program routines for this project in future issues. If you have done work along this line, please let me know.

A Canadian ham has a 4.0 modification of the M650 program. Since it does not require the Macrotronics hardware, it could be used with your own TU and AFSK board. K8ERV is looking for an RTTY program for his 8032.

I am still coming back down to Earth after attending the October meeting of the Toronto PUG. It felt more like a convention, with 400-500 PET users present. Their October TPUG diskette (and now our HAM PUG library diskette) contains the Hobbyscoop NOS BASICODE translator program from Radio Netherlands. It offers a way to exchange programs between different brands of computers and will be used on international short wave. Listen to the "Media Network" program each Friday (Thur. GMT) at 0250 and 0550 GMT on 6.165, 9.590 or 9.715 MHz.-73, de W8TN

Comment on MACROTRONICS M650 INTERFACE:

"I also use the Macrotronics M650 interface for radio teletype. Works very [well]."-Albert Kozak WD4KDY

MODEM NOTES

by Tim Tremmel, SYSOP
Racine BBS (414/554-9520)

While running a CBM/PET BBS, there are two questions I "hear" often:
1) What is the program ACCESS code?
2) I sure wish we had a CBM/PET BBS close by! How do I start one?

The answer to question #1 is: EEZOO, but keep it to yourself.

This password, given to you when you received the terminal program, only insures you are using the proper program. While any terminal program will access the BBS, you MUST have the special terminal program to use the up/download features. Currently, it is only available for CBM/PET/VIC computers and works with either IEEE or RS-232 modems. You can get the Terminal Program from TPUG, ATUG or from the SYSOP of a BBS. Updates for downloading are available from the various Bulletin Boards. [We now have the latest terminal diskette for all models - available for our usual $15 copying fee-JS]

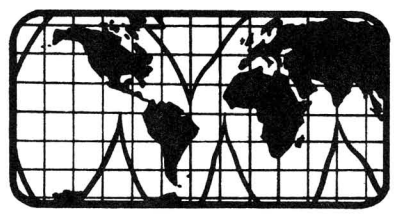
Question #2 is the easy one:

It's much easier than you think to start a CBM/PET BBS. The software, as it is now written, uses a CBM 8010, Livermore Star IEEE modem, [TNW103, or Hayes Smartmodem.-ED] Your local CBM dealer can order the software for you from Commodore Canada. I would suggest that they send a certified check or money order and mark the envelope plainly. [See the discussion under Dealer Notes.-ES] After it arrives, contact other SYSOPs about available improvements. You need a CBM/PET (32K, BASIC 2 or 4), 4040 or bigger disk drive (with DOS 2), and the modem. You also need some version of WORDPRO, and a Novation Super-Mic wouldn't hurt. The diskette should contain the BBS programs, many examples of sample bulletins, and WORDPRO instruction files, which you should read over a few times. Also in the files is a schematic for a simple auto answer device.

New U.S. CBM/PET BBS's since The Whole Pet Catalog was printed are:

St. Louis MI	314/625-4576	(Tony Ott, SYSOP)
Indianapolis IN	317/255-5435	(Tim Renshaw, SYSOP)
Commodore Chicago	312/397-0871	(former dealer no. now for all)
Rockwell PCC, TX	214/996-7994	(Don Lambert, SYSOP; 5pm-8am)

Give them a call, and leave a message to at least say 'HI'. If you have problems or questions, don't be afraid to leave a message to SYSOP, or call me at 414/554-9520. Part of learning is asking questions, and we all have to start somewhere. If you start a BBS, be sure to notify one of the other Boards.



READER QUESTIONS AND COMMENTS

QUOTEABLE QUOTE:
"Software is the boob behind the tube..."

RE: CHESS PROGRAMS:
"I'm looking for a chess program for a Commodore 4032. You mentioned 3 in a recent article [SARGON II, PETCHESS, MICROCHESS]. Where are each available? Cost of each? In your opinion, which is best?"-Morris Judson

REPLY: Of the three, only the VIC version of SARGON II is being actively advertised. To add to your confusion, another VIC chess program, named BOSS, is advertised by Audiogenic Ltd. It supposedly beat SARGON II.

For your 40 column screen, the best choice is SARGON II, also available in VIC and 80 column versions. Cost is about $40. It beats the socks off MICROCHESS. The VIC version is available through Commodore, but the others are sold only in Europe by Hayden. Hayden U.S. reportedly has never heard of SARGON II for PET. Some user groups have it.

PETCHESS, from England, is apparently only available for 80 column screens. It costs $50 from ACT Ltd. of England. MICROCHESS, once the only chess game for Commodore, cost $20 in 1978 from Visicorp, under their former name of Personal Software. The BASIC 2.0 version works on 4.0 after 1 POKE.-JS

USER GROUP NOTES

SUPERPET Users Group: See under Magazine Reviews.

CALIFORNIA:
SFVCUG (San Fernando Valley Commodore Users' Group, Canoga Park CA:
Meets on the second Wednesday of each month at 7:30 pm at the General Computer Store, 22323 Sherman Way, Canoga Park CA (213/700-7734).

SAN DIEGO PUG, San Diego CA:
This long-standing and active group meets the third Thursday. Contact Jane Campbell, P.O. Box 7776, San Diego CA 92107 (912/277-7214).

ILLINOIS:
CIPUG Affiliate Groups:
1) PANA: A VIC 20/VIC 64 Users Support Group in Pana is being organized by David R. Tarvin, 114 S. Clark St., Pana 217/562-4568). Welcome, David, and best wishes to both you and your new VIC dealer in Pana.

2) LINCOLN: Lincoln may end up with two groups. One has already started--an EXPLORER SCOUT post of 40 members organized this fall by avid PETter, Tom Zurkammer of Lincoln College. Besides the youth, half a dozen adults have CBM equipment, just on the LC faculty! Others are interested from Virgil Lowe's new store. So far, we meet informally, with folks dropping by here.-JS

3) By year's-end we expect to have branches in CHAMPAIGN, LINCOLN, MACOMB, QUINCY, PEORIA, OLNEY, and PANA, in addition to our main group in SPRINGFIELD. Present plans call for meeting quarterly, with local meetings the other months.

TEXAS:
RPCC (Rockwell Personal Computer Club, Richardson TX:
RPCC now meets at 5:30pm on the second Tuedsay of the month and runs a PBBS from 5pm to 8am. For more information, call their bulletin board at 214/996-7994 or Don Lambert at 3200 E. Renner Road CS7, M/S M01-125, Richardson TX 75081.

VIC NOTES

VIC Midnite Gaming:

by John O'Hare

Arcade Favorites on your VIC:

All you "regulars" at the arcades who also own a VIC can now play your favorite games at home, but some names have been changed (to protect the innocent?). GORF and OMEGA RACE are faithful reproductions of their arcade counterparts. Others, though, have been changed some. Here is a list of popular arcade games and the closest VIC equivalents I've seen:

ASTEROIDS:	UMI's SATELLITES AND METEORITES and Skyles METEORS.
BESERK:	UMI's AMOK has everything as in the arcade, except evil otto.
CENTIPEDE:	Online's MILLIPEDE or Nufekop's EXTERMINATOR (my preference).
CIRCUS:	CLOWNS by Commodore is best.
DEFENDER:	The best are HES's AGGRESSOR or UMI's SPIDERS OF MARS.
FROGGER:	The closest I've seen is DES's HOPPER.
GORF:	Commodore's GORF.
HEAD-ON:	Commodore's CAR RACE or Code Works VIXEL 1.
MISSILE COMMAND:	Nothing comes closer than UMI's OUTWORLD (same basic idea).
NIGHT DRIVER:	Commodore's MIDNITE DRIVE is better than the original.
OMEGA RACE:	Buy Commodore's version of the same name.
PACMAN:	The best are CBM's COSMIC CRUNCHER and Microdigital's SNAKMAN.
RALLY-X:	Commodore's RADAR RATRACE is same game with different graphics.
SPACE INVADERS:	The best are Commodore's VIC AVENGERS and UMI's ALIEN BLITZ.

Hints:

If you have a Zenith or Sylvania TV hooked to your VIC, a POKE 36864,133 will improve your picture quite a bit.-paraphrase of WZ

WANT ADS AND ANSWERS

WANTED: a better Print Using.

ATUG member, Lee H. Crisler, of 4848 Clinton Blvd. in Jackson MS 39209 requests "a print using routine similar to COMMAND-O's, but without the limitation of 79 characters and the forced carriage return and line feed. This command would allow for 136 column printers, automatic rounding, right justification of numbers, and output in true ASCII... It would also reverse the format string for printers that print in reverse.

REPLY: See the review of MASTER in this issue.-JS

WANTED: A Soft ROM which can be used on the 8096.-Lee Crisler

REPLY: Nearly all Soft ROMs are available on request in "lay-down" versions that fit under an 8096 board. But why bother? The 8096 is itself a giant SoftROM. Personally, I remounted my 8096 board upside-down up under the video board, where it doesn't interfere with anything else, including stand-up SoftROM boards. The only hard part was lengthening the short power cable between the new and main boards.-JS

WANTED: WORDPRO 3+ modifications to work with Graphtrax Plus in Epson printers. Make WORDPRO send Epson ESC sequences for underline, bold (double strike), and superscripts/subscripts.-AC

CBM/PET REVIEWS

Here's a rough guide for all you potential reviewers to follow when sending us reviews and comments on your favorite or unfavorite programs. The information can usually fit on both sides of a 3x5 card:

```
REVIEW FORM     Reviewer:
Program/Equipment Name:

(Author):                    Circle Hardware needed:
Price:                              C:C2/P2/80col/64/
Distributor:                            40col/VIC/MAX
Type of program/equipment:          D:9000/8250/8050/
Memory required:                            4040/1541
Protection:                           DOS: 3(2.7)/2/1
Language: BASIC2/BASIC4/ML/Other:     P:CBM/VIC/ASCII
Format: cassette/cartridge/diskette
Warranty quality:
Manual quality:
Special features:
  graphics: hi-res/PET/sprite/turtle/other:
  joystick: optional/required
  sound: CB2/VIC chip/other:
  other:
```

```
        side 2

Pluses:


Minuses:



Comments:
```

BOOK REVIEWS

CBM PROFESSIONAL COMPUTER GUIDE, $15 Osborne/McGraw-Hill.

"Kudos on new CBM Pro Guide! It wraps up all the bits & pieces on this elegant machinery in one tidy easy to use volume...thanks & once again congrats-Frank C. Remail

SOFTWARE SPECIFICATIONS, free from Commodore. For 8032/8096 and disk.

Finally, a quick pamphlet guide for comparing the capabilities of the many business programs on the market. Mostly covers packages designed for the 8032/8050 combination. Even gives "pluses" and "minuses", and type of security required. Of course, it doesn't comment on product reliability or bugs, although the order in which the products are described (within a category) indicates their relative importance! How about a semi-annual update, Commodore, and companion guide for the 64 programs now appearing? Could even be in looseleaf form, for quicker updating...-ES

Waterloo MicroCOBOL, $10 from Howard Sams or Commodore.

The manual for the COBOL upgrad to SuperPET is here for review. It looks very good so far, matching the other manuals very well.-JS

BUSINESS REVIEWS:

Accounting Packages

DATABOOKS & DATAPAYROLL, by B. Prouty, about $200 from Datamaster. Requires 32K and any CBM dual disk drive. 2 programs.

Capacity: 500 vendors, 500 customers, 1000 invoices, 3000 journal entries and 171 ledger accounts. This is the ONLY full accounting package I've seen that works with a 40 column screen and a 4040 disk. It is also the only one to allow full use of both disk drives for data. With minor changes and smaller file sizes, it should work on the 64 (planned soon.) With everything in a single BASIC program, such changes are easy. Despite its small size, DATABOOKS has some advanced features, such as lower case and a ban on ending with unbalanced books. Even prints its own simple forms.

Speed is adequate. Can be compiled. Manual is brief and ingenious--each screen prompt matches a paragraph, guiding even those who only read manuals when lost. The only problems are a small omission, no index, and no sample data diskettes. Includes sample printouts and author's phone number for help.

A separate DATAPAYROLL program links into DATABOOKS, or can be used alone with 1 disk drive. It allows 100 employees, and is set up for California. Changes for other states are available.

Fairly well protected against fraud with disabled STOP key, 2 level password, and its refusal to alter much of anything, except with a new journal entry. On the other hand, even honest changes, such as deleting an unused account are also forbidden, though author Prouty plans to fix that. My need for editing and some inflexibility in preset relationships between accounts, eventually led me back to B.P.I. for our Midnite books, but DATABOOKS is still my second choice. Recommended to all, and highly recommended if you only have 40 columns.-JS

Data Base Managers and Mail Lists

THE ADMINISTRATOR, $650 from Professional Software.

For about twice the price of its INFOPRO, reviewed below, PSI also offers what looks to be a FAR more capable database manager. We have seen it favorably reviewed in British journals (where it was developed), and heard from a very happy and knowledgeable user here. Includes a way to relate two files, somewhat like SILICON OFFICE. Worth looking into.-JS

INFOPRO, $295 from Professional Software. Requires 80 columns and CBM disk.

Uses 2K ROM at $9000. Anti-warranty. Simple relative file manager based on CREATE-A-BASE. Capacity: 999 records of up to 12 fields, totalling about 140 characters, OR 650 of up to 24 fields, totalling about 230 characters. Each field may be up to 39 characters. It's hard to imagine a $300 package offering only 2 record sizes and 650-999 records. Bennett's public domain MAIL LIST offers higher capacity and more flexibility for free. Of its strengths, only 3 seem better than matching features on the less expensive MANAGER package from CMD: INFOPRO supports ASCII printers, browses through records very rapidly and can easily insert new fields in existing records. Still no word on what if any support "Create-a-base" customers may expect under the new name.

As readers know, PSI once intended to use my SUBSORT in INFOPRO, without asking me. PSI still ignores my letters, though they found time to object to my previous comments on INFOPRO in another magazine. Special thanks to the dealers who allowed me to see INFOPRO for review.-JS

JINSAM EXECUTIVE, from Jini Micro Systems.
This long-awaited package has arrived for review in the next issue.

MASTER, $300 from CMD.
A programmer's aid so complete it can form the basis of a very sophisticated data base manager. See review under Utility Reviews: Programmers' Aids.

Updates:

SILICON OFFICE:
There's now a new version of SO available for the D90 series hard disks. It still requires an 8050 disk in addition, in order to boot the DOS-protected program diskette each time it is run, and to hold backups of files. The hard drive must be Unit 9. Chief advantage of the new version is its ability to have a single file up to the capacity of the hard disk, AND back the whole thing up on 8050 diskettes. It's also nice to be able to have 30 files instead of 6, and to have data and work files on the same drive. You may also scratch data files from within the program now, and send special characters to printers. No word here yet on an 8250 version. The existing 8050 version crashes on the 8250. Still highly recommended--we keep our subscriber records on it.-JS

THE WIZ:
Dr. Daley reports he is eliminating the ROM boards the WIZ needs, because he can't find them to buy. He has provided several updates for our pre-release copy, correcting various early bugs. We're now using it for our 6,000 name mail list on three 8050 diskettes of linked data at the college. All the data is in now, and our programmer has repaired the damage caused by an early data entry error. The package has a LOT of potential, especially since its price has dropped 80%, to $90. There's nothing else I know of on the market with this capacity except the new SILICON OFFICE for the CBM hard disk; it costs about 45 times more than WIZ once you add the needed hardware!

Word Processors

PAPERCLIP, $125 projected from selected Commodore dealers.
If you like WORDPRO, you'll LOVE PAPERCLIP - the documentation is due out 13 September - that's how new it is. Batteries Included have promised me a copy for review as soon as the domcumentation is finished. Is thoroughly compatable with WORPRO, right up to version 4+. Works just like WP4+ (on ANY type of machine with 4.0 ROM) plus 1) will SORT columns or lines of text, 2) do the arithmentic stuff that 4+ does, AND 3) will format the screen in up to some 126 horizontally-scrollable characters. Great for formatted output to a wide pinter - now you can line up the columns on the screen! As a preliminary observation, I'd summ arize PAPERCLIP as ****.-John Easton

PAPERMATE 60, by Michael Riley. $40 from AB Computers. Versions for all models, including VIC and 64.
The only thing wrong with PAPERMATE is that MR failed to do two things: add a dummy ROM and sell it for $300. Then it might have been the user group "standard", instead of WORDPRO. With PAPERMATE, I crank out a weekly bulletin for my SERTOMA club, monthly bulletin for our Commodore User Group (SNUG), and free lance writing. (I have nothing against WORDPRO except its price.) With 2 initial lines of format commands at top of first page, start typing and never look back. What I see on the screen is what I type. I avoid numbers running like mad on top like WORDCRAFT. I don't care how many lines I have typed or have left. A 32K PET gives enough warning before I run out of memory.

I can have the typed text not only page up or down, but also give a "screen line count." To do other things, hit SHIFT CLR/HOME for a MENU: "S" is SAVE; WRITE is "W"; PRINT is "P". No control key stuff is there to confuse me. To look at the copy on the 8032 before printing, I press "P" for PRINT and device number 3 (for screen) to print exactly as it will look on the printed paper.

Links copy on two full diskettes in a 2040 disk drive without GLOBAL. Files may hold over 200 text lines. Can automatically create and store "Table of Contents" file as it prints. I can LOAD and "ORDER" that table of contents containing each chapter's "page number" beside each listing; PAPERMATE creates an alphabetical listing...for an "INDEX".

PAPERMATE may be a shade slower than WORDPRO, but only if text is justified. Garbage collection with BASIC 1 or 2 may shake you up, but 4.0 takes care of that. Since my original manual was for earlier versions, and contained a poorly written file of instructions, I wrote my own manual. When I rushed my diskette(32PM), back for the PAPERMATE 60 update, I got an identical diskette back, with a "new" spiral-bound manual -- but not a single word changed. Includes WORDPRO to PAPERMATE program, version for 737 printer, and can be modified for other printers. When used on either the 4032 or 8032, action is identical. If anyone wants my own PAPERMATE (32PM) 60 manual to back up the official manual, ship me a diskette plus postage (to get the manual -- NOT the program). You need the program to copy the "manual" off the diskette.-Conway L. (Slim) Wilson, 4145 Lakner, Beaumont TX 77705

RTC-4, $300 from RTC.

See separate review of version for the 64. This version also arrived for review, and appears even more powerful than the 64 version. It will be fully reviewed next time, along with RTC's promised companion mail list program.-JS

WORD PRO 4 PLUS Update.

"I am becoming more comfortable with WORD PRO 4 plus--but it does have some deficiencies--the shortness of each file being a major one. And I think, frankly, that the manual, although no doubt thorough, is very poorly organized, rather poorly written, its page formats dreadful, and its indexes virtually non-existent. The same essential system would be so much more useful if the user were given ready access to its powers."-Carl Cohen

[Look for a quick reference guide to WORDPRO next issue!-ED]

EDUCATION REVIEWS:

MASTER GRADES PROGRAM, by James Cox & Michael Horner, $60 from Midwest Software. Requires 32K and disk drive.

REVIEW #1: Program is user friendly and provides educators with a useful grading procedure. It takes time to set up class lists, but weekly updating goes quickly. Six print options provide teachers with all necessary lists for various grading procedures. Progress reports are handy: user can change the wording, has both proficiency and deficiency letters, and has signature line on deficiency notes for parents to sign and return.

Use gradebook pages to enter weekly grades. Has one drawback for small schools with several grade levels in one class: it automatically sorts all students in one alphabetical order, although it can still print out one grade level at a time. Uses numerical grade points. Allows user to set grade scale, though it calls for plus and minus grades (rarely used in schools today). You must weight scores in numeric points according to importance, because program averages all test scores together equally. Even with limited computer experience, most teachers could use this program for all grading procedures.-MA

REVIEW #2: This is a good example of a product tempered by heat. When first sent to us for review, I considered it much inferior to VISICALC for my own use in keeping class records, both because it wasn't idiot-proof and because it didn't allow realistic editing. Friend Norm Eisenberg of Midwest Software took that as a personal challenge, sending improved versions all summer. I think he finally succeeded: I'll use it next semester. Recommended.-JS

PIEGRAM, $4 (on Cursor cassette of 5 programs) from The Code Works. Educational game for any PET.

BASIC. No sound. Object is to find hidden pie-thrower by calculating past throw results. Easy to play; non-violent. More instructions would make excellent geometry/algebra teaching aid. A random game for elementary age; a math game for high school age. Recommended.-Ted Spencer

GAME REVIEWS

GUNS OF FORT DEFIANCE, from Avalon Hill. 16K.

Operate a cannon in the War of 1812 to fight off cavalry, infantry or artillery troups. Choose from five types of ammunition, some requiring setting a fuse length. Very realistic game with very good animated graphics.-JOH

POKER PARTY, from Dynacomp. Needs 16K.

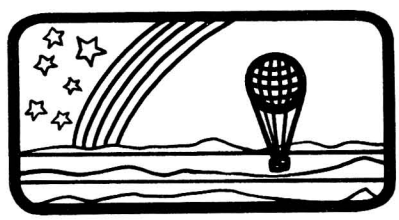
What a thrill! Watch your computer play poker for you as though via remote teletype screen; watch it ask for no more human input than one character a minute; but don't expect to watch the cards--there aren't any. Even if you LIKE computer poker games, you won't like this one!-JS

STARBASE3.2, from Dynacomp. Needs 16K & 40 column screen.

The perfect protection against software piracy; a product not worth stealing! A barely-graphic thinly-disguised Startrek, without even sound to add interest. Better versions are available in every user group library around.-JS

TELENGARD, $23 tape, $28 diskette from Avalon Hill. 32K.

Fantastic dungeon and dragon game for PET. One of the best PET games I've ever seen. To build up your character's experience points, you collect treasure (and cash it in at an Inn), kill many monsters, and other ways better left secret. Plays close to real DUNGEONS AND DRAGONS. You find shields, swords, safes, chests, fountains, thrones and other things in the dungeon, and use a minimum of 6 magic spells (you gain more with experience). Characters may be saved to tape or diskette for later use. Has over 2 million 'rooms' in the dungeon (50x200x200 plus 30 Inns; how they did it, I can't figure out!). Very good graphics game. Very highly recommended.-JOH



HARDWARE REVIEWS:

Cassette and Disk Drives

CBM 9090 WINCHESTER DISK DRIVE, $3495 from Commodore. 7.5M byte hard disk. For CBM/PET models.

Similar in size and appearance to a 2031 floppy drive, but easily distinguished by its noisy fan. I love its huge storage capacity and ease of use. It works just like other CBM disks, except for its huge file capacity. The entire drive may be dedicated to a single file--enough room for 25,000 records of 250 or so bytes each. Unlike hard drives of some competitors, it dynamically allocates file space efficiently, and automatically reclaims space used by scratched files. As you would expect, it is also quite fast at internal operations, such as CATALOG and RENAME. Of those, only HEADER is time-consuming--17 minutes.

Fortunately, HEADER should be rarely needed on this drive. On the other hand, external operations, such as LOAD and SAVE are often necessary, and are no faster on the D9090 than on the 4040. HEADER has an even more serious problem: nothing keeps you from HEADERing accidentally--no write protect switch or notch. Another problem is unwillingness to accept calls to drive 1, needed by many commercial programs. A faster backup program has been developed, but is still nowhere near fast enough. A smaller problem is that the D9090 usually needs to be initialized when first switched on in the morning.

Since hard disks are also quite fragile, this is not a disk you can safely haul around with you. On the other hand, it is immune to common diskette hazards like dust, nearby phones ringing, etc. Overall, it is a good, but not giant, step forward for Commodore. Companies needing top speed and large files in stable or dusty settings, for programs that can live without drive one and users skilled enough and loyal enough not to HEADER the drive may love it dearly, especially if they get a long enough cable to keep it in the next room. Others may do better with the 8250. A similar D9060, 5M byte hard disk is also available, for $2995. Of the two, the D9090 offers more storage per dollar.-JS

CBM 8250 DUAL DISK DRIVE, $2195 from Commodore. Two megabyte floppy disk system. For all CBM/PET models.

Outwardly an 8050 with twice the room, this is my favorite Commodore disk drive. It uses the same diskettes as the cheapest VIC disk drive, but each 8250 diskette holds as much as an entire box of diskettes for the 1541. Unlike the D90 series hard disks, its capacity is multiplied by inserting new diskettes. Operates faster than the 8050, and never has to be initialized before working. Formatting and backups take the same time as on 8050. The Micropolis drives are rock-reliable. (Earlier plans to use Tandon drives were scrapped.)

Mine came without manual or demo diskette, but the manual is the same as on the D90 series, which I'd already seen, and a demo diskette is presumably coming later. The main need for a manual is in converting 8050 diskettes to DOS 2.7 without an 8050 drive handy. It takes 2 tries to initially read an 8050 diskette on an 8250--try #1 fails; then, everything is OK until you insert another diskette. Also, 8050 relative files can only be read after you POKE in a configuration byte; then 8250 relative files can't be read until the byte is POKEd back again. The missing demo diskette supposedly contains a program to convert relative files. This inconvenience is offset by the ease of having ALL my important programs on a few diskettes, eliminating my need for a disk cataloging program; instead, I keep each type of program on its own diskette, in sorted order. Highly recommended.-JS

Printers and Supplies

CBM8300P PRINTER, $2000 from Commodore. Letter quality.

"Excellent. Can't say enough about it. It really eats up the film ribbons. But we're just so happy to have a letter-quality printer. No PET graphics, so listings do everything that WORD PRO 4 outputs. You need tractor feed to prevent skewing of long text. For math and science people, it also does exponents and subscripts. Recommended."-William L. Hinrichs

PROWRITER PRINTER, by C.ITOH; about $800 from Leading Edge dealers.

Written up in Creative Computing's Buyers Guide as 'The nearly perfect printer. 120 cps. 9x9 dot matrix printer. Has program-selectable pica, elite, proportional and compressed type. Also includes incremental or logic seeking print modes, bold face and expanded print and a true underline. Standard ASCII printer; can select U.S., graphic (not CBM), Greek and Japanese character sets. Built-in rear tractors provide forward and backward paper feed or friction feed at the flip of a lever. Clean, low profile design with Select/Deselect, single line feed and top-of-form buttons on front face. All dip switches for interfacing are inside front lift-off cover for easy setup or changing defaults. Head snaps out for easy cleaning. Handles up to 4 copies and accepts pop-envelopes well. 10 1/2 inch feed with up to 132 print columns available in compressed mode. Requires interface for IEEE, but IEEE version is in the works. Completely dot addressable graphics to design your own forms.

Well written manual provides most information needed, including routine preventative maintenance, and in-depth details of RS-232 protocol. Has full year warrantee with wide U.S. service support. This correspondence quality printer is the best thing that ever happened for anyone wanting great quality printing plus dot matrix speed and flexibility. A better all round printer would be hard to find, particularly for the price. Highly recommended for serious users.-JK

MICRO-PERF or DATA-PERF PAPER, $25 + at various office supply outlets.

The ideal paper to solve the single sheet feeding problem with tractor only printers. Comes with tractor tearoff so fine that it looks like a cut sheet with perforations removed. Expensive (above price is for 1100 sheets), but really looks like cut bond paper. Available some places with letterhead. Well worth the price for finished output.-JK

Upgrade Modules

40/80 BOARD FOR FAT 40s, from Execom.

Software selects between 40 and 80 columns on 12" screen 4016s and 4032s. In 40 column mode, preserves huge characters, rather than using middle 40 columns of 80 column mode. Works well, and the beta-test customer whose copy I saw is quite happy. Since installation would be quite a job, leave it to Execom. They do such work well.-JS

SOCK IT TO ME BOARD, $25 from Skyles Electric Works.

"A board that plugs in UD11 and UD12 on the 8032, with an external switch to switch ROMs in their respective locations. On my 8032, the 64K expansion board would not work until I removed this little board. I can only assume this board is not compatible in all 8032's. [Do] all switchable ROM boards cause the same problem?"-WZ [See discussion under Reader's Questions and Comments.-ED]

Interfaces

I-I CABLE, from Warren Radio.

Fran Donovan, another CIPUG member and good-guy CBM dealer offers IEEE to IEEE cables in almost any length, up to 16 meters. These are well-made shielded Belden cables with molded-on connectors. I'm using the 4 meter (13') one to link my PET and CBM systems across the room. Prices vary, depending on whether you're a dealer or user, but are quite reasonable compared to others I've seen for long IEEE cables. Highly recommended.-JS

Networking Equipment

THE ARBITER, $150/machine from Batteries Included. Local network.

"This multi-machine link outperforms the MUPPET hands down. We have used both systems in demonstrations this year and find the MUPPET still hangs up the bus should one machine hang up. As an example of [its] ruggedness, we've used the system since June in a hi-tech exhibition at CNE and Ontario Place. Thousands of kids have yet to hang up a single program! Commodore Canada has been making interested noises...."-John Easton

MUPPET 1, $750 from CMD. Local network.

Links 3 PET or CBM computers to the same IEEE devices. Maximum of 8, connected via 6' daisy-chained cables (longer cables optional). Plugs into IEEE port. No software. Works with all known CBM/PET models and program packages. Protrudes 4 inches behind computer. Works well, and is expandable into MUPPET 2 system later. Perhaps a bit overpriced in relation to PETscan below.-JS

MUPPET 2, $995 from CMD. Local network.

Adds 32K controller computer to MUPPET 1; polls up to 16 "muppetted" computers, forcing them to take turns using IEEE devices. Is programmable; can be set to ignore dangerous commands from some or all computers. Also manages background printing of printer files from disk, and can even erase such files afterwards. Includes RS-232 and parallel ports; said to be directly programmable from a SuperPET via the RS232 channel. Works well, with many features for its cost. Recommended if you need to keep a printer from tying up the IEEE bus or to lock out dangerous disk commands. Definitely a first-rate product.-JS

PETSCAN, $250 from A.B. Computers. Local network.

Very much like MUPPET 1, but lacks a case. Includes "busy" light to show which computer is currently using the bus. Stands vertically along the computer case's back, protruding less than an inch, and is low enough not to interfere with an opened computer hood. However, it will contact the grounding post on current models, and likely fry itself, unless you remove the post or protect the board with silicone glue or a case. It comes with little clear plastic strips that may be for this purpose, but since it comes utterly without instructions, we aren't sure. We use this model at Lincoln College, since our budget is limited, we do little printing in class, and our students are mature enough to leave dangerous disk commands alone. It works very well for us. Recommended.-JS

Other Equipment

OMNI TV/MONITOR, Model CT-1112, $459 from Panasonic.
Both a pushbutton color TV with 14 channel capacity, and direct connect monitor for VIC or 64. See review under 64 Hardware Reviews: Other Equipment.

HUH ELECTRONICS BEEPER, from HUH.
"The idea is an excellent little board that fits between the cassette connector and the main circuit board and gives a beep as the tape starts and stops. There is only one minor(?) problem. An integrated circuit drives the speaker with a series of sharp pulses. The other end of the speaker is connected directly to the +5V line which drives the RAMs, possibly damaging one or more RAMs with the sharp spikes. Although the inductance of the speaker coil is low, a pulse with a sharp wave front...can generate a very high voltage spike when it cuts off. If you remove the HUH Beeper, you will probably discover your loading problems will diminish, if they do not disappear entirely."-Norman Girard

COMPUTER LANGUAGE REVIEWS

VANILLA PILOT, $30 from Tamarack Software. For 8032. Also planned for 64.
Machine-language version of the Pilot teaching language, by Dr. Daley. Test copy is for 80 column models. Includes BASIC AID commands, immediate mode commands of BASIC, and quarter-dot Turtle graphics, in addition to Pilot's own. Also has CLOAD (from cassette), CSAVE, LLIST (formatted list), PLIST(on printer), RUN "name" (load or append & then run disk file), and UNNEW. Uses CB2 sound. The Pilot portion has commands much like JOH's TINY PILOT for PET, but doesn't need quotes at the start of each line. Test version was pre-release, with a simple manual, but so far it looks very good, especially the demo, which printed the word Pilot upside-down, sideways, and diagonally. It will be interesting to compare it to Commodore's own Pilot for the 64 next time.-JS

VIC FORTH, from HES.
See under Vic Language Reviews.

MAGAZINE REVIEWS

PERSONAL COMPUTING, $18/year from Hayden. Monthly.
Slick magazine with slick writing. Interviewed editor of POWER/PLAY magazine briefly. Commodore largely ignored in favor of IBM's PC and some Apple stuff. Beginner and business oriented. One program documented, but not listed. A waste of time if Commodore information is what you want.-JS

SuperPET GAZETTE, Bimonthly, $10/year from the SuperPET Users Group.
Sample issue free on request. The September issue, (#2), is a 10 page stapled newsletter, well-printed, and folded to fit a #10 envelope. It includes information on CHR$() codes on the 6809 side, immediate-mode procedures, a dump utility, and how to get COBOL and other updates. ($30 from Commodore.) Definitely users helping users. Helpful in understanding a powerful tool no one else supports, and at a fair price. Recommended.-JS

infoWAT, $10 for 10 issues from WATCOM.
Sample issue free on request. September issue (#3) 4 pages, well printed, discusses printing and listing from SuperPET languages. Recommended.-JS

Coming Up:

COMMANDER, $22/year, reportedly monthly. From Micro Systems Specialties.

A new Commodore journal, to be named COMMANDER, is coming out this month, according to a letter I and several others received. Arthur Cochrane wrote back and got a reply, but they ignored my October 4 letter, and another I sent 3 weeks later, despite my including a stamped reply envelope. They did contact JO once. He reports one reader has heard of the company, says they've been around a while, and are trying this as a new venture. If the company is reputable and knowledgeable about Commodore, we wish them well, but do wonder why they haven't given the courtesy of a reply. There's certainly room for another U.S. PET magazine.-JS

MODEM REVIEWS

Hardware Packages

UDS 212LP MODEM, by Universal Data Systems. $450 from Leading Edge dealers.

1200-baud-only RS232 modem, using the recommended 212-type protocols. A very simple direct connect model. Sits under a standard phone and is only an inch high. Has only two controls: an OFF/ON switch with a power on light on the front, and an ORIGINATE/ANSWER switch on the back. Connects to PET via a MCTERM or COMMUNICATOR cable. Nothing else we've seen can keep up with it. Works well. A good choice if you already own a 300 baud modem, and don't want to spring for the Hayes 300/1200 baud SMARTMODEM ($250 more.)-JS

Software Packages

THE COMMUNICATOR, $200 from Amplify, Inc. For all 80 column models.

Uses a ROM at either socket. Board plugs into 6502 socket. The best TERMINAL PACKAGE I've seen yet! Allows PET to reliably emulate any of three popular terminals, at up to 4800 baud. I've seen an 8032 become both a terminal on another microcomputer, such as a CP/M system, without visibly slowing that system, and also a simple 1200 baud modem hookup.

ALSO serves as A TRANSPARENT INTELLIGENT INTERFACE TO A MAINFRAME COMPUTER. Comes with PL/1 source listing to allow host computer to service one or more PETs easily and powerfully. Host can act like disk drive to store and load programs, transfer messages between fellow users of the host program, and give full access to the large computer's resources. Simultaneously, at the PET end, you can jump between terminal mode and BASIC without losing data from either mode. While in BASIC, you can also alter the terminal mode's translation tables to allow special characters, such as graphics. Also has 40+ character log-on buffer. Use it to answer questions asked by the host at sign-on, with a single key.

DISADVANTAGES? Has no option to load and save files from Punter PBBS bulletin boards. Needs some setup to handle half duplex. Highly recommended!-JS

XPTERMand XPTERM 103, $40 from TNW Corporation.

We have received these smart terminal programs and will review them next time, after Lincoln College is able to install an outside phone line to our building. We hope to set up a bulletin board there.-JS

UTILITY REVIEWS:

Programmer's Aids

MASTER, $300 from CMD. For CBM 8032 or 8096 with CBM disk.

Protected by dongle on Cassette port 1. No warranty. The ULTIMATE PROGRAMMER'S AID! When you consider that CBM BASIC has about a hundred keywords in all, and that this package adds another eighty+ of its own, you begin to see its power. This package does for the 8032/8096 much of what COBOL does for the SuperPET, and makes writing a customized database manager package a snap.

MAIN FEATURES: total control over what appears where on both the screen AND the printer (full forms control, not mere PRINTUSING); full control over screen data input, with validation; ISAM disk file management; disk data packing and unpacking; character search; 22 digit precision math; computed GOSUB and GOTO; full use of the 64K add-on memory as a "cache" memory for up to 16 programs and subroutines (runtime merging and chaining with common variables); the usual TOOLKIT functions; screendump; quarter-dot plot; beep; no-list and no-stop.

NEGATIVES? Some commands are redundant (like BASIC itself), and its random file structure could be destroyed by a thoughtless COLLECT command.

Includes awesome demos. Finally makes the 8096 add-on memory truly usable, with 40K free in BASIC for programs, and another 25K free for variables, without modifying standard BASIC tokens as OS-96 does. Best of all, has no fee for using its run-time portion in your own commercial programs. If you have used PROC EP from our HELP diskette, you have some idea of what MASTER can do. Highly recommended.-JS

INTELLIGENT SOFTWARE FOR COMMODORE COMPUTERS

At last, an affordable electronic spreadsheet. **Copycalc** turns your video screen into a window on a matrix of numbers. Cursor around the matrix, enter numbers; the totals reflect the changes. You can save the matrix to disk or tape, or print it on your printer. For $20 ($15 with another program), this program can justify the cost of your Commodore. Requires 6k; version available for standard VIC.

Word Processor Plus was not designed to demonstrate what computers are capable of doing, to be an expensive toy, or to instill awe or fear or even admiration into its user; W/P+ was designed solely to facilitate correspondence, for a wide range of personal and business uses, quickly and easily, with a minimum of training and frustration on the part of its user, and at the least possible cost, both in hardware and software. The most thoroughly tested, useable word processor available at anywhere near the price, for all the Commodore computers (R8-232C version available for VIC and 64); $30 (10k RAM, printer req'd.). Upgrades for old W/P copies (below V4.0) $15.

Prices include documentation and shipping; Calif. residents add 6%. Please specify hardware configuration when ordering. Other programs available (sorry, no games).

William Robbins, Box 3745, San Rafael, CA 94912

SOPHISTICATED TELE-COMMUNICATION IS HERE

THE COMMUNICATOR

for 4.0 Commodore Computers

With: HIGHER SPEED
MORE SOPHISTICATED CONTROL
LOWER PRICE

THE HARDWARE — A printed circuit board; easily installed in the CBM. It uses no CBM connectors; gives a serial port with true RS232C standard. The board alone is capable of running up to 9600 baud. With the software it will run up to 4800 baud.

THE SOFTWARE —

- Emulates the ADDS Regent 100, ADM 31 and/or the TeleVideo 950.[1] Or choose the VT100 model for use with DEC and VAX computers.
- Runs coresident with BASIC programs; lets BASIC programs and program on host computer communicate to develop really sophisticated communication and control capabilities.
- The program is on ROM at either address; no disk loading required. Uses only 512 bytes of RAM; will relocate itself around any other machine language program at top of memory.
- Will upload and download and run BASIC programs. With BASIC program will upload and download standard data files. 100 page manual gives program listing for BASIC programs.

Excellent text editor designed to work with THE COMMUNICATOR

THE COMMUNICATOR	$200	THE COMMUNICATOR and	
Text Editor	$ 40	U.D.S. 1200 baud modem	$625
U.D.S. 1200 baud	$450	THE COMMUNICATOR and Hayes	
Hayes 300/1200 baud	$595	300/1200 baud modem	$770

We sell U.D.S. and Hayes 300 baud modems at excellent prices

AMPLIFY, INC.

2325 Macbride, Iowa City, Iowa 52240 319-337-8378

[1]trademarks Adds Regent, Inc., Lear Siegler, Inc., Televideo Systems, Inc.

COMMODORE 64 REVIEWS

64 BUSINESS REVIEWS

Mail Lists

MAIL MATE, by Michael Schaff, $50 from Commodore. Requires 1541 disk and VIC printer. Labels are 1 or 2-up, 2X4" in size. Capacity 800 names. Relative file manager with preset mailing format. In BASIC, so may be modified for special needs. It uses a machine-language Input Editor, usable in your own programs. Advanced features include: sorting by any field, pattern-matching on searches, use of both upper and lower case, and a status/message line. MAIL MATE is simple to use, with a built-in HELP screen and about 20 pages of printed instructions. It adheres to Commodore's software standards as well as any program I've seen. My only complaint is that the manual tells you not to change record numbers, but the program allows you to anyway. Recommended.-JS

THE NAME MACHINE, by Michael Richter, from Commodore. BASIC. Diskette sold with WORD MACHINE word processor for $30. Also works on cassette.

Capacity: 150 names. Offers choice of border, background and character color, a nice touch if you don't like cyan-on-blue at power up. Has options to save data files on tape or diskette. Relatively easy to use. Input is somewhat slow since you're sent back to main menu after each name is entered. Could be speeded up if program was set up to execute when you hit the proper command without pressing RETURN each time. Links with WORD MACHINE files to print addressed form letters. Classifies entries into 8 categories; you can print selectively by each category or the entire file. Offers 1 or 2-up labels. Sorts on first name, last name, city, state and zip or telephone number. Warning: if you exit the program from the main menu as presently shown, you wipe out the program. This is a handy program for a small name list.-LW

Midnite Software Gazette
Attention: Jim Oldfield
635 Maple St.
Mt. Zion, IL. 62549 USA
217/864-5320

Word Processors

EASY SCRIPT, by Precision Software, Inc, $100 from Commodore.

A fairly powerful 64 word processor. Features horizontal scrolling full-time, splitting words at the limits. Doesn't show characters ahead of the cursor as it scrolled, and allowed wrap-around when scrolling left, making it very frustrating to use. Rarely will you begin a line without wondering what is at the end of the prior line. Features appear to be about on a par with WORD PRO II, and below WORD PRO III. Since the review copy is preliminary, the scrolling problem may be fixed before sales begin. As is, it's better than WORD MACHINE and other all-BASIC word processors, but far inferior to RTC-4.-JS

RTC-4, from Richvale Telecommunications. Requires CBM disk; cassette version planned. Special combination Canadian prices ($60 with V-LINK, $15 each with $1,000 school license or $5,000 school board license). Manual separate, $20.

This is the best of the new batch of '64' word processors. I used it to write this review. It is a screen-oriented machine-language program. Holds 40 screens in memory at a time, each handled separately, but linked at print time. A document may have as many screens as the diskette will hold. Editing within any one screen is much like in BASIC. Function keys scroll between screens, redefine keys, handle French characters, dump current screens and load new ones from disk, select a disk drive to use, and so on.

Naturally, text and background colors are user selectable. Supports a half-dozen printers and all CBM disk drives via C64-LINK interface (see separate review). Program includes dictionary command to check spelling. Vocabulary is initially small, but program adds words quickly on request, using a separate diskette to hold word list. The manual is very readable, and easy to flip through for quick reference later. A sample disk is available on request.

Has video output mode, including horizontal scrolling to see the whole "page" in wide printouts. One special option, a structured output that forces spaces, is used with RTC's mail list program on the 8032 to send very flexible form letters to very large lists. Each screen can be a separate paragraph so that users may select which paragraphs to send to which names. Of the currently available word processors for the 64, I highly recommend RTC-4.-JS

THE WORD MACHINE, by Michael Richter, from Commodore. Diskette sold with NAME MACHINE mail list for $30. Also works on cassette.

Offers same choice of colors, and contains all common word processing features, except "block delete" and "block move." Includes "global search and replace." In edit mode, you have full cursor control within what appears to be 5 line blocks. Asks how far into document you want to edit (by %) when you choose edit mode from the main menu. Press RETURN to move to successive blocks. Editor inserts or deletes character under the cursor, rather than character to the left of the cursor that standard text editors change. Has 3 general print formats: formal, informal, and draft. Names are unrelated to what you get, but are explained well. You control single or double spaced lines, number of spaces per line, number of lines per page, and tab length. Will run with tape and/or diskette and will link with a NAME MACHINE file for form letter work. All in all, this should handle any normal corresponence quite well (but not footnotes).-LW

WORD PROCESSOR, Version 5.18, $30 from William Robbins.

LW reviewed the VIC version very favorably for us last time. He has since traded up to a 64, and now reports that Bill Robbins provided an upgraded version for the 64, with some added features. However, it took some work by LW to get the new version to work with his VIC printer. (See his article in this issue about needed POKEs.) He also reports the new spooling feature doesn't work.-JS

64 EDUCATION REVIEWS

Two programs are already out from Commodore, called EASY LESSON and EASY QUIZ. They sell together, for $40. They are quite friendly, flexible and appear to be a good value. After trying them out on Jim's students we'll have more to say next time.-ES

64 GAME REVIEWS

GREENHOUSE, from Commodore. For 64. Requires joystick.

How wonderful it is that the first machine-language game for the 64 is wholesome! In 5 years of using PET programs, this is only the 4th game I've used whose object is entirely helpful, and this one is much more fun to play than the others. (BABY, TREES, and our own adaptation, EATER.)

Object is to water flowers, cut down weeds, and if you get far enough, chase away birds. This involves climbing a ladder, opening and shutting spigots, descending the ladder, and wielding a hoe - all to be done very rapidly, via joystick. The graphics are excellent, making full use of sprites. The farmer nods if you win, and shakes her head if you lose. Naturally, there's a nice little tune as she walks. Look for it soon at your dealer's. Highly recommended!-JS

MONOPOLE, $10 from its true author, John O'Hare (41-132nd. St., Lemont IL 60439), or reportedly $25 from American Peripherals (listing other "authors".) For 64. Public Domain. Nearly identical version for PET/CBM in ATUG library.

An excellent adaptation of the Monopoly board game for 2 players. Rolls the dice graphically on the screen. Realistically displays board, and players' moves. Includes all the extras--buying, selling, trading, mortgaging, auctioning, jackpots and so on. Naturally it has sound, and excellent color (the only thing visibly added by those newly claiming copyright.) This game has been popular on the PET, and should be even more popular on the 64. Our 6 year old son, Jamie, taught himself to play the board game after trying this version a few times; now he's a formidable opponent! Highly recommended, as long as you get it from JOH. See discussion under Copyright Notes.-JS

64 HARDWARE REVIEWS

Cassette and Disk Drives

VIC 1541 SINGLE DISK DRIVE, $395 from Commodore. 170K byte floppy disk drive. For VIC & 64 models.

Theoretically read/write compatible with CBM 4040 & 2031 drives, it accepts their diskettes grudgingly. Things go a bit better if the diskette is first formatted on the 1541. Identical to the former 1540 disk, except for a slight ROM change to work with the 64. Cute and small, a good match for the VIC & 64. Includes a power-on light. The unusual drive door latch takes practice to use well, especially when "tickling" (centering) the diskette.

Came with a demo disk, but no manual. Commands are the same as on other CBM disks. As drives go, the 1541 is uninspiring, but cheap. It's worth the extra investment, compared to a cassette drive, and also quite portable. I prefer the 8096+8250 at home, but when I travel, I take the 64+1541. Recommended.-JS

Printers

VIC 1525 PRINTER, $395 from Commodore. Pin-feed dot matrix printer. For VIC and 64.

REVIEW #1: Upgraded former model 1515--a bit larger, but much quieter and better looking. Also handles normal 9.5"x11" computer paper now, as long as paper lays directly behind printer and not below it. Print quality is surprisingly good, but proceeds at a slow 30 cps. Lacks formatted print of most CBM printers (no loss), but adds a nice graphic bit mapping option. Prints all Commodore characters. May not work properly with the C64 unless the 64's screen is POKEd off while printing data, though I had no problem with that during testing. A ROM change to fix this is rumoured. Construction is lightweight, to say the least, but still a good printer for the price. Recommended-JS

REVIEW #2: This printer is a joke. It will not draw the paper as far as 36" from the floor without jamming up. When using this printer, I had to feed the paper by hand.-FD

Interfaces

C-64 LINK, about $190 from Richvale Telecommunications. IEEE, RS-232, SERIAL, PARALLEL adapter with BASIC 4. For any 64; similar unit available for VIC.

REVIEW #1: IEEE-488 interface and much more. This is an amazing little plug. Easily 10 times smaller than a competing unit from Arizona, and 3 times smaller than one from Texas, yet does far more than either. Includes: BASIC 4, ROM monitor, safe multi-user IEEE access by linked 64s, and a modem control program. For another $50 each, add an RS232 or Centronics parallel cable, already controlled by the LINK. This is the only IEEE interface that lets you hold your 64 in your lap while typing. It also improves BASIC 4; for instance, it allows direct DLOADs from names within the DIRECTORY, and accesses monitor by typing MONITOR. Requires 8K of memory at $8000, but includes 2 relocators that move it into out-of-the-way places if desired. To preserve bus access, just type SERIAL to use serial bus, and IEEE to use IEEE-488 bus. RTC's Peter Smith reports it's been tested successfully with the forthcoming 64 CP/M cartridge.

Instruction manual is simple, but adequate if you already know BASIC 4. Although $50 is a bit stiff for the optional 6' parallel and serial cables, they're well done, and simply plug in to the user port. The RS2332 supports 6

wires.

Limitations are trivial for such a fine product: 1) Since it doesn't extend the 64 cartridge bus, you must unplug it to use other cartridges. 2) Does slow BASIC a bit, but no more than the DOS Wedge you'd be using instead. 3) You can't use both a serial disk drive and an IEEE printer at the same time. Overall, C-64 LINK is vastly more than an IEEE interface, and WELL worth its price. I can't imagine using the 64 without it. Highly recommended.-JS

REVIEW #2: The perfect companion for the 64. Unit plugs into cartridge port and provides Basic 4 at power up. Can select all four output types from program or direct mode to allow changing of device types. Unlike many other interface devices, has no switches to set. Excellent disk handling.

When tested with 4040, 4022 and Prowriter printer, my preliminary version handled well with a few minor glitches. Peter Smith stated that owners with serial numbers lower than 5 should return their LINK for a free update. Also, syntax error showed up on SPC and TAB on output (PRINT#) functions, but worked OK on screen outputs (a bug in the 64). Otherwise, it worked VERY well, although serial and RS-232 functions were not tested. It would be hard to image anyone using a 64 without this device. Highly recommended, from a responsible company.-JK

CIE CARTRIDGE, $80 from Micro-Systems. IEEE-488 interface for 64. See review of its identical cousin, VIE cartridge for VIC, under VIC Hardware Reviews.

IEEE INTERFACE, $100 from ComputerWorks. For VIC, with 64 version coming.

See the interesting discussion of this company under Dealer Notes and the review of the VIC version under VIC Hardware Reviews.

I haven't seen this working, but I did see a box of them recently at Computer Country in St. Louis. It's a large gray plastic box that sits on the table behind a VIC and plugs into its cartridge slot. It includes a pass-through of the slot on the back, and a parallel IEEE connector on the side. It also includes a reset button. The box was ordered as 64 IEEE interfaces, but the company told Computer Country. they forgot to include a connector needed to work on the 64.

Whether it works or not, I'm not interested. It's far too large and ugly to be part of a 64 or VIC system, and adding a further adapter for the 64 will make it even clumsier. Get RTC's C64-Link or Micro-Systems' VIE instead.-JS

Other Equipment

OMNI TV/MONITOR, Model CT-1112, $459 list price from Panasonic.

A pushbutton color TV with 14 channel capacity, and direct connect monitor for Vic or 64. Connection is via 5 pin DIN to quad RCA phono plug cable, not included. 120v. only. 11" (diagonal) screen. Removable antenna. Selects between 2 monitor inputs. Includes AFT and ECS tuning aids. Excellent 2 year parts and labor carry-in warranty. Very compact--only 3" deeper than my 9" RCA B&W set. This TV works very well with my 64. No interference problems at all; all colors are clear, bright and accurate. Good sound, despite tiny speaker. Even the case is attractive. Highly recommended.-JS

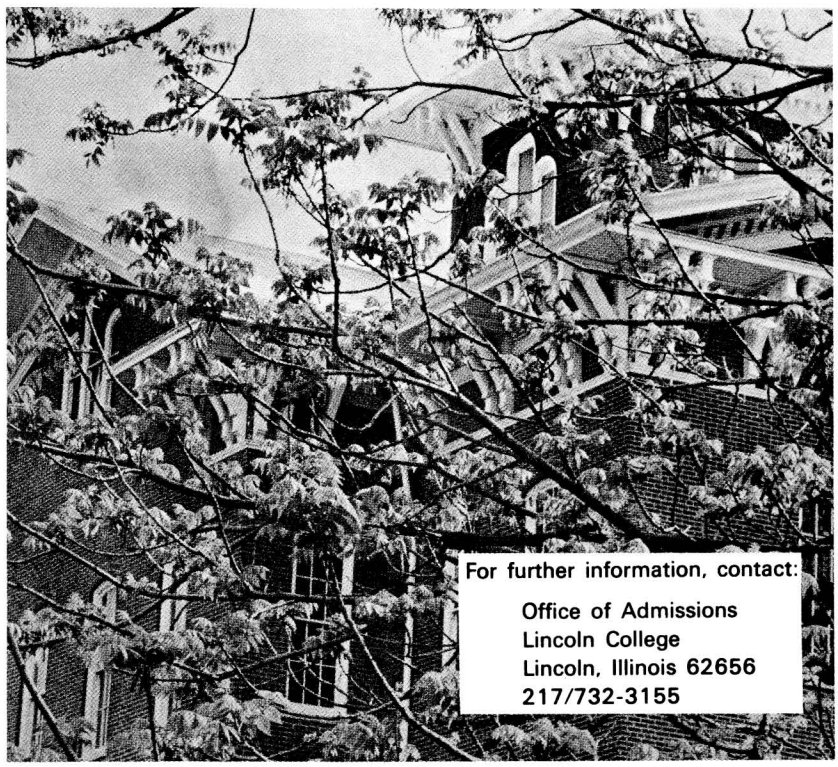
64 LANGUAGE REVIEWS

VANILLA PILOT, $30 from Tamarack Software. For 8032. Coming for 64.
Machine-language version of the Pilot teaching language, by Dr. Daley. See under Language Reviews.

64 UTILITY REVIEWS

PET EMULATOR, $30 from Commodore.
This simple-to-use program allows the 64 to run most programs written in BASIC for PET models, without changing such BASIC commands as PEEK, POKE, and WAIT. For example, it easily runs Michael Richter's PAPERMATE word processor on the 64 after you delete line 117! It copes easily with zero-page PEEKs, screen POKEs and CB2 sound programs. It also includes DOS Wedge 5.1, to vastly ease disk handling in BASIC 2. Naturally, it still doesn't handle complicated machine language programs that use SYS calls into the BASIC ROMs. A must for those with access to existing Commodore software.-ES

Lincoln College



• **Academic Programs**
Agri-Business
American Studies
Art
Biology
Business Administration
Chemistry/Physics
Commercial Art
Criminal Justice
Education
English/Literature
Environmental Science
History/Political Science
Human Services
Law Enforcement
Mathematics and Computer Science
Media/Journalism
Music
Philosophy/Religion
PE/Recreation
Psychology
Sociology
Speech
Theatre

SUMMER COMPUTER SEMINAR JUNE 19-26 1983

• **Extracurricular Programs**
ATHLETICS
MEN
Baseball
Basketball
Soccer
Swimming
Tennis
Wrestling
WOMEN
Basketball
Softball
Swimming
Tennis
Volleyball

FINE ARTS
Broadcasting
Creative Writing
Dance
Music-Instrumental
Music-vocal
Photography
Speech
Technical Theatre
Theatre
Visual Arts

• adult education • radio station WLNX-FM • off-campus studies in Florida, Rockies, Europe • commuter scholarships • 13-1 Student-Faculty ratio •

VIC REVIEWS

VIC GAME REVIEWS

Cassette:

AIR STRIKE, $11 cassette from D.E.S.
REVIEW #1: Bomb a moving tank from your plane above. Screen shows only your plane and the tank. Unexciting game, but bombs do drop true to life.-JO
REVIEW 2#: You get 10 passes to destroy a moving tank. Only control you have over the game is to hit SPACE to drop a bomb. Good graphics and sound, but a bit too simple for most.-JOH

ALIEN SOCCER, $15 caseette from MIS. Joystick, keyboard or paddles.
More of a horizontal pinball game than a soccer game. You are a goalie trying to prevent aliens from getting a shot past you. Good game, written in machine language. Recommended.-JOH

ANTI-MATTER SPLATTER, $13 cassette from Nufekop. Joystick.
You must protect little men at the bottom from falling barrels of anti-matter. At the top of the screen, an alien drops anti-matter while protected by moving energy bands. Graphics and sound are good, but is a bit boring.-JOH

BANK ROBBERS, $13 cassette from Wunderware. Joystick.
REVIEW #1: Two friends at the top of a bank throw money down at you, which you must catch in your drifting basket, and dump into your car trunk. When police arrive, you lose. I really enjoyed it. Good idea, with funny ending. Recommended.-JOH
REVIEW #2: Catch randomly thrown money from the street below and put into the trunk of your car. Very simple graphics. Not recommended.-JO

THE BLACK CASTLE, $20 cassette from DES. Requires 3K or more expander.
Text adventure/quest type game. You travel through forests, caves,castles, etc., fighting demons and other monsters in your quest for three.-JOH

BOMBS AWAY NOW, $20 cassette from Protecto Enterprises.
Similar to JOH's PAK BOMBER sold by HES but much slower. Catch bombs in your basket before they hit the ground. Not very exciting.-JO

BUG BLASTER, $20 cassette from Protecto Enterprises.
Another CENTIPEDE game. There are better versions. Not recommended.-JO

THE CRICKETT, $25 cassette from Protecto Enterprises.
Similar to FROGGER of arcade fame. Excellent graphics, but play is too slow to enjoy.-JO

EXTERMINATOR, $17 cassette from Nufekop. Joystick.
Closest thing to CENTIPEDE I've seen. Has all the arcade's goodies, such as mushrooms, spiders, fleas and snails. Very fast moving machine language program. Recommended.-JOH

THE GRAVE CAVE, $25 cassette from Eathenross Software. Requires joystick and 3K expander. Protected.

Variant on DONKEY KONG theme. You must get one man to screen's top and jump to get money bag. Jump over hell hounds, cave bloobs, and devil without hitting your head on gravestones, trees or stalagmites before counter runs out. Written mostly in BASIC. A good game if you have a 3K expander, but don't buy one just for this game.-JOH

HOPPER, $2Ø cassette from D.E.S. Joystick.

REVIEW #1: You guessed it, a FROGGER type game. Plays slightly different than the 'real thing' but my kids love it. Uses HI-RES, color and sound. Well done program.-JO

REVIEW #2: You must get the frog safely to one of his homes at the top of the screen. Only real difference between HOPPER and FROGGER is that in hopper you must 'swim' between the logs instead of riding on them. Recommended.-JOH

MAD PAINTER, $13 cassette from Wunderware.

REVIEW #1: This is fun! Paint the maze before your brush is eaten. Well done screen colors and fair animation. Unlike other maze games I've played, I can't seem to get a pattern down. Recommended.-JO

REVIEW #2: Bristle bitters destroy your brush, while Invisible Stomper leaves footprints in the paint. Not a bad game; certainly worth the price.-JOH

MOTOCROSS, $15 cassette from Wunderware. Joystick.

REVIEW #1: You're looking down at a oval coarse. Object is to circle the course as quickly as you can avoiding stationary obstacles. Too slow.-JO

REVIEW #2: Has good graphics, but not too interesting.-JOH

PEDESTRIAN POLO, $14 cassette from D.E.S.

REVIEW #1: Besides lacking taste, it's badly written.-JO

REVIEW #2: Game in which you attempt to hit people, baby carriages and other neat [?] things with your car. I was disappointed in this game; the idea is so good [?], but the game turned out so bad. Needs more time spent on graphics plus a little machine language. Not recommended.-JOH

SKIING, $1Ø cassette from Wunderware. Joystick.

Good downhill skiing game. Must make a 1ØØ-4ØØ meter run downhill while avoiding a crashing. Still, I prefer from by HES (with more options).-JOH

SUPER PARATROOPER, $25 cassette from Protecto Enterprises.

Has the smoothest graphic animation of any 5K VIC program to date. Object is to shoot down helicopters and paratroopers falling from the sky with your ground gun. Even though it's one of my favorites, I don't allow my children to play, because troopers being chopped by helicopter blades and splattering to the ground is really no game. I wonder if the market can stand many more shoot 'em up games? Whatever happened to the good war simulations we used to play?-JO

3D-MAN, $13 cassette from Nufekop. Joystick. Requires 3K expander.

Pacman game which places you inside the maze with a 3D view of things. Idea is good, but game is a little too hard and also too slow.-JOH

TORTURE CHAMBER OF DOCTOR X, $5 cassette from Transonic Laboratories.

A simple game, using only standard graphic characters (though color and sound capabilities are well used). Requires joystick. Play is a little slow (it's in BASIC) but sufficiently challenging at level 2 (tough to beat) and 3 seems impossible. Not a bad buy for the price. Good game for kids, too.-Dave Strong

Cartridges:

ASTROBLITZ, $45 cartridge from Creative Software. Joystick.
A defender (horizontally scrolling screen with radar) type game. Enemies include flying saucers,land bases, space mines and heat seeking missiles. Very well done game, colorful, good sound effects, and even keeps the top 10 scores along with players initials. Recommended.-JOH

CLOUD BURST, $40 cartridge from UMI. For any VIC. Joystick required.
REVIEW #1: Another shoot-em-up, but best-done one I've seen yet on VIC! Paratroopers descend on you from passing helicopters, and capture you if you don't shoot first. Impossibly difficult until you learn how to get automatic repeat fire. Color, graphics, and sound are all state-of-the-art. Recommended.-JS
REVIEW #2: An unusual game in which aliens and bottles of acid fall from clouds drifting overhead. Acid bottles harmlessly disappear when they hit the ground, but aliens will follow you and must be destroyed before they touch you. Game seems a little expensive, but I found it quite enjoyable.-JOH

CLOWNS, $30 cartridge from Commodore. Requires Paddle controllers.
Another well known game variously called CIRCUS, CLOWNS and BALLOONS and ACROBAT. Object is to bounce little men off a little see-saw and up to the 'ceiling' where they pop three rows of colored balloons, each worth different points and bonuses. Very smooth graphics and excellent sound effects. Recommended.-JOH

COSMIC CRUNCHER, $30 cartridge from Commodore. Joystick.
Commodore's version of PACMAN with theme changed to space type setting. A little blue Commodore logo munches dots, Pursued by four killer satellites. You may 'dock' (eat) one of 5 space stations. Prizes are planets, stars, spacemen, black holes and other goodies. Has good sound effect, color and graphics. Much better than any other VIC PACMAN I've seen. Recommended.-JOH

GORF, $40 cartridge from Commodore. Joystick.
REVIEW #1: Second in Bally/Midway arcade series. Battle thru 4 different and unique screens of challenging space combat (arcade version had 5). These are Astro Battles, Laser Attack, Space Warp, and confrontation with the flag ship. Great sound effects. Graphics aren't as hi-res as others, but has super colorful screens instead. Highly Recommended.-JOH
REVIEW #2: Only lacks Galaxian Stage and talking voice of arcade version. Has some super sound effects and very good use of multi-color graphics. Very popular among my friends. Recommended for space arcade nuts like me!!-MN

MOBILE ATTACK, $30 cartridge from Micro Systems. Joystick.
Arcade type game similar to TARG or SPECTAR. You pilot a ship thru one of seven mazes while being pursued by enemy cruisers and launches, that attempt to ram your ship and destroy it. Good game, very close to arcade quality.-JOH

MOLE ATTACK, $30 cartridge from Commodore.
Game has nine 'mole holes' on the screen, out of which pop moles and bombs. You hit the moles on the head with a hammer, while avoiding hitting the bombs. Designed for children, but keyboard is too awkward, and joystick is too error-prone. Much better games are available.-JOH

OMEGA RACE, $40 cartridge from Commodore. Joystick/Paddle.
Commodore's first Bally/Midway game is a sure winner! Duplicates real arcade action better than most. Has great sound and super Hi-Res graphics.

Options allow for 1-2 players, joystick or paddle, and changing screen color. Definitely belongs in every collection. Hiighly Recommended.-JOH

OUTWORLD, $40 cartridge from UMI. Joystick.

Colorful arcade game; a cross between ASTEROIDS and MISSILE COMMAND. Protect your futuristic city from falling meteors and attacking UFO's, with limited energy to fight off the assault. Meteors break into smaller ones when hit. If a meteor gets too close, it will be deflected by automatic shields, but this will cost you energy. Shield is ineffective against UFO bombs. Every 10,000 points, a fuel ship re-fuels the city, if it doesn't collide with a meteor or UFO. A bit slow at first, but game is very well done, fun, and worth having.-JOH

RADAR RATRACE, $30 cartridge from Commodore. Joystick option.

REVIEW #1: Commodore's version of RALLY-X. Guide your mouse thru a maze and eat all the cheese. As usual, life is not simple: Mouse must clear maze before time runs out, while being pursued by 3 or more rats and roaming cats. Luckily, mouse aids include magic stars to slow rats and a radar screen showing mouse rat and cheese locations. Has large maze that scrolls thru a 'window' on the screen. A fun game kids enjoy and adults find challenging. Recommended.-JOH

REVIEW #2: Son Jamie loves to visit computer stores and play this. He'd call it...highly recommended.-JS

RAID ON FORT KNOX, $30 cartridge from Commodore.

One of Commodore's newest cartridges. Make trips thru a maze to steal gold bars and return them to your base. Black panthers patrol the maze, and a time limit starts after you pick up a bar. Idea is good, and graphics are smooth and fast, but game moves along too slowly to hold my interest. Best suited to younger gamers; older ones should get COSMIC CRUNCHER or RADAR RATRACE.-JOH

SARGON II, $40 cartridge from Commodore. Joystick optional.

One of the best chess programs for home computers. VIC version has excellent graphic representation of board and pieces, with levels to challenge just about anyone. Added features suggest your best move, position the screen, and change screen colors. If you enjoy chess, you need this cartridge.-JOH

SATELLITES & METEORITES, $50 cartridge from UMI. Joystick.

Asteroids game with many additional features. Pilot your ship around while blasting away meteors. Satellites try to prevent you from completing your mission, some crash into your ship, others shoot at you, and some just drift by. If this isn't enough, a 'black hole' appears and sucks in everthing on the screen, including you if you don't give full thrust in the opposite direction-JOH

SKY IS FALLING, $30 cartridge from Commodore. Requires game paddles.

'Chicken Little' has nothing to do with the game, but it's fairly good. Six rows of 'pieces of sky' fall from the top of the screen. Your job is to catch it. Gets progressively harder. Challenging enough for some adults.-JOH

Updates:

AGGRESSOR:

Our test panel of youth gave a lukewarm review to HES's AGGRESSOR last time, but now it's their favorite. Change the rating to "recommended".-JS

VIC HARDWARE REVIEWS

Cassette and Disk Drives

VIC 1541 SINGLE DISK DRIVE, $395 from Commodore. 170K byte floppy disk drive. For VIC and 64. See review under 64 Hardware Reviews.

Printers

VIC 1525 PRINTER, $395 from Commodore. Pin-feed dot matrix printer. For VIC and 64. See review under 64 Hardware Reviews.

Interfaces

IEEE INTERFACE, $100 from ComputerWorks, Phoenix, Arizona. For VIC, with version for the 64 promised.

[See the interesting discussion of this company under Dealer Notes and the comments under 64 Hardware Reviews.]

VIE CARTRIDGE, $80 from Micro-Systems. IEEE-488 interface for VIC, with CIE version for 64 also available.

A fairly compact flat box that lives behind the VIC, about halfway between the ComputerWorks box and the V-LINK in size. JO reports it works fine. Recommended for those unable to afford a V-LINK.-JS

V-LINK, $190 from Richvale Telecommunications.

(See the review of its sister product, the C-64 LINK, under CBM 64 Hardware Reviews: Interfaces.) I didn't test this VIC version, but it's out, and has been favorably reviewed by others. Its manual is brief, but adequate for those familiar with BASIC 4. It differs slightly from the 64 version: 1) It adds from 33-16K of RAM. 2) It apparently lacks automatic networking. 3) It allows most device combinations, via one of 5 optional cables, including SERIAL disk plus IEEE printer, but not IEEE device plus RS2332 device. 4) It sticks out from the VIC less than from the 64, but requires an optional cable on the user port to use its IEEE feature.-JS & JO

Other Equipment

OMNI TV/MONITOR, Model CT-1112, $459 from Panasonic.

Both a pushbutton color TV with 14 channel capacity, and a direct connect monitor for VIC or 64. See review under 64 Hardware Reviews.

VIC LANGUAGE REVIEWS

VIC FORTH, $60 from HES. CARTRIDGE only. Requires 5K.

REVIEW #1: An almost complete fig-FORTH for VIC 20. Works with 8K or 16K expanders, but not 3K expander. Has many non-standard FORTH words to handle VIC screen, color, and sound features, plus others to handle cassette drive. Line-oriented editor is difficult to use. Does allow some cursor movements, but not as powerful as VIC's BASIC screen editor. Poor manual, with very large, cramped type (most unusual from HES). Several words in FORTH dictionary weren't described. Scraps disk handling entirely. Handles SCREENs in non-standard way: you 're limited to screen numbers 1 to 8 on a 13K system. Lastly, there's no ASSEMBLER! It supposedly can be loaded, but doesn't say where to find one. (Dr. Dobb's, Sept. '81 issue has a 6502 ASSEMBLER!) Speed is not impressive...about as fast as BASIC in most of the benchmarks I've tried. Not recommended!-MN

REVIEW #2: FORTH, with its tiny size and high speed, is a good language for the bare-bones VIC. However, as Mark's review shows, the VIC itself lacks some desirable development tools, such as the normally required 64 column screen. I expect to see VIC FORTH used as a second computer language in schools with very low budgets, and more importantly, running serious FORTH applications developed on larger machines.-JS

VIC MAGAZINE REVIEWS

FOX 20, $43/year from Foxfire Systems. New cassette magazine for VIC.

PREVIEW #1: "The first issue will be...$5.25 per copy. It will have general news and gossip on one side and 5 programs on the other....that comes out to 75 cents per copy. The first issue includes a mailing list and a telephone utility (...while you make your long distance calls, you see a ontinuous monitoring of what the call is costing you...")-John Walker from 9/82's Hardcopy

REVIEW #1: Side 1 consists of 5 programs varying from games to utilities. Also varying quality. Equipment requirements vary, although most will run on unexpanded VIC. Side 2, FOXTALES, is an electronic newsletter consisting of FOX 20 information reviews, general information. Just what we have been looking for! Our subscription is on it's way.-T Gardner

REVIEW #2: A year of it is worth it. You get 5 program assortments of varying quality from great to OK. Has games for kids, programs for Dad, and lots for the whole family. Although some need expanders, most don't.-Gardner

VIC MONITOR REVIEWS

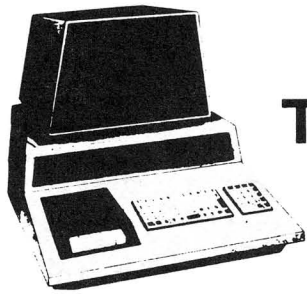
Updates:

HESMON, from HES:

It turns out VICMON isn't quite as good as I'd remembered. I'd thought it gave a simultaneous Hex and ASCII dump, as I have grown to love in MICROMON. It doesn't. This makes HESMON better by comparison than it had first appeared. Change our rating to "recommended", due to HESMON's additional features.-JS

ROM DETECTIVE 2.0, from Transonic Laboratories:

Written in machine language now (old version in BASIC). Documentation good, with samples of the commands. Good starter module for someone curious about what goes on in the VIC, but it's strictly a display program.-Dave Strong



THE PAPER ARTICLES

Feature Article:
Ralph's Column

Apple 2Ø TRS-8Ø 12 Commodore 6

by Ralph Bressler

Subscribers to The PAPER may have received issues 5 and 6 before 4. I take most of the blame, but the U.S. Postal Service also deserves mention. I took a third class permit, because it was cheap, but didn't realize how SLOW delivery could be. As recently as mid-October, I received address changes from August. Like so many other things in life, always go first class! Sending The Midnite/PAPER first class is much faster and more reliable. It also costs MUCH more. Speaking of cost, the final issue (number 4) of The PAPER cost just under $2/copy to print. You can imagine our staggering profits!

I know of only six publications in North America that regularly feature a good selection of information about the Commodore line. The other figures are made up, and may be too low. Why aren't there more newsletters and magazines for the PET? How can there be so many people writing about other machines? Part of the answer is that until lately, Commodore occupied a poor third place [in the U.S. market]. Second, PET never caught on as a hobbyist's machine. It DID catch on with schools, small businesses, and a few smart, dedicated hackers who saw its potential. School and business users rarely write for publication, due to lack of time, interest or knowledge. Now, as Commodore sells more home machines, new groups are aggressively touting "Commodore" publications. I don't know whether to sit back and watch or jump up and applaud. I wish I were convinced these new magazines were created to fill the "information gap", rather than make a fast dollar. Can the available authors and articles be spread over more publications without hurting the quality of all? I hope so.

It isn't easy [not even possible-ED] to cram all the notes, news, reviews and articles we have into 48 pages. Ellen and Jim deserve much credit for making the hard decisions about what goes and what stays. My philosophy in the articles section is to provide a little for everyone. This is hard, due to the kind of articles submitted and the variety of topics of interest. Readers like articles on simple and advanced BASIC, machine and assembly language and on hardware. People interested in software may want to see games, utilities or business programs, plus tips on using software such as VISICALC, JINSAM and WORDPRO. Commodore now makes a startling array of computers from VIC to SuperPET and 8Ø96, not to mention disk drives, printers and modems. When you include peripherals by others, the task becomes awesome. Unfortunately, what interests some, bores others. Don't sit back, lose interest or complain if we don't publish what you like. Write us a note or better yet, an article.

[NOTE: Those sending articles on diskette get it back with new exchangeable programs, as a tangible "thank you".-JS]

Feature Article:
BASIC

RUNES - A Cipher Generator for PET

by Lindsay Doyle

This program communicates selectively by leaving a cryptic message on the PET screen. It is a cipher whose symbols appear at first glance to be a complex and meaningless arabesque, such as might be created by a pattern generator. However, to anyone having the key, it is relatively easy to interpret at sight. It does not include a printout function, in lieu of any popular "screen dump" program. A good one is KEYPRINT by Charles Brannon, which appeared in issue 7 of Compute! for new ROMs and in issue 10 for old ROMs. Vol.IV, issue 3 of The PAPER contains a modified version for new ROMs or BASIC 4.0, and 40 or 80 columns, which relocates itself to the top of memory. The program, with the instructions removed, may also be incorporated in a games-master's armory for generating arcane spells, curses, and the like, the meaning of which must be puzzled out by the initiate.

Many readers may recognize our code as a simple modification of the "pigpen" cipher, said to have been used by Cardinal Wolsey, and also known as the Freemason's or the Rosicrucian cipher. It is first generated by applying the letters in alphabetical order to the configuration shown in fig. 1. The resulting arrangement is shown in fig. 2, from which we derive such symbols as are given in the sample message of fig. 3. All that is necessary to decode the message is to remember fig. 1. The rest can be worked out mentally "on the fly". This is the hand-written version: for posh, we add a few curlicues easily generated by PET. Each symbol can have up to four tails pointing in the four cardinal directions and arranged to connect with adjacent symbols. The dot which identifies the second half of the alphabet is replaced by what we call a "crow"; that is, one of the symbols shift-1, shift-2, shift-3, or shift-+, or, in the case of the "vee" characters J, K, L, M, and W, X, Y, Z, by a "spider", the shift-V. Finally, the SPACE character is given a special symbol. The previous sample message, thus transformed, is shown in fig. 4. Punctuation was originally included in the program in uncoded form, but just advertised that a hidden message existed in what otherwise seemed to be a semi-random pattern. Short messages seldom require punctuation. Some salient exceptions, such as "What are we having for dinner: mother?", only demonstrate that English is an imperfect language!

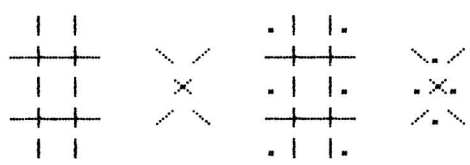


fig. 1

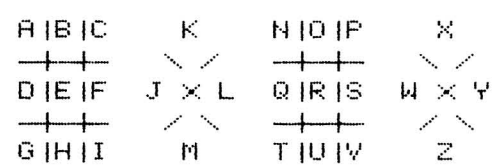


fig. 2

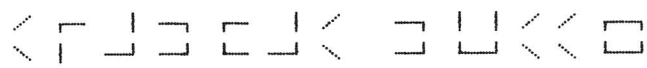


fig. 3

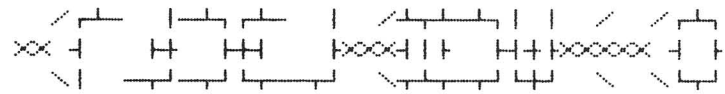


fig. 4

If the meaning of a message must be hidden even from those who are familiar with the technique, then many key-changes are possible, such as applying the alphabet to the base configuration vertically or from right to left. One such key-permutation, which is also easy to translate, is shown in fig. 5. The DATA lines have been arranged to make such transpositions easy to carry out by simply renumbering lines. Figure out ways to indicate to others which key is in use by encoding it at the beginning or the end of the message. Messages can be further hidden by being written from right to left or bottom to top, by prearrangement.

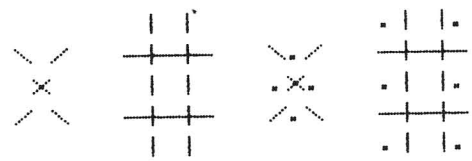


fig. 5

The original program included the actual PET graphic characters and cursor controls in the DATA lines. It is hard to find these on some keyboards and some require the shift key. For these reasons, the program has been changed to only require unshifted letters and symbols shown. An added subroutine at line 1000 translates the characters in DATA to the PET graphics characters and adds the proper cursor controls.

Please do not communicate with me or the editor in Runes! Only plain text messages will be answered. Anyone wanting to delve further into codes or ciphers should read The Code Breakers, by David Kahn (Wenderfeld & Nicolson,c1967).

```
100 REM: 7 RUNES BY L DOYLE  4/81
110 DIM AZ$(26):POKE59468,12:S$="(7right)"
120 :
130 REM: CHARACTER CODES CLEAR 3 BY 3
135 REM: SPACE: AZ$(0)=SPACE SYMBOL
140 FORI=0TO26:READAZ$(I):NEXT
150 DATA"1213]+212"
160 DATA"  ]  +2=","] ]3 +-2=","]  3  -2"
170 DATA"1.  +2=","01.3 +-2=","013  -2"
180 DATA"1.  +  ]","01.3 +] ]","013  ]  "
190 DATA"M   VVN  ","M N V  V "
200 DATA"  NVV   M"," V  V N M"
210 DATA"  ] +[2=","] ]32+-[=","]  [3 -2"
220 DATA"1. +[2=","01.32+-[=","01[3 -2"
230 DATA"1. +[  ]","0[.31+] ]","01[3 ]  "
240 DATA"M  VVVN  ","MVN V  V "
250 DATA"  NVVV  M"," V  V NVM"
255 GOSUB1000
260 :
270 REM INSTRUCTIONS
280 PRINT"(clr)***RRUNESr***(down)"
300 PRINT"THE PET WILL ENCODE YOUR KEYBOARD INPUT
310 PRINT"USE CURSOR LEFT AND OVERWRITE TO MAKE
320 PRINT"CORRECTIONS. USE CURSOR RIGHT TO LEAVE
330 PRINT"BLANKS. ONLY UPPER CASE AND SPACE ARE
340 PRINT"ENCODED. REMEMBER THE DIAGRAM AND YOU
350 PRINT"WILL BE ABLE TO TRANSLATE AT SIGHT.
410 PRINT"(2down)PRESS ANY KEY TO BEGIN. SHIFT Q TO QUIT"
420 :
430 GETSP$:IFSP$=""THEN430
440 FORI=1TO10:GETSP$:NEXT:PRINT"(clr)"
450 GETI$:IFI$=""THEN450
460 IFI$="(shiftQ)"THENPRINT"(2down)":END
470 IFI$="(space)"THENPRINTAZ$(0);:GOTO530
480 IFI$="(right)"THENPRINT"(3right)";:GOTO530
490 IFI$="(1left)"ANDC<>0THENPRINT"(3left)";:C=C-3:GOTO530
500 IFI$="(clr)"ORI$="(home)"THENPRINTI$;:C=0:GOTO450
505 IFASC(I$)>64ANDASC(I$)<91THEN520
510 PRINT"(down right rvs)?(off 2left down)";:GOTO450
520 PRINTAZ$(ASC(I$)-64);
530 C=C+3:IFC>=37THENPRINTCHR$(13)"(down)":C=0
540 GOTO450
550 :
1000 REM CONVERT SYMBOLS
1005 REM CONVERTS SYMBOLS IN DATA TO PET GRAPHICS
1010 REM AND ADDS CURSOR CONTROLS
1015 FORI=0TO26:T$=AZ$(I):AZ$(I)=""
1020 : FORJ=1TOLEN(T$)
1030 : L$=MID$(T$,J,1):IFL$=" "THEN1050
1040 : L$=CHR$(ASC(L$)+128)
1050 : AZ$(I)=AZ$(I)+L$
1060 : IFJ/3=INT(J/3)ANDJ<>LEN(T$)THENAZ$(I)=AZ$(I)+"(3left down)"
1070 : NEXT:AZ$(I)=AZ$(I)+"(2up)"
1080 NEXT
1090 RETURN
```

Feature Article:
64 Graphics

C-64 Sprite Generator

by Ralph Bressler

One of the most attractive features of the new Commodore 64 allows the programmer to control up to eight graphic characters of his own creation from a BASIC program. These sprites are made up of 24 by 21 pixels and are drawn on a separate screen in a different area of memory than the normal text screen. Each sprite is independent of the others; it can be a different color and moved about the screen or enlarged without affecting its fellows. If a background scene is drawn with the regular Commodore graphics characters, the sprites appear to move or "glide" over it without disturbing the scene. The movement of these characters is smooth, unlike the familiar jerky movement of most BASIC animations. As the sprites move about, certain registers in the video display chip change. These registers indicate if any sprites have collided with a background character or with another sprite. Each sprite also has a relative "priority" so that sprites may move in front or in back of each other. Based on this information, the programmer then decides what action his program will take.

This information can be used to create a marvelous graphics display with much less effort than on the earlier PETs, but can also be somewhat overwhelming. Commodore has supplied no vocabulary to create or animate these sprites. All of this must be accomplished by POKEs and PEEKs to various chip registers and other parts of memory. Several example programs and accompanying text in the 64 manual show a fairly clear method for doing this. First, you must create our sprite (easier said than done), represented by 24 pixels in the horizontal direction. Each pixel is a bit in a byte of memory and can be turned on or off. This means that each sprite is 3 bytes across by 21 down for a total of 63 bytes. To design the sprite, you must plan it out on graph paper. Simply fill in any of the boxes you want until you have a picture you want; then convert the diagram into those 63 bytes of data to be POKEd into memory. Sixty three binary to decimal conversions is a formidable task for even a dedicated and experienced programmer. You will surely want to change the sprite sometime, and a single mistake may be hard to find. This is the reason I developed SPRITEGEN.

SPRITEGEN was originally developed on a PET, since I have many programming aids and a disk drive to help me. The program will, therefore, work on the PET or the 64, but the 64 utilizes several functions not found on the PET. Unfortunately, since all work done on the 64 until now has been on a black and white TV as I await the arrival of my color set, watch for color control corrections in the next issue. The program helps you to easily design, edit and change sprites, and save them for later use as data statements or files. A creative programmer can thus spend more time creating and less time calculating. I have shortened the program as much as possible. For those of you that can wait, the program will be available on an ATUG program exchange diskette.

I have tried to develop the program in modules using subroutines so that the program flow is clear. Instructions were not included in the program to shorten the overall typing time. One version I have developed has a help section which can be accessed at any time to give a brief set of instructions. I hope the following REM statements and comments will explain things sufficiently to make the changes you desire. I would like very much to hear your comments on the usefulness of this program and suggested improvements. If enough show interest, I will write another article describing some techniques for moving the sprites and detecting collisions.

SPRITEGEN first asks if you are using a PET or 64 since some features are only available on the latter machine. When a 64 is being used, line 200 clears the screen to cyan and POKEs a "blank" sprite into memory. The screen is divided into two areas. On the right, a border defines the sprite creation area, which is 24 by 21 spaces to match the sprite configuration. On the left, a data/display area is used to display the data used to create the sprite. On the 64, this area is also displays the actual sprite image as it appears when used.

Notice the MODE designation in the upper left hand corner of the screen. This tells you what will happen to the sprite you are drawing as you move the "cursor". The MODE can be changed by pressing H repeatedly. PASS means that as the cursor moves, it will not affect the part of the sprite over which it is moving; for example, filled-in squares will stay filled in, while blank ones remain blank. CDRAW mode means that all squares the cursor moves over will be filled in or turned on. IDRAW stands for interrupted drawing. It is used when a series of single squares needs to be "turned on". When in this mode, the cursor will move much as in PASS; however, pressing space while in a square will reverse the status of that space (filled squares are blanked and blank squares are filled in). In ERASE mode, all squares will be left blank or turned off. To move the cursor, imagine yourself to be at H; the keys surrounding H will move the cursor in the customary directions. Pressing HOME will move the cursor to the upper left hand corner of the sprite creation area. Pressing CLR will simply clear both the sprite creation and data/display areas.

Eventually you'll want to use other program features. Pressing RETURN will cause the computer to translate the sprite into the 63 bytes that make it up. These decimal numbers will be displayed on the left of the screen and entered into an array in memory. If you accidentally erase a sprite, recover it by pressing SHIFT/RETURN. This function displays the bytes making up the sprite on the screen's left side and recreates the sprite on the right side. By pressing D, you may turn your sprite and its array of bytes into data statements, to be be saved and merged with another program. These lines may be displayed on the screen or printer. Seven lines of data will be printed, followed by line 150 and the word RUN. Line 150 controls the number of the first data line. Pressing SPACE at this point will continue the program, while pressing Q will end it. If you press Q, you may "capture" the data lines only by typing NEW and pressing RETURN. Then press HOME plus RETURN seven times. Clearing the screen and LISTing will produce the data lines ready to save as a program. Pressing RETURN again will update line 150 so that subsequent data lines will not overwrite previous ones. A RETURN will RUN the program so that you can continue creating sprites. To SAVE a sprite as a data file, press S and then give sprite's name when asked. Pressing RETURN alone at this point will abort this feature. The sprite may now be SAVEd on disk or tape by pressing D or T. LOADing a sprite proceeds similarly.

The 64 has one unique, final option. Pressing I will display two images of the sprite in the data/display area. The first image will be the unexpanded sprite as it would normally appear. The second image will be expanded in either the X or Y direction or both. You choose the expansion by your answers to the questions EXPAND X ? and EXPAND Y ? at the start of this section. When finished, press SPACE to return to the main part of the program.

Some may wish to change the program. The variable ES represents what was in a space before the cursor got there. This is most important in the PASS option so that what was there will be replaced when the sprite leaves. Lines 1020-1030 allow the cursor to flash. Line 1020 sets the ES value and a flag (PF) to prevent ES from being constantly, improperly reset. Line 1030 flashes the cursor between its original and reversed states. FF, which records the number of the MODE you are in, varies from 0 to 3. For instance, when FF is 0, the mode is PASS. Lines 1270-1300 show how FF affects what will be left behind as the cursor moves. Lines 2000-2170 control the sprite image display on the 64. Lines 2030-2080 lets the user determine the expansion he wants. Line 2090 POKEs that

data from the sprite array into the 13th memory block. Line 2100 initializes the X and Y expansion to 0 and sets the color of sprites 2 and 3 to white. Line 2110 enables sprites 2 and 3, tells the computer that the data for both is in block 13, and sets the sprite 2 coordinates at (40,80). Line 2120 sets the sprite 3 coordinates at (10,120). Lines 2130 and 2140 set the sprite expansion chosen by the user. Finally, line 2160 sets the sprite pointers to block 14 (a "blank" sprite), which erases them from the screen before returning to the main program.

```
 100 PRINT"(rvsE)(clr)C-64 SPRITE GENERATOR"
 110 INPUT"(down rvs)6(off)4 OR (rvs)P(off)ET  P(3left)";TM$
 120 :
 130 DIM D(63)
 140 PP=32822:IFTM$="6"THENPP=1078
 150 DL=30000
 160 SP$="                                          ":V=53248
 170 DN$="(home 24down)"
 180 FORI=0TO3:READST$(I):NEXT
 190 DATA "PASS ",CDRAW,IDRAW,ERASE
 200 FORI=55296TO56295:POKEI,3:NEXT:FORI=0TO62:POKE896+I,0:NEXT
 210 GOSUB4000:ES=32
 220 :
1000 REM INPUT ROUTINE
1010 GETC$:CH=0
1020 IFPF=0THENES=PEEK(PP):PF=1
1030 WW=PEEK(PP):POKEPP,WW-128-(WW<128)*256
1040 IFC$=""THEN1010
1050 IFC$="S"THENGOSUB7000:GOTO210
1060 IFC$="L"THENGOSUB8000:GOTO210
1070 IFC$="D"THENGOSUB3000:GOTO210
1080 IFC$="I"THENGOSUB2000:GOTO1010
1090 IFC$<>CHR$(19)THEN1120
1100 POKEPP,ES:PP=32822:IFTM$="6"THENPP=1078
1110 ES=PEEK(PP):GOTO1010
1120 IFC$=CHR$(147)THENGOSUB1500:GOTO1010
1130 IFC$=CHR$(141)THENGOSUB6000:GOTO1010
1140 IFC$=CHR$(13)THENGOSUB5000:GOTO1010
1150 IFC$="M"THENCH=41
1160 IFC$="N"THENCH=40
1170 IFC$="B"THENCH=39
1180 IFC$="G"THENCH=-1
1190 IFC$="J"THENCH=1
1200 IFC$="T"THENCH=-41
1210 IFC$="Y"THENCH=-40
1220 IFC$="U"THENCH=-39
1230 IFC$<>"H"THEN1260
1240 FF=FF+1:IFFF>3THENFF=0
1250 PRINT"(home rvs)MODE(off) = "ST$(FF):GOTO1010
1260 IFPEEK(PP+CH)<>32ANDPEEK(PP+CH)<>160THEN1010
1270 IFFF=1THENWW=ES:POKEPP,160:PF=0:GOTO1320
1280 IFFF<>2THEN1300
1290 IFC$=" "THENWW=ES:POKEPP,WW-128-(WW<128)*256:PF=0:GOTO1010
1300 IFFF=3THENPOKEPP,32:GOTO1320
1310 POKEPP,ES
1320 PP=PP+CH:PF=0:GOTO1010
1330 :
1500 REM CLEAR SPRITE
1510 PRINT:PRINT"(home down)";
```

```
1520 FORI=1TO21:PRINTTAB(14)LEFT$(SP$,24):NEXT
1530 PRINT"(home down)";:FORI=1TO23
1540 PRINTLEFT$(SP$,13):NEXT:PRINT"(home)":RETURN
1550 :
2000 REM DISPLAY SPRITE IMAGE
2010 IFTM$<>"6"THENRETURN
2020 GOSUB1530
2030 PRINT"(home down)EXPAND X ? (rvs)";
2040 GETEX$:IFEX$=""THEN2040
2050 PRINTEX$
2060 PRINT"EXPAND Y ? (rvs)";
2070 GETEY$:IFEY$=""THEN2070
2080 PRINTEY$
2090 FORI=1TO63:POKE831+I,D(I):NEXTI
2100 POKEV+23,0:POKEV+29,0:POKEV+41,1:POKEV+42,1
2110 POKEV+21,12:POKE2042,13:POKE2043,13:POKEV+4,40:POKEV+5,80
2120 POKEV+6,40:POKEV+7,120
2130 IFEX$="Y"THENPOKEV+29,8
2140 IFEY$="Y"THENPOKEV+23,8
2150 GETC$:IFC$=""THEN2150
2160 POKE2042,14:POKE2043,14
2170 GOSUB1530:RETURN
2180 :
3000 REM DATA LINES
3010 INPUT"(clr rvs)S(off)CREEN OR (rvs)P(off)RINTER  S(3left)";DV$
3020 DV=3:IFDV$="P"THENDV=4
3030 PRINT"(clr)";:OPEN4,DV
3040 PRINT#4,DL"DATA";
3050 FORI=1TO63:PRINT#4,MID$(STR$(D(I)),2);
3060 IFI/9<>INT(I/9)THENPRINT#4,",";:GOTO3080
3070 PRINT#4:DL=DL+1:IFI<>63THENPRINT#4,DL"DATA";
3080 NEXTI:PRINT"150 DL="DL:PRINT"RUN"
3090 CLOSE4:GOSUB10000:IFG$<>"Q"THENRETURN
3100 PRINTLEFT$(DN$,15):END
3110 :
4000 REM PRINT OUTLINE
4010 PRINT"(clr)"TAB(13)"(shift/space)";
4020 FORJ=0TO1:FORK=1TO8-J:PRINT"(shift$)";:NEXTK:PRINT"(shiftL)";:NEXTJ
4030 FORI=1TO7:PRINTTAB(13)"(shift$)";:NEXT:PRINT"(shift/space)"
4040 FORI=1TO21:PRINTTAB(13)"(shift')"TAB(38)"(shift%)":NEXT
4045 PRINTTAB(13)"(shift/space)";:FORJ=0TO1:FORK=1TO8-J
4050 PRINT"(shift#)";:NEXTK:PRINT"(shiftO)";:NEXTJ
4060 FORI=1TO7:PRINT"(shift#)";:NEXT:PRINT"(shift/space)"
4070 PRINT"(home rvs)MODE(off) = "ST$(FF):RETURN
4080 :
5000 REM CODE SPRITE
5010 PRINT:PRINT"(home down)";:POKEPP,ES
5020 PP=32822:IFTM$="6"THENPP=1078
5030 FORI=1TO63:FORK=7TO0STEP-1
5040 IFPEEK(PP)=160THENT=T+2K
5050 PP=PP+1:NEXTK:D(I)=T:T=0
5060 D$=MID$(STR$(D(I)),2):D$=RIGHT$("000"+D$,3)
5070 PRINT"    (4left)";D$" ";
5080 IFI/3=INT(I/3)THENPRINT:PP=PP+16
5090 NEXTI
5100 PP=32822:IFTM$="6"THENPP=1078
5110 ES=PEEK(PP):RETURN
5120 :
```

```
 6000 REM DECODE SPRITE
 6010 PRINT:PRINT"(home down)";:POKEPP,ES:PC=0
 6020 PP=32822:IFTM$="6"THENPP=1078
 6030 FORI=1TO63:D=D(I):FORK=7TO0STEP-1
 6040 IFD-2K=>0THEND=D-2K:POKEPP,160:GOTO6060
 6050 POKEPP,32
 6060 PP=PP+1:NEXTK
 6070 D$=MID$(STR$(D(I)),2):D$=RIGHT$("000"+D$,3)
 6080 PRINT"    (4left)";D$" ";
 6090 IFI/3=INT(I/3)THENPRINT:PP=PP+16
 6100 NEXTI
 6110 PP=32822:IFTM$="6"THENPP=1078
 6120 ES=PEEK(PP):RETURN
 6130 :
 7000 REM SAVE ON DISK OR TAPE
 7010 GOSUB9000:IFNS$="*"THENRETURN
 7020 IFDV$="D"THENOPEN1,8,13,NS$+",S,W"
 7030 IFDV$="T"THENOPEN1,1,1,NS$
 7040 FORI=1TO63:PRINT#1,D(I):NEXTI
 7050 CLOSE1:RETURN
 7060 :
 8000 REM LOAD FROM DISK OR TAPE
 8010 GOSUB9000:IFNS$="*"THENRETURN
 8020 IFDV$="D"THENOPEN1,8,13,NS$+",S,R"
 8030 IFDV$="T"THENOPEN1,1,0,NS$
 8040 FORI=1TO63:INPUT#1,D(I):NEXTI
 8050 CLOSE1:RETURN
 8060 :
 9000 REM SET UP
 9010 INPUT"(clr)NAME OF SPRITE  *(3left)";NS$
 9020 IFNS$="*"THENRETURN
 9030 INPUT"(rvs)D(off)ISK OR (rvs)T(off)APE  D(3left)";DV$
 9040 RETURN
 9050 :
 10000 REM WAIT
 10010 PRINTLEFT$(DN$,23)"HIT (rvs)SPACE(off) TO CONTINUE
 10015 PRINT"OR (rvs)Q(off) TO QUIT
 10020 GETG$:IFG$<>" "ANDG$<>"Q"THEN10020
 10030 RETURN
READY.
```

THIS IS THE LAST ISSUE IN VOLUME 4 OF THE PAPER. SUBSCRIBE TODAY SO YOU WON'T MISS A SINGLE ISSUE OF VOLUME 5.

Feature Article:
HARDWARE

Put Function Keys On Your CBM 8032

by Jerry Key

Many articles have shown how to hit multiple keys simultaneously to use such functions as scrolling the screen down, or deleting the rest of a line after the cursor. It is an unreliable method at best. Others have inserted new code into unused areas of the keyboard lookup table in the 'E' ROM, burned an EPROM, and added extra keys to gain other functions, but if I could obtain these functions by ?CHR$( ) or POKE, they must already be in the keyboard lookup table. The 8032 keyboard lookup table is found at $E6D1 through $E71F. Similar changes could be made to the FAT 40 by adding the proper codes, found at $E06B-$E65A. The Nov. '82 Micro has an article on converting a FAT 40 to a GRAPHICS 80.

The 8032 keyboard is serviced by an 18 pin connector coming from J5 on the main board, set up in an 8x10 matrix. To apply the layout of that matrix to the keyboard connector, open the CBM, look at the connector attached to the keyboard, with the keyboard placed normally in front of you, connector away from you. Then label it 1 to 18, left to right (the left wire is brown with white stripe and the right one is black), and apply those numbers to the following table to find the combinations that make up the computer's keyboard input.

CONTACT	9	10	11	12	13	14	15	16	17	18
1	2	1	esc	a	tab	q	left shift	z	rvs	left arrow
2	5	4	s	d	w	e	c	v	x	3
3	8	7	f	g	r	t	b	n	space	6
4	-	0	h	j	y	u	.	,	m	9
5	8*	7*	]*	rtn	back* slash	down	.*	0*	home	stop
6	cursor right	up arro	k	l	i	o	scroll down	top left	del line	:
7	text	n/a (6)	;	@*	p	[*	right shift	rep	/	n/a (4)
8	n/a (5)	9*	5*	6*	del	4*	3*	2*	1*	del end

NOTES:

1: Items with (*) asterisk don't have a normal shifted function, such as the numeric keypad. Other keys with single labels (TAB) are not identified.

2: N/A items are shown with the decimal value for that location in parenthses. The values do not correspond to PET ASCII functions, but could be used for some control charactors in modem communications.

3: The shifted function is the decimal value plus 127. It acts as the "inverse" of the unshifted function, such as the shifted function of scroll down would be scroll up, top left would be bottom right, etc.

4: The above table only applies to normal, upper/lower case mode. The graphic mode table is totally different.

While these combinations can be obtained with ?CHR$( ) or POKE statements, some are messy that way. Instead, I added function buttons to my 8Ø32. Take the case of POKE 224,X where X is the row number where you wish to set the top of a window. You first have to clear the screen and type the poke statement into an area below that poke position to avoid a messy screen above the window top. I find it much easier to clear the screen, move the cursor to where I want the TOP/LEFT corner of the window and hit a button. How about inserting a new line? Before, I either had to scroll down to a clear screen area and watch carefully as I typed in the new line, or re-list only to the new point of insertion. Now I place the cursor on the next line, hold shift and hit a button. Voila! I now have a blank line right where I want it, with the previous and next lines right there for reference! Remember, however, none of these added functions insert screen memory into regular memory. If you use the unshifted function (DEL LINE), the line is not gone from your program, only from the screen; instead, use DELETE-END-OF-LINE with the cursor right after the line number and hit RETURN.

The keyboard edgeboard connector conveniently leaves two holes through the connector to each contact. The connector from the main board doesn't cover these holes. To prepare the keyboard, remove the keyboard connector and the keyboard by removing 12 screws. To make the contacts more accessible, I inserted a small piece of buss wire through two holes on each contact I wanted to use and soldered them on top (my numbering is left to right with the keyboard INSTALLED). This gave me a small loop extending below the connector for attaching clips. You can put them on as many contacts as you choose, from the table. Once the loops are in place, any simple momentary contact switch will work when hooked to the contacts for the function desired, such as pin 6 and pin 15 for scroll down.

Since my 8Ø32 has a removable nameplate, I replaced it with plexiglass and mounted switches there. Some have used telephone keypads, but I used the following small pushbutton switches and miniature clips from Radio Shack, because they were easily available. Quantities depend on how many functions you desire:

1) Submini SPST Momentary Switch R/S 275-1571
2) Solid Buss Wire R/S 278-1341
3) Micro Test Clips R/S 27Ø-37Ø
4) Hook-up Wire R/S 278-1295 (use wire of your preference)

One jumper can hold several buttons when the same contact is used more than once. For instance, since contact 6 is used for scroll down (15), top left (16), and delete line (17), running a common lead from contact 6 to one side of these three switches is cleaner than three separate leads to contact 6. The other side of each switch goes to the contact for the desired function. For others, such as TEXT(GRAPHICS), one side goes to contact 9 and the other to contact 7. I f you want a shifted function, but not its unshifted counterpart (such as scroll up), one additional lead can change the shifted function to unshifted, but it may need a different switch. Since scroll up uses pins 6 and 15 and the left shift uses 1 and 15, a third lead could go to pin 1 so that your scroll will always be in the scroll down position when you hit the button. If you prefer, you could also use a do-it-yourself keypad. And for you machine language programmers, wouldn't a hex keypad be nice?

Acknowledgements:
Most credit goes to James Strasma, for his Graphic 8Ø application.

References

1. Programming the PET/CBM, Raeto West, pp. 266, 427-428.
2. The Transactor, Commodore Canada, Vol 2 Bulletin 12, pp. 38-39.
3. Compute!, August 1981, pp.1Ø5-1Ø6

Feature Article:
LANGUAGES

You May Not Want to Hear This!

by Len Lindsay

In May of 1981 came a major breakthrough for the PET/CBM: COMAL arrived, like a ray from heaven. COMAL is an advanced programming language for the non-professional. It includes the advantages of PASCAL without losing the friendliness of BASIC. COMAL has the ease of BASIC with the power of PASCAL. It also escapes the problems of both languages. Anyone who uses FULL COMAL (CBM COMAL version 1.Ø2) for a week, will not want to go back to BASIC. Version 1.Ø2 is available on disk for the 8Ø96, or as a plug-in board from Instrutek for any PET/CBM except the original PET with BASIC 1.Ø. Both the Danish and Irish school systems are now teaching COMAL as their official language with Sweden and England soon to follow. All of this is available through the COMAL USERS GROUP.

I have tried PILOT, FORTH and PASCAL. PILOT is easier to use than BASIC, but lacks power. FORTH is fast and well suited for industrial control applications. A one line program in APL (with triangles and squiggles) can do mathematical calculations BASIC would need 2Ø lines to do, but who can read it? C is good for non-typists, since it replaces BEGIN with brackets, but is unreadable. PASCAL is readable, but imposes too many rules and regulations. For instance, you must declare EVERY variable and specify it as REAL, INTEGER, etc.; most lines must end with a semicolon, and the program must finish with 'END.' (since PASCAL can't tell where the end is); and it handles strings and input/output poorly. Worst of all, it has no line numbers and uses an EDITOR separate from PASCAL.

If you are considering leaving BASIC, read the book PASCAL FROM BASIC, by Peter Brown (Addison-Wesley, c1982 for $12.95). It points out how BASIC can be improved with structure, and PASCAL's shortcomings. After reading it, you will not want to use either BASIC or PASCAL! As Brown says, "If you have been used to great freedom [with BASIC], you will come to regard your PASCAL compiler as a strict and fussy schoolmaster. You still have the chance to be creative, certainly, and you can still have fun, but you must play strictly by the rules.... It is strong on data structures but comparatively weak on the three R's: reading, 'riting and 'rithmetic. Its arithmetic lacks an exponentiation operator, and an omission felt by commercial programmers, decimal operation. It is not so much that PASCAL's input/output is short on facilities; it is just that some fundamental things are difficult or impossible to do."

If you know COMAL is far superior to BASIC, but still have not used COMAL, fear no more. The COMAL system is on your side. First, COMAL allows structured programming and even indents structures automatically so you can SEE them. (PASCAL uses a seven page program to list your program that way.) Second, COMAL allows a multiple line IF...THEN..ELSE. It has both REPEAT...UNTIL and a WHILE...ENDWHILE loop, along with the standard FOR...NEXT. Third, it has a wonderful case structure (replacing the ON...GOTO). Fourth, COMAL has multi-line FUNCTIONS and PROCEDURES, both allowing parameter passing and local or global variables. COMAL employs line numbers for editing, but does not GOTO them. You can DELete blocks of lines. The system will AUTOmatically prompt line numbers. A RENUMBER command is available. You can list all or part of your program, with automatic indenting, unless told not to indent. If you add a file name to LIST, the program segment will be listed to disk or tape. These segments can later be merged via the ENTER command. A disk directory can be printed in full, selectively using pattern matching, or by specific file types (PRG, SEQ, USR).

If you have a printer, it can be SELECTed on or off. Everything works the same on the printer as the screen, including TAB and ZONE. Once output looks nice on the screen, add the line SELECT "LP" (for line printer) and the printer will print exactly what was on the screen. COMAL provides two different

sequential file types, and random access disk files. (Standard PASCAL has only sequential files.) COMAL has GET$ and KEY$ statements, greatly improved over BASIC's GET. COMAL lets you easily "tack on" your own "keywords", by defining them as procedures or functions. Once a program is RUN, procedures and functions can be called from direct mode at any time.

COMAL has PRINT USING, to format numbers in neat columns, as well as PRINT AT, to specify row and column on the screen. It READs DATA statements (lacking in PASCAL). You can RESTORE the DATA pointer to any data using RESTORE NAME. COMAL also includes end of data (EOD) and end of file (EOF). BASIC has a TAB every ten columns on the screen. COMAL calls these ZONEs, and will work on both printer and screen. COMAL also has the CURSOR statement go where you wish. Text can also be read from the screen under program control. DIV provides division with an integer answer, while the MOD command gives the remainder of a division. The stop key can easily be disabled or enabled. TRUE and FALSE are part of COMAL as they are of PASCAL. PEEK and POKE are permitted, as well as SYS. Machine code can be loaded using OBJLOAD. Programs can be CHAINed together. String arrays can have up to 33 dimensions each with whatever top and bottom indices you choose; numeric arrays allow up to 36 dimensions.

COMAL allows string ($) and integer (#) variable names up to 78 characters long, with all characters being significant. The characters can include apostrophe, square brackets, backslash, and underline, along with 26 letters and 10 digits. The backslash and square brackets are used to represent special sounds in other languages, such as the Danish "ae" combination. There is no need for special words like MID$ to manipulate a string. Print part of a string by specifying its start and end character position. COMAL, unlike BASIC, also allows you to change a substring without affecting the rest of the string.

Even with all this power, COMAL is a very FRIENDLY language. It will often know what you want, but not require you to type it. For example, BASIC and COMAL allow you to skip the closing quote mark of a string constant if it is at the end of a line, but COMAL even puts that mark in for you. COMAL distinguishes between the comparison equals and the assignment equals (as does PASCAL) by use of the colon in front of the equal sign to mean assignment. If you forget to type the colon, COMAL will automatically include it. To add a number to a total in BASIC, you would say: T=T+N, while COMAL (like ALGOL) only requires: T:+N or TOTAL:+NUMBER. This feature is available for strings as well as numbers.

COMAL is so helpful that it often supplies keywords you leave out if it knows they belong. For instance, to select the printer for your output you can type SELECT "LP", but COMAL will insert the word OUTPUT and list the line as SELECT OUTPUT "LP". The word THEN (in the multi-line IF...THEN statements) can be omitted and will be supplied by COMAL.

CBM COMAL provides the same screen editor PET/CBM users take for granted. In addition, COMAL checks each line as it is entered for correct syntax. If it finds a mistake, it prints an error message under the line with the cursor at the suspicious spot. After you correct the mistake and press RETURN, the error message is erased and the overwritten line is restored. This is fantastic, especially the first few times you use COMAL.

I haven't used BASIC for over a year and haven't suffered any withdrawal symptoms. I enjoy using COMAL. It makes me feel like a great programmer.

WOULDN'T THIS MAKE A NICE GIFT?

Feature Article:
MACHINE LANGUAGE

Calling ML Programs Using Interrupts

by John Lemkelde

Three articles in The PAPER, vol. IV, issue 1, use the hardware interrupt vector (pointer) at location $90 and $91 in BASIC 4 and 2, to get to the program. I see a problem in the way programs are 'hooked' into the normal interrupt processing. Each routine will work great all by itself, but what if you want two or three routines to work together? Each routine knows where its entry address is located (Screen Scroll=$039D, Keyprint 4.0=$0367). The entry address and the first address of the program are NOT always the same. The routine stores the entry address into locations $90 and $91 in typical lo-hi 6502 address fashion. This connects the routine to the hardware interrupt vector. When an interrupt occurs, the routine decides whether to run it or not,(runs it,) and then JMPs to $E455 to allow the PET to continue its normal interrupt processing.

This is fine. You can call KEYPRINT 4.0 with the proper SYS command. It is now looking for the backslash key so it can print the screen. Now you want to use the Screen Scroll Prevention routine. When you call this routine, it replaces the address of the Keyprint 4.0 routine in locations $90 and $91 with its own entry address. This is OK for the Screen Scroll routine, because it now looks to see if the cursor is at the bottom of the screen. However, Keyprint 4.0 is left out, because the interrupt routine address ($90 and $91) isn't pointing to the entry address of Keyprint 4.0 any more. My first attempt to correct this problem, as shown in Listing 1, failed:

Listing 1

```
033A             ; SCREEN SCROLL PREVENTION
033A                        ORG $0392       ; TELL ASSEMBLER WHERE TO START
0392  4C 99 03              JMP START       ; GO AROUND HOLD AREAS
0395             INTHOLD1   BYT $00         ; ADDRESS OF PREVIOUS
0396             INTHOLD2   BYT $00         ; INTERRUPT (LO-HI)
0397             MYRTNH1    BYT $B0         ; ADDRESS OF SCREEN
0398             MYRTNH2    BYT $03         ; SCROLL PREVENT (LO-HI)
0399  78         START      SEI             ; DISABLE INTERRUPTS
039A  A5 90      SAVEINT    LDA $90         ; SAVE
039C  8D 95 03              STA INTHOLD1    ;  BOTH BYTES
039F  A5 91                 LDA $91         ;   OF CURRENT
03A1  8D 96 03              STA INTHOLD2    ;    INTERRUPT VECTOR
03A4  AD 97 03   POINTME    LDA MYRTNH1     ; POINT
03A7  85 90                 STA $90         ;  INTERRUPT
03A9  AD 98 03              LDA MYRTNH2     ;   VECTOR TO
03AC  85 91                 STA $91         ;    MYRTN
03AE  58         CONTINUE   CLI             ; ALLOW INTERRUPTS
03AF  60                    RTS             ; RETURN TO BASIC
03B0  A5 D8      MYRTN      LDA $D8         ; SHOULD MYRTN
03B2  C9 17                 CMP #$17        ;  BE DONE THIS
03B4  F0 03                 BEQ RESET       ; INTERRUPT? IF Y,GOTO MINE (RESET)
03B6  6C 95 03   RETURN     JMP (INTHOLD1)  ; IF NO,RET TO ADDR;SAVE IN INTHOLD
03B9  A9 00      RESET      LDA #$00        ; RESET
03BB  85 D8                 STA $D8         ;  CURSOR TO TOP LINE
03BD  F0 F7                 BEQ RETURN      ; GO TO INDIRECT JUMP
```

Great! Now I can turn on Keyprint with the proper SYS call. It saves its beginning address in the interrupt vector (pointer) at $90 and $91 and starts working. Next I turn on Screen Scroll Prevention with SYS 914. Notice that the

entry address of Screen Scroll has changed to $03B0, but the program's first address is still $0392 (decimal 914). Because of the program structure, the entry address may change, but the beginning address will not. The Screen Scroll routine saves the address of Keyprint (from $90 and $91) in a hold area called INTHOLD. Then Screen Scroll loads its address into $90 and $91 and starts working. However, instead of JMPing to $E455 when it is finished, it JMPs indirectly (OP CODE $6C instead of $4C) to the address in INTHOLD (in this case, the beginning address of Keyprint). Keyprint regains control, does its thing, and then JMPs to $E455 to finish its interrupt processing.

This creates a problem if you call the Screen Scroll routine more than once. When you call Screen Scroll the second time and enter the START section, the beginning address of Screen Scroll is in $90 and $91. The Screen Scroll routine saves it in INTHOLD, puts the same address at $90 and $91, and waits for the next interrupt. This next interrupt causes a jump to 'MYRTN', which eventually JMPs indirectly to what is in INTHOLD. Since this is now the address of Screen Scroll instead of Keyprint, you go into a loop. Now how do you fix this ? To solve the loop problem, the additional code in Listing 2 checks to make sure you don't save your own address in the hold area:

Listing 2

```
033A                ; SCREEN SCROLL PREVENTION
033A                        ORG $0392       ; TELL ASSEMBLER WHERE TO START
0392  4C 99 03              JMP START       ; GO AROUND HOLD AREAS
0395              INTHOLD1  BYT $00         ; ADDRESS OF PREVIOUS
0396              INTHOLD2  BYT $00         ; INTERRUPT (LO-HI)
0397              MYRTNH1   BYT $BE         ; ADDRESS OF SCREEN SCROLL
0398              MYRTNH2   BYT $03         ; PREVENT (LO-HI)
0399  78          START     SEI             ; DISABLE INTERRUPTS
039A  A5 90                 LDA $90         ; IS MYRTN ADDRESS
039C  CD 97 03              CMP MYRTNH1     ;  IN LOC $90
039F  D0 07                 BNE SAVEINT     ; IF NOT, SAVE IT
03A1  A5 91                 LDA $91         ; IS MYRTN ADDRESS
03A3  CD 98 03              CMP MYRTNH2     ;  IN LOC $91
03A6  F0 14                 BEQ CONTINUE    ; IF YES, DON'T SAVE IT
03A8  A5 90       SAVEINT   LDA $90         ; SAVE
03AA  8D 95 03              STA INTHOLD1    ;  BOTH BYTES
03AD  A5 91                 LDA $91         ;   OF CURRENT
03AF  8D 96 03              STA INTHOLD2    ;    INTERRUPT VECTOR
03B2  AD 97 03  POINTME     LDA MYRTNH1     ; POINT
03B5  85 90                 STA $90         ;  INTERRUPT
03B7  AD 98 03              LDA MYRTNH2     ;   VECTOR TO
03BA  85 91                 STA $91         ;    MYRTN
03BC  58          CONTINUE  CLI             ; ALLOW INTERRUPTS
03BD  60                    RTS             ; RETURN TO BASIC
03BE  A5 D8       MYRTN     LDA $D8         ; SHOULD MYRTN
03C0  C9 17                 CMP #$17        ;  BE DONE DURING THIS
03C2  F0 03                 BEQ RESET       ; INTERRUPT? IF Y, GOTO MINE (RESET)
03C4  6C 95 03    RETURN    JMP (INTHOLD1)  ; IF NO, RET TO ADDR; SAVE IN INTHOLD
03C7  A9 00       RESET     LDA #$00        ; RESET
03C9  85 D8                 STA $D8         ;  CURSOR TO TOP LINE
03CB  F0 F7                 BEQ RETURN      ; GO TO INDIRECT JUMP
```

If you call the Screen Scroll routine first, it will work fine, because it saves $E455 in the hold area. Then if you CALL Keyprint, it will both 'unhook' from the interrupt routine and be the only one there. Thus, to help us CALL these routines in any order, ALL routines MUST use the same initialization coding. I hope this will help you in merging different machine language routines.

Feature Article:
MACHINE LANGUAGE

ML Programming Assists

by Emil Volcheck

I have found two programming assists to be very useful. The first is a BASIC utility program that reads a section of memory where a machine language program is contained. It converts the group of bytes it reads into a series of data statements, each of which contains the decimal values for eight bytes. The data statements begin with the line number 1000 and follow in increments of 10.

After producing the initial series of DATA statements, the program then generates the equivalent of a hex dump of the same area of memory. These are also arranged in lines of eight bytes, preceded by the hex address of the first byte of each line. This corresponds exactly to what you will see with an .M command from the monitor. Line numbers start with 5000 and the contents of each line are exactly the same as the decimal numbers in the data statements in the set beginning at line 1000. You can then easily compare the decimal numbers with the monitor output. Finally, using the "dynamic keyboard" approach, the program itself is deleted, leaving only the DATA statements beginning at line 1000 and the hex dump beginning at line 5000.

Everything takes place automatically after the user enters the start and end addresses of the desired machine code program. The DATA and dump statements should then be saved to tape or disk for later use. When typing the following listing into your machine, be sure to type lines 130, 140 and 250 exactly as shown, with no spaces and the two character abbreviation for the DATA command. Otherwise, the program will abort with an error.

```
10 REM * AUTOMATIC ML TO DATA/DUMP STATEMENTS *
20 REM BASED ON GREG YOB, CREATIVE COMPUTING, 1980 OCT, P170
30 REM BY EMIL VOLCHECK, 1301 BYTES, 1981 OCTOBER 04, V4.2
40 CLR:PRINT"(clr)(2down)DATA MAKER FROM MACHINE LANGUAGE"
50 INPUT"(2down)QQSTART ADDR, END ADDR";S,E:N=S
60 INPUT"(2down)FIRST LINE #, INCREMENT - 1000,10(10left)";F,I:GOTO80
70 READ F,I,S,E,N
80 PRINT"(clr)STATEMENTS WILL ENTER AUTOMATICALLY":PRINT"(2down)";
90 FORL=1TO8:PRINTF"DATA ";:FORD=0TO7:PRINTMID$(STR$(PEEK(N)),2);
100 N=N+1:IFN>ETHEN140
110 IFD=7THENPRINT:GOTO130
120 PRINT",";:NEXTD
130 F=F+I:NEXTL:PRINT"RUN70(home)(2down)180Da"F","I","S","E","N"(home)";
135 GOTO350
140 F=F+I:PRINT:PRINT"RUN150(home)(2dowm)180Da"F","I","S","E","N"(home)";
145 GOTO350
150 READ F,I,S,E,N:N=S:F=5000:GOTO170
160 READ F,I,S,E,N
170 A$="0123456789ABCDEF":DL=N:GOSUB280
180 DATA 1000,10
190 PRINT"(clr)STATEMENTS WILL ENTER AUTOMATICALLY":PRINT"(2down)";
200 FORL=1TO8:PRINTF":"HL$" ";:FORD=0TO7:DE=VAL(MID$(STR$(PEEK(N)),2))
210 GOSUB270:PRINTH$;
220 N=N+1:IFN>ETHEN260
230 IFD=7THENPRINT:DL=DL+8:GOSUB280:GOTO250
240 PRINT" ";:NEXTD
250 F=F+I:NEXTL:PRINT"RUN 160(home)(2down)180Da"F","I","S","E","N"(home)";
255 GOTO350
260 PRINT:PRINT"RUN 320(home)(down)";:GOTO350
270 X=INT(DE/16):Y=DE-X*16:X$=MID$(A$,X+1,1):Y$=MID$(A$,Y+1,1):H$=X$+Y$:RETURN
```

```
 28Ø B=1:C=3:D=4Ø96:DM=DL+1:HL$=""
 29Ø IFDM-D>ØTHENDM=DM-D:B=B+1:GOTO29Ø
 3ØØ HM$=MID$(A$,B,1):HL$=HL$+HM$:B=1:C=C-1:D=16C:IFC>-1THEN29Ø
 31Ø RETURN
 32Ø F=1Ø:L=36Ø
 33Ø B=33Ø:PRINT"(home)(2down)":FORI=FTOF+8ØSTEP1Ø:PRINTI:NEXT
 34Ø PRINT"F="F+9Ø":L="L":GOTO"B"(home)"
 35Ø POKE158,1Ø:FORI=ØTO9:POKE623+I,13:NEXT:END
 36Ø REM * PROGRAM STOPS WITH "UNDEF'D STATEMENT ERROR"
```

The second assist, MODEL LOADER, is a BASIC utility program to POKE into memory the DATA items produced by the first program. The program produces a running display to assure the user that the program has not crashed. Since the display slows down the POKing, it can be bypassed by changing line 16Ø to NEXT.

Once the user has modified lines 1ØØ-9Ø as desired, line 1ØØØ should be deleted. Then, the DATA and dump statements generated by the first program should be appended from tape or diskette, using any available programming aid. The combined BASIC program should be saved before it is run.

I will be happy to supply a cassette containing both utilities for $3. My address is 1Ø46 General Allen Ln, West Chester, PA 19380.

```
 1Ø CLR:NAME$="PROGRAM NAME"
 2Ø BYTES=ØØØØ:REM BYTES OF ML
 3Ø FIRST=ØØØØ:IFFIRST>1Ø17THEN5ØØ
 4Ø LAST=FIRST+BYTES-1
 9Ø REM 1Ø75 BYTES, 1981 SEPTEMBER 18
 1ØØ PRINT"(clr)":X=19-INT(LEN(NAME$)/2)
 11Ø PRINT:FORI=1TO4Ø:PRINT"-";:NEXT
 12Ø PRINTSPC(X)NAME$
 13Ø PRINT:FORI=1TO4Ø:PRINT"-";:NEXT
 14Ø PRINT"(down)NOW LOADING - PLEASE WAIT"
 15Ø FORI=FIRST TO LAST:READA:POKEI,A
 16Ø PRINT"(down)"I,A"(2up)":NEXT
 17Ø PRINT"(3down)PROGRAM IS LOADED"
 18Ø PRINT"(rvs)(down) INITIALIZE WITH SYS"FIRST"(1left) (off)"
 19Ø PRINT"(3down)DO YOU WISH INSTRUCTIONS - Y/N ?"
 2ØØ GETZZ$:IFZZ$<>"Y"ANDZZ$<>"N"THEN2ØØ
 21Ø IFZZ$="N"THEN48Ø
 23Ø REM - INSTRUCTIONS/NOTES GO HERE
 24Ø PRINT"(clr)":POKE59468,14
 25Ø PRINT"(2down)iINSTRUCTIONS WOULD FOLLOW HERE"
 26Ø PRINT"(down)tHEY SHOULD BE IN upper/LOWER CASE"
 27Ø PRINT"FOR EASE IN READING..."
 46Ø PRINT(2down) pRESS c TO CONTINUE"
 47Ø GETZZ$:IFZZ$<>"c"THEN47Ø
 48Ø PRINT"(clr)":POKE59468,12:END:REM OR NEW
 5ØØ REM - SET TOP OF BASIC MEMORY POINTER
 51Ø : LIMIT=PEEK(52)+256*PEEK(53):LIMIT=LIMIT-BYTES-1
 52Ø : HIGH=INT(LIMIT/256):LOW=LIMIT-HIGH*256
 53Ø : POKE48,LOW:POKE49,HIGH:POKE52,LOW:POKE53,HIGH
 54Ø : FIRST=LIMIT+1:LAST=FIRST+BYTES-1
 55Ø : GOTO1ØØ
 1ØØØ REM *** DATA STATEMENTS SHOULD BEGIN HERE
```

Feature Article:
PRINTER

Commodore 64 Printer Patch

by Larry Woolard

As some C64 owners may have discovered, there is a problem when you access a printer from a program. Very often (like 2 or 3 times a page) the printer will hang and freeze the keyboard. You have to shut down the computer or printer to regain control. The cause seems to be a timing problem between the video display chip and the 6510 processor chip. I solved the problem with 2 P OKEs that shut off the video signal to the screen while printing and then turn it back on when finished. The following subroutine replaces a normal PRINT# to do this:

```
50000 rem printer patch s/r
50010 rem using file #4, with data in a$
50020 poke 53265,11:rem screen off
50030 print#4,a$
50040 poke 53265,27:rem screen on
50050 return
```

These are the same POKEs that get the 1540 disk drive to work with the 64.

Until this is resolved (reportedly with a new printer ROM), be careful. Specifically question vendors about this problem before you buy a program that uses the printer.

Feature Article:
PRINTER

Multi-column Output of a List

by Gerry Eisner

If you have ever output a long sorted list to a printer, you have come across the problem of how the list should be read. It is easy to print:

```
Aaaa        Bbbb        Cccc
Dddd        Eeee        Ffff
Gggg        Hhhh        Iiii
```

This listing, however, is difficult to search. A proper listing should read:

```
Aaaa        Dddd        Gggg
Bbbb        Eeee        Hhhh
Cccc
```

A proper listing with equal length columns is easy to accomplish, because you simply tell the printer to output 1,4,7, then 2,5,8, etc. If, on the other hand, the number of items does not divide evenly into the number of columns, you must make an adjustment. The program below is set up for 3 columns, allowing 25 spaces per name on an 80 column printer.

```
10 DATA ALPHA,BRESSLER,COMMODORE,HALUZA,LONG ISLAND,THE PAPER,ZEBRA
20 FORI=1TO25:S$=S$+"A":NEXT: REM * MAX LENGTH OF ITEM NAME
30 N=7: REM * TOTAL # OF ITEMS
40 REM * R=ROW NUMBER  CHR$(29) IS THE FORMAT 'SKIP'
50 FORI=1TON:READIT$(I):NEXT: REM * GET ITEM NAMES
100 X%=N/3+.9: REM * TOTAL NUMBER OF ROWS, ROUNDED UP
110 OPEN2,4,2:PRINT#2,S$"  "S$"  "S$: REM * SET UP FORMAT
120 OPEN3,4,1: REM * PRINT DATA ACCORDING TO FORMAT
130 FORR=1TOX%: REM * WORK EACH ROW ACROSS
140 PRINT#3,IT$(R)CHR$(29)IT$(R+X%)CHR$(29)IT$(R+2*X%)
150 NEXT
```

```
160 CLOSE2:CLOSE3
```

If you want to ouput to the screen, the same program will work if you substitute TAB commands for the printer formatting. Also, a limitation of 25 rows on the screen (and 40 columns for the PET) limits the length and spacing of each item and of the list itself.

To change the number of columns, you adjust line 20 (length of item name), line 100 (divider of N), and lines 110 and 140 (number of columns). Be sure to add more data if you want to print more than four columns.

I ran into several bugs when developing this program. I found that I could not RUN this program twice in succession. After a properly spaced first run, I got a second run of 25 A's and three lines of unformatted data. A third run brought back the correct columns. I finally realized this had something to do with printer memory. I erased the memory by adding:

```
155 OPEN 4,4,5: PRINT#4: CLOSE4
```

The secondary address 5 prints to the memory and printing nothing erases it. This cured the format loss so that the columnar structure held from run to run. However, now the 25 spaces formatted for the first column was reduced to 20. This was corrected by adding five spaces before the first S$ in line 110. The cure finally permitted a 25 letter name in the first column and every other one after that. An explanation of the original bug, its correction, the secondary probl em and its correction would be sincerely appreciated.

Ralph Responds:

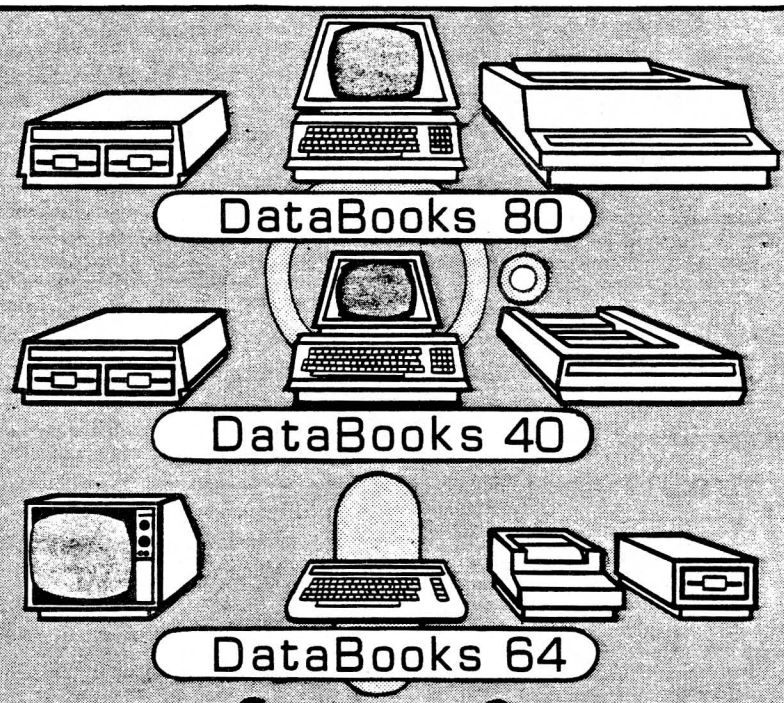
I sympathize with Gerry since I used to have similar problems with my old 2022 printer. Many of the printer commands seemed to misbehave, including formatting, line spacing and definable characters. Since I've gotten the new 4022 the problems don't seem to occur. [You can also replace the -04 printer ROM in the 2022 and 2023 with -07 ROM through Commodore.-ES]

As for the program presented, I see two problems. First, it is tied to the Commodore printer formatting. Second, as Gerry noted, changes must be made to print to the screen. The following program does the same thing, works on almost any printer and requires a minimum of changes for the screen.

```
10 DATAALPHA,BRESSLER,COMMODORE,HALUZA,LONG ISLAND,THE PAPER,ZEBRA
30 N=7:REM * TOTAL # OF ITEMS
50 FORI=1TON:READIT$(I):NEXT: REM * GET ITEMS
100 X%=N/3+.9
110 OPEN4,4: REM * OPEN FILE TO PRINT DATA AS SENT
120 FORR=1TOX%:REM * WORK EACH ROW ACROSS
130 REM * FOLLOWING LINES USE SPC AND LEN TO
140 REM PROVIDE FORMAT ON ALMOST ANY PRINTER
150 PRINT#4,IT$(R)SPC(25-LEN(IT$(R)));
160 PRINT#4,"  "IT$(R+X%)SPC(25-LEN(IT$(R+X%)));
170 PRINT#4,"  "IT$(R+2*X%)
180 NEXT
```

This version uses SPC and LEN to set up the 'formatting' in lines 150-170. The Commodore printers don't handle TAB correctly, but this may work better on other brands. The OPEN 4,4 can be changed to 4,3 to print to the screen. The 25's in the PRINT# lines would also have to be diminished for screen output.

DATABOOKS™



DMI

At Last, Affordable Software For Small Business.

DataMaster
1866 Bacon Street
San Diego, California 92107
(619) 223-4496

Micro-PACE

Computers, Inc.

1510 North Neil • Champaign, IL 61820 • 217-356-1883

Welcomes
Central Illinois PET Users
To Their New Store
We Have What You Need!

Complete ATUG Disc Library
Complete Library of Vic-20 Games
Over 10 Discs of Educational Programs
Complete Library of Public Domain Programs

If you are looking for **anything** for your Commodore
Including Something Different,
SEE US FIRST!

commodore
COMPUTER

Snow 'em with your VIC!

NEW

Simplify your printer set-up with

SMART ASCII $59.95

At last! A simple, convenient, low-cost printer interface. **It's ASCII:** connects the VIC or '64 to your favorite parallel printer (Epson, Microline, Smith-Corona TP-1, etc.). **It's SMART:** *translates* unprintable cursor commands and control characters for more readable LISTings.

Converts user port into parallel port with Centronics protocol, addressable as Device 4 or 5. **Three print modes:** CBM ASCII (all CAPS for LISTing); true ASCII (UPPER/lower case for text); and TRANSLATE (prints (CLR), (RED), (RVS), *etc.*). For **any size VIC** or the **'64**. Complete with printer cable and instructions.

UN-WORD PROCESSOR 2 . . . $19.95

The improved UN-WORD retains the practicality and economy of the original. Easy-to-use text entry and screen editing. Use with **any size VIC** (5K to 32K). Supports VIC printers, RS-232 printers, and now **parallel printers***, too. Handy user Menu selects: single- or double-space, form feed, print width, number of copies. Supports printer control codes. With complete documentation.

*Parallel printers require an interface. See SMART ASCII.

BANNER/HEADLINER $14.95

Make GIANT banners on your printer. Prints large characters across the page or sideways down the paper roll . . . how about a 10-ft. long "Welcome Home!". VIC or RS-232 printers.

VIC-PICs . . IMPROVED! . . $19.95

Now with **hi-rez draw routine** for your joystick *PLUS* hi-rez **dump to VIC printer.** Features 19 fascinating hi-rez *digitized* pictures. Capture *your* creativity, or ours, on paper. Amazing fun!

GRAFIX DESIGNER $14.95

Design *your own* graphic characters! Recall, erase, edit, copy, rotate . . . save to tape or disk for use in your own programs. Simple to use. Includes examples and demo routines.

GRAFIX MENAGERIE $14.95

Three-program set shows off VIC graphics potential for art, science, music, business . . . learn by seeing and doing. Contains BASIC **plotting routines** you may extract and use.

TERMINAL-40 . . . . . $29.95

Join the world of telecommunications in style: **40-character lines** and **smooth scrolling** text for easy reading! All software — no expensive hardware to buy. **4K** (or larger) **Receive Buffer** with optional dump to VIC printer. Function key access to frequently-used modes. Fully programmable Baud, Duplex, Parity, Wordsize, Stopbit, and Linefeed; supports control characters. Requires VIC-20, 8K (or larger) memory expansion and suitable modem. With 24 p. manual and Bulletin Board directory.

VIC-20 is a trademark of Commodore Business Machines

ORDER DESK
Open 9 am - 4 pm
(816) 254-9600
VISA/Mastercard add 3%
C.O.D. add $3.50

MAIL ORDER: Add $1.25 shipping and handling. Send money order for fastest delivery. VISA/Mastercard send #and exp. date (3% added). Missouri residents include 4.6% sales tax. Foreign orders payable U.S.$, U.S. Bank ONLY; add $5 shipping/handling.

All programs on high quality digital cassette tape.

Write for free brochure. Dealer inquiries invited.

MIDWEST MICRO associates
PO BOX 6148, KANSAS CITY, MO 64110

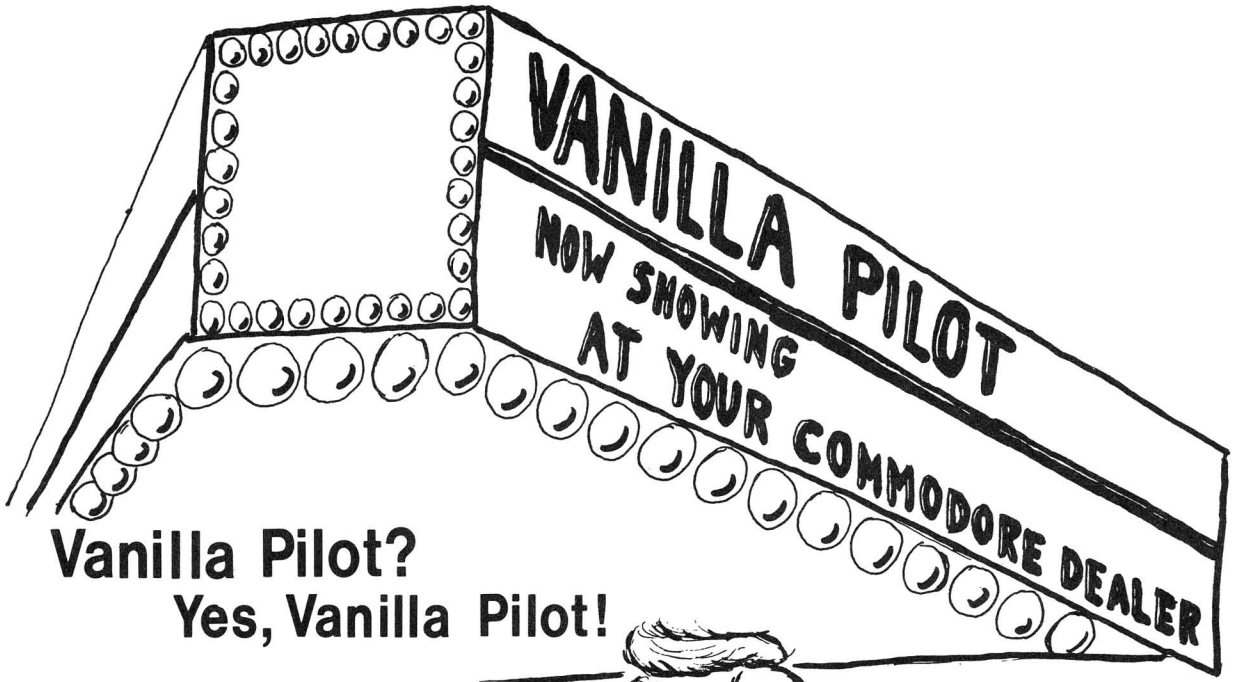
Introducing **SOFTWARE FOR THE NEW COMMODORE 64**

'64 TERMINAL ($29.95). Same impressive features as TERMINAL-40: **smooth-scrolling,** 40-character lines, VIC printer dump, etc. **GIANT 24K Receive Buffer.** No memory expansion required; requires '64 and modem.

'64 GRAFIX SAMPLER ($19.95). Indulge in the graphics splendor of the '64. Interact with demos of techniques such as **plotting** of points, lines and 3-D objects; **drawing** in the hi-rez mode (joystick control); animating **sprites;** plus assorted graphics displays. Routines may be extracted for use in your own programs.

'64 PANORAMA ($19.95). Explore picture graphics on the amazing '64! Nineteen fascinating *digitized* pictures PLUS **hi-rez draw routine** for your joystick AND hi-rez **dump to VIC printer**. Capture our pics or *your* creativity on paper.

'64 BANNER/HEADLINER ($19.95). Make **GIANT banners and posters** with your '64 and printer. Supports VIC printers, RS-232 printers (requires interface), and parallel printers (requires Smart Ascii).



Vanilla Pilot?
Yes, Vanilla Pilot!

What is Vanilla Pilot?

Vanilla Pilot is a full-featured pilot language interpreter including TURTLE GRAPHICS for the PET or CBM 4000, 8000, 9000 and CBM-64 series computers.

At last! A Pilot interpreter for the Commodore computers. This Pilot includes some powerful extensions to the screen editor of the computer. Things like FIND/CHANGE, TRACE and DUMP enhance the programming environment.

The TURTLE has a very powerful set of graphics commands. You can set the Turtle's DIRECTION and turn him LEFT or RIGHT. The pen he carries can be set to any of the 16 colors in the CBM-64. He can DRAW or ERASE a Line.

What else? Vanilla Pilot is all this and much, much more. In fact, we can't tell you about all of the features of the language in this small ad. So rush down to your local Commodore computer dealer and ask him to show you Vanilla Pilot in action. Be sure to take the $2.00 discount coupon.

Hurry, you have only a short time to redeem your coupon. So use it now!

Tamarack Software
Darby, MT. 59829

SAVE $2.00

VANILLA PILOT

Retailer: Send the redeemed coupons to Tamarack Software, Darby, MT 59829. We will pay $2. plus $.35 handling for the redemption of these coupons. If requested, invoices showing sufficient purchase of Vanilla Pilot must be submitted. Coupons submitted to us more than 30 days after the expiration date will not be honored.

Expires April 15, 1983.

RESOURCES

Here are the addresses for companies mentioned or advertising in this issue. To be sure of being listed, just send us a review or an ad. Readers please include company addresses for reviews or comments you send.-ED

A.B. Computers 252 Bethlehem Pike, Colmar PA 18915
ACT (Sirius) Ltd. Freepost, Halesowen, West Midlands ENGLAND B63 1BR
AID 5901 John Martin Drive, Minneapolis MN 55430
Amplify Incorporated 2325 Macbride, Iowa City IA 52240
Audiogenic P.O. Box 88, Reading, Berks. ENGLAND
Avalon Hill 4517 Harford Rd., Baltimore MD 21214
Batteries Included 71 McCaul St., Toronto ONT M5T 2X1 CANADA
BPI 3423 Guadalupe, Austin TX 78705
Canadian Micro Dist.(CMD) 500 Steeles Av., Milton ONT L9T 3P7 CANADA
Christian/Computer-based Commun., 258 Lake Promenade,Toronto ONT M8W 1B3 CANADA
The Code Works P.O. Box 550, Goleta CA 93116
COMAL Users Group & COMAL Catalyst 5501 Groveland Terrace, Madison WI 53716
Commodore U.S. & magazine The Meadows, 487 Devon Park Rd., Devon PA 19087
CompuServe 5000 Arlington Centre Blvd., Box 20212, Columbus OH 43220
Computer Systems Group University of Waterloo, Waterloo ONT CANADA N2L 3G1
Creative Software, 201 San Antonio Circle#270, Box 4030, Mountain View CA 94040
DataMaster (DMI) 1866 Bacon St., San Diego CA 92107
DES 8315 Firestone Blvd. Downey CA 90241
Delmart Company 530 North Wheeler St., St. Paul MN 55164
Dr. Daley Software: see Tamarack Software
Dynacomp 1427 Monroe Av., Rochester NY 14618
Execom 1901 Polaris Av., Racine WI 53404
Foxfire Systems P.O.Box 507, Deer Park, TX 77536
Hardcopy c/o John Walker, 8737 Wildforest, Houston TX 77088
Hayden Book Company 50 Essex St. Rochelle Park NJ 07662
Human Engineered Software (HES) 71 Park Lane, Brisbane CA 90066
HUH Electronics 1429 Maple St., San Mateo CA 94402
Info-Designs 6905 Telegraph Road, Birmingham MI 48010
The Jeffries Report: see The Code Works
Leading Edge Computer Porducts 225 Turnpike St., Canton MA 02021
Micro Systems 11105 Shady Trail #103, Dallas TX 75229
Micro-Pace Computers 1510 N. Neil, Champaign IL 62549
Microdigital 752 John Glenn Blvd., Webster NY 14580
Midwest Micro Associates Box 6148, Kansas City MO 64110
MIS 250 Fern Rock Way, Boulder Creek CA 95006
Northern Bytes,c/o Jack Decker,1804 W.18th St,Lot 155,Sault Ste. Marie MI 49783
Nufekop Box 156, Shady Grove OR 97539-0156
On Line Software Box 2044, Orcutt CA 93455
Osborne/McGraw-Hill 630 Bancroft Way, Berkeley CA 94710
Personal Computing Box 2941, Boulder CO 80321
Professional Software 51 Fremont St., Needham MA 02194
Protecto Enterprises Box 550, Barrington IL 60010
Quill Office Supplies & Equipment 100 S. Schelter Road, Lincolnshire IL 60069
Richvale Telecommunications 10610 Bayview, Richmond Hill ONT Canada L4C 3N8
William Robbins Box 3745, San Rafael CA 94912
SuperPET Gazette Box 411, Hatteras, NC 27943
Skyles Electric Works 231 E S. Whisman Rd., Mountain View CA 94041
Tamarack Software Water St., Darby MT 59829
TNW Corporation 3351 Hancock St., San Diego CA 92110
Transonic Laboratories 249 Norton St., Mankato MN 56001
United Microware Industries (UMI) 3431-H Pomona Blvd., Pomona CA 91768

Visicorp	2895 Zanker Rd., San Jose CA 95134
Voicetek	Box 388, Goleta CA 93116
Warren Radio	800 S.W. Jefferson, Peoria IL 61600
WATCOM	Box 943, Waterloo ONT CANADA N2J 4C3
Wunderware	Box 1257, Jacksonville OR 97530

COMING UP NEXT ISSUE

More programs and reviews for the 64
Reviews of 16 VIC games from Victory Software
And the articles we didn't have room for this time, including:
"Machine Language Compare", by Arthur Cochrane
"Quick Reference to WordPro", by Jim Strasma
"Two Computers are Better Than One," by Bob Boynton
"CBM Professional Computer Guide Errata", by Keith Peterson

FOX 20: ™ The magazine for *VIC-20 users

© 1982

FOX 20 will provide you, each month, with 5 or more ready-to-run programs on cassette - exciting, imaginative game, educational, and utility programs for all VIC memory configurations. In addition, you will receive Foxtales, an informative Video Newsletter, on Side 2. Novice and pro alike, **FOX 20** is the magazine for you. Be a sly little fox for only $43 a year - Subscribe to:

FOX 20:™

P.O. Box 507, Deer Park, Texas 77536
FOX 20 is a division of: Foxfire Systems, Inc.
3811 Newton, Pasadena, Texas 77503
Dealer Inquiries Invited (713) 473-6723
Texas residents add 5% Sales Tax
Canada and overseas $53
Orders pre-paid
U.S. Dollars only

*VIC-20 is a trademark of Commodore Business Machines, Inc.

TABLE OF CONTENTS

THE MIDNITE SOFTWARE GAZETTE

NOTES:
Midnite Meanderings, by Jim Strasma----3
Advertising Notes----------4
ATUG Notes, by Brent Anderson----------4
CBM/PET Programming Notes----------5
CBM 64 Notes, by Ken Penny----------6
More CBM 64 Notes from readers---------8
Church Notes, by John Easton----------9
Commodore Notes----------10
Competitor Notes----------11
Copyright Notes----------12
Dealer Notes----------13
Disk Notes----------14
Education Notes----------15
Midnite Gaming Notes, by Jim Oldfield-15
Ham Notes, by Clark L. Stewart--------16
Modem Notes, by Tim Tremmel----------17
Reader Questions and Comments---------18
User Group Notes----------18
VIC Notes, by John O'Hare----------19
Want Ads and Answers----------19

RESOURCES----------65

COMING UP----------66

ADVERTISEMENTS------30,36,62,63,64,65,67

TABLE OF CONTENTS----------Back Cover

CBM/PET REVIEWS:
Book Reviews----------20
Business Reviews: Accounting---21
Data Base Managers----------21
Word Processors----------22
Education Reviews----------23
Game Reviews----------24
Hardware Reviews: Disk Drives--25
Printers, Upgrades----------26
Interfaces, Networking-------27
Other Equipment----------28
Language Reviews----------28
Magazine Reviews----------28
Modem Reviews----------29
Utility Reviews----------30

Commodore 64 REVIEWS:
Business Reviews: Mail Lists---31
Word Processors----------32
Education Reviews----------33
Game Reviews----------33
Hardware Reviews: Disk Drives--34
Printers, Interfaces---------34
Other----------35
Language Reviews----------36
Utility Reviews----------36

VIC REVIEWS:
Game Reviews: Cassettes--------37
Cartridges----------39
Hardware Reviews----------41
Language Reviews----------42
Magazine Reviews----------42
Monitor Reviews----------42

THE PAPER

ARTICLES:
General:----------Apple 20, TRS-80 12, Commodore 6, by Ralph Bressler--------43
BASIC:------------Runes - a Cipher Generator for PET, by Lindsay Doyle-------44
64 Graphics:------C-64 Sprite Generator, by Ralph Bressler----------47
Hardware:---------Put Function Keys on a CBM 8032, by Jerry Key----------52
Other Languages:--You May Not Want to Hear This! by Len Lindsay----------54
Machine Language:-Calling ML Programs Using Interrupts, by John Lemkelde-----56
ML Programming Assists, by Emil Volcheck----------58
Printer:----------64 Printer Patch, by Larry Woolard----------60
Multi Column Printer Output, by Gerry Eisner----------60