

The Commodore Magazine For Commodore Users

October 1994
Vol. 3 No. 7 Issue 23
Please display until November 20

USA \$2.95
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dis HARD

the Flyer for Commodore 8biters
The Digital Nightmare

GEOS Workdisks
The Right Way!

Dale Sidebottom gets you started.

LOADSTAR128!!
The Spotlight looks at the 2
LOADSTARS!!


A Case In Point:
Exterminating the
1541/71 Relative File Bug!!

Q-RIP
Nothing here about it!

Collector's Corner
Gil Parrish looks at
the Stringy Drive.



Spotlight on **LOADSTAR 123**

The Loadstar Files	
Brainware	
Helpware	
Grafixware	
Musicware	
Geosware	
	Geosware GEO-Sprites Lilith Font Close this window

FOUR FONTS FULL OF FABULOUS FIGURES

Issue #123 Press H for Help Side #4

LOADSTAR #123 and LOADSTAR 128 #24 have something for just about every taste between the two of them.

We'll start with LOADSTAR #123. For programmers, there is FCompare, a program to compare two disks on a dual (or better) drive system. There are also two articles for machine language programmers and a full-function filled hexadecimal calculator, including AND, OR and NOT functions.

If you like games and puzzles, you're in the right place. **Jungle** is a highly addictive puzzle game for everyone who was ever jealous of the best part of Windows: **Minesweeper!** Dave Moorman has written a fantastic two-player chess-based game called **Global Chess**. The board is the same, but everything else is different! Oh, you still have your rooks, bishops, knights and pawns, but you have twice as many! There is also a small addition to the royal family, namely, the Prince and Princess. Just to make matters worse, all the pieces wrap around the board, so you have not one, but TWO fronts to fight on. Also on hand are a Famous People game and the ever present **Puzzle Page**. Gamers with devious and greedy hearts would do well to check out the latest in the **Stratagems** series (#11). These little beauties allow unlimited lives and other nefarious means to advance to that next level.

If graphics is your paintbag, you'll want to check out **Printmeister** to print out and organize those Print Shop graphics. Just to make life interesting, a small collection of PS graphics is included to get you started.

The first installment of **The Complete Dave**, built around Dave Marquis' contributions to LOADSTAR over the years, is present and accounted for, checking-in to the Musicware category, as well as two GEOS fonts, one all the way from Australia!

LOADSTAR 128 is also packed with goodies. Two programs, with accompanying docs, help you get into programming the 1351 mouse for the 80 column screen. **Sidewinder** is a keyboard overlay printer for your 128 or 128D. **Murder in the Monastery** now comes in an annotated version. **Stockbroker 128** simulates the ups and downs of life for up to eight players. If you're really of a mind to go OUT of your mind, give **Quadra** a try. A tile flipping game where you try to match your pattern to another, this one is NOT for the faint of heart.

If any of this grabs you and threatens grievous bodily harm, you can contact Softdisk this way: **Softdisk Publishing**, P.O.Box 30008, Shreveport, LA, 71130-0008. Or call 1-800-831-2694 or 1-318-221-8718

READY.



Found Only on the Spinner



Halloween treats found *only* on the *Spinner*: Tired of typing all those DATA statements when you're coding sprites or typing in one of our incredible PRG? Try **Autodata 64** or **128**. Makes DATA statements a breeze. Want utilities? Try **F-Key Utility 128**. Makes programming the 128 f-keys so simple, you'll wonder why you didn't think of it yourself. Also see **CrazyWindows 128** for a demonstration of the Window command in BASIC 7.0. Oh, and be sure to check out the important message in the windows... We have a few other tricks and treats up our sleeve... namely **One Dark Night II**, **Digital Nightmare**, **Halloween '94**, **Witch Hazel's Hangout** and **Ghoulbreakers128!**

Where do you get the *Spinner*? Just send \$5 to **dieHard**, P.O.Box 392, Boise, Idaho, 83702-0392.

READY.

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RAMLink

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HD Series Hard Drives are available in capacities up to 1 GB, are fully partitionable, and can emulate 1541, 1571, & 1581 disks while Native partitions utilize MSDOS-style subdirectories. HD's connect easily to the serial bus or parallel via RAMLink. Includes built-in JiffyDOS, SWAP feature and RTC. HD's offer superior compatibility with most commercial software including BBS, Productivity and GEOS. And with new pricing, HD Series drives offer the lowest cost per megabyte of any C64/128 storage device.



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View From The Underground

By
Brian L Crosthwaite



The old 1581 is working over time tonight. It's like a pain in the head that just wont go away. Just when I think I'm ready to save my document, I hear it. It starts off low at first, then it builds up. It's a kind of dripping sound, like the sound of... now it's gone. All I hear now is the drive.

Guess I should backup this disk -- it's back -- that dripping sound. The building outside my window is grey and alive with shadow. I've never heard anything like this before; it's as though it were breathing. But that would be silly. It's just a dripping sound.

There now, see it's stopped. The drive is working.... A siren goes down the street. The sound fades into almost silence -- except for the dripping. It is getting louder.

I need to get a backup disk from the storage room. I will take my mind off that stupid dripping. Ah, double sided double density -- huh. What is the copier doing on? I swore I turned it off twenty minutes ago. Hey! who turned on the hall lights?!?!

"Hello?" Silence.

What was that!? "Who is there?" "Hello?" "Mia?" "Jerry?" I swear, someone just touched me on the shoulder! Who would be here this late at night? "Ok? who's there?"

Boy that was weird. I'll take that dripping sound any day. Just grab a disk and get back to my office.

Ok, let's format this puppy and backup my master -- My computer is turned off! What the --

"What do you want? You're dead -- I killed you!!!"

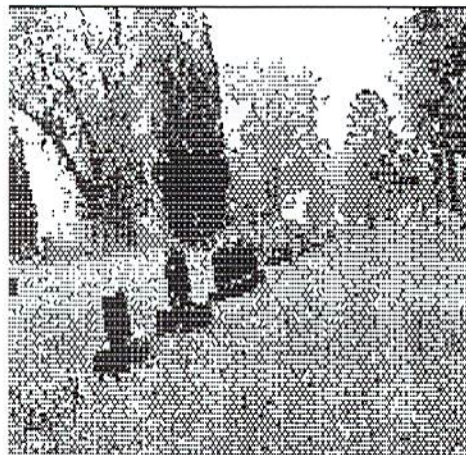
... Drip drip drip...

Woah! Talk about a bad dream -- that was a B-Dream. Well, as many of

you know Autumn is the time of year I reflect. Things start to change radically this time of year. The weather breaks into cooler temperatures and the days grow shorter.

dieHard is more than I had ever dreamed it would be. Our circulation has grown to well over 16,000 readers! We just got our new Associate Editor -- Jerry Hill. He came to us from the University Place Commodore Users Group -- UPCHUG (I love that name).

Things have been a little chaotic as of late. Sandi went in for hip surgery, Mia



and I are expecting, and we are desperately understaffed. We have been so incredibly behind with just about everything, Jerry had to start out running on his first day! Sandi is doing fine; in fact, she is working part time now! And Mia has been pretty much as sick as she was with our first!

If you expected us to do something lately and we haven't, please bear with us -- we are two months behind on just about everything!!!!

We have a lot of R.I.P.s this month. As of October 31, 1994 Q-Link will cease to exist. :(

When TENEX sells its existing stock of C64/128 and Amiga stuff, it will no

longer support that market.

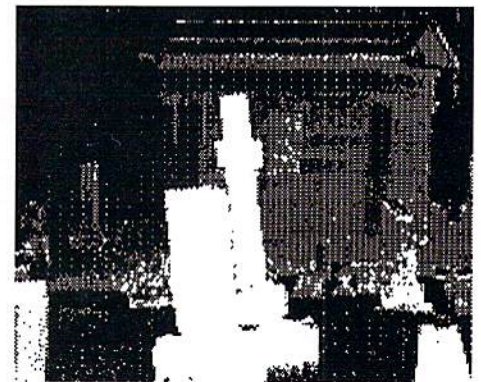
Nothing new on the Commodore front as far as there even being a Commodore.

On the upside, LCII is now the American distributor of Performance Peripherals Inc. products. Stay tuned for the next season when we go *crazy* with *REVIEW!*. We plan to have a mega blowout kind of a thing.

This month we are rerunning the **One Dark Night** as we planned last year whether we implement the sprites or not! One way or another, it will be on the *Spinner!* We have fractal mania on this month's *Spinner* as well as some great Halloween programs. Check it out on the inside front cover!

The graphics found in this issue come from a wide variety of sources. Keep in mind that many of them are copyrighted. Please do not scan them. If you can afford a scanner you can afford to buy the graphics. If you can't afford them, then you shouldn't have bought the scanner! Well with that said (I hope that makes you feel better Jeff!) let's get on with this months issue!

READY.



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Fonts used in
this issue:

GEOS:
LW_Roma

LW_Barrows
Commodore

TT Graphics
Whimsey



Run Power Pak I
Wellington



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dieHard, the *Flyer for commodore 8biters* is published 10 times per year. Printed in U.S.A. by Northwest Printing, Inc. in Boise, Idaho.

Subscription Rates: \$2.95 for single copy and \$16.97 for one year subscription for U.S. and possessions; \$3.95 and \$20.97 for Canada (in U.S. Funds); \$3.95 and \$24.97 all other countries (in U.S. Funds). The *Spinner* rates are: single copy \$5.00 and \$45.00 for one year subscription for U.S. and possessions; \$6.00 and \$55.00 for Canada (in U.S. Funds); and \$6.50 and \$65.00 all other countries (in U.S. Funds). Joint *Flyer/Spinner* one year subscriptions are \$49.97 for U.S. and possessions; \$59.97 for Canada (in U.S. Funds); \$69.97 all other countries (in U.S. Funds).

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Correspondence: Please address correspondence to *dieHard*, Editors, P.O.Box 392, Boise, Idaho, 83701-0392. Letters or questions may be published unless specifically requested not to. Sorry, we cannot personally respond to questions or comments due to the large volume of mail received, although the questions or comments may be published in *dieHard*. However, we do read every letter we receive.

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The graphics found in this month's issue are from *KF-PD*, *TV/BUG* and *UPCHUG* public domain libraries, *Digital Nightmare*, *Jerry Hill*, and *John Green's Halloween '94*

dieHard, the *Flyer for commodore 8biters* (USPS Pending) is published monthly except for bi-monthly issues in January/February and July/August for \$16.97 per year by LynnCarthy Industries, Inc., 816 W. Bannock, Suite 502, Boise, ID, 83702-5850. Application to Mail at Second-Class Postage Rates is Pending at Boise, Idaho. **POSTMASTER:** Send address changes to *dieHard*, P.O.Box 392, Boise, Idaho, 83701-0392. Printed in the U.S.A.

INPUT; READERS

In your Q&A section, Charles M. Cook mentioned a need for SID music. The best source I know of is: DISKS O' PLENTY Inc., 7958 Pines Blvd., Suite 270, Pembroke Pines, FL 33024. They are Public Domain and ask \$7.00 for a 6-pack (3 disks both sides).

The review of the MACH 128 cartridge in *dieHard* failed to mention that if you use the Disk Organizer, DON'T VALIDATE your data disk. I found this out the hard way and lost a lot of work. It stores files as Random Access, and they are deleted if you validate the disk! Ernest Barkman of Orlando, Florida.

Great Advice! Also remember kids, don't ever validate a GEOS disk unless you are on the GEOS Desktop!



You may have overlooked a critical factor in your answer to Leslie Vakassian on page 22 of your April issue. I refer to the power supply! Power supplies furnished with the C64 are badly overloaded even when used with the "bare bones" computer. The overload gets worse if the computer is loaded with add-ons such as memory modules and the like. Furthermore, turning off the computer at the motherboard switch does not turn off the power supply. Therefore, the power supply overheats while in normal use and continues to build up heat while idling with the remainder of the computer turned off. It slowly cooks itself to death. If you have been around the C64 for very long, you know the power supply is a high-failure item. It is very likely the power supply for the C64, which was laid up for a protracted time, is suffering from dried-out electrolytics, if not catastrophic failure. Trying to run the computer on a defective power supply will kill every chip in it.

Don't overlook the power supply! William R. Phillips of Memphis, Tennessee.

If that's not the problem, check with the King of the Pumpkins. he may have a few ghosts and goblins running around loose in your machine

While we're on the subject, Master Software has a device that can save you from the perils of power supply burn-out -- The Chip Saver. Just \$5.95 + \$2.00 S/H to Master Software, 6 Hillery Court, Randallstown, MD, 21133. Or call them at (410) 922-2962.

I enjoyed the article on CP/M in March. I saw a similar article that discussed altering parameters... in CP/M (could have been CONF.COM). Neither that article nor the one in *dieHard* really explains how to go about changing this file to alter the perimeters... how to save it if changed, etc. I suppose all this is in the manual, though it seems very cursory.



I use CP/M only for one program, my genealogy program, PAF; but I would like to improve the performance since it is pretty slow. Maybe someone could write a more basic (very basic for beginners) article on using CP/M. Dick Estel of Fresno, California.

We hope that Mike is willing to get into more detail about CP/M at a beginners level, so everyone can get up to speed with CP/M.

A funny thing happened to me on my way to buy a PC.

A friend handed me a copy of your magazine, which he had picked up at a newsstand in Vermont. This was the same very good friend who, when he went over to Big Blue several years ago, sold me a 128, 1571, Magnavox monochromatic 80 column monitor and a Seikosha SP-1000 VC -- all for the princely sum of \$140.

My first encounter with *dieHard* prompted me to do four things:

1. Subscribe.
2. Postpone the PC indefinitely.
3. Order some of the software from one of your advertisers.
4. Embark upon the first letter I have ever written to a magazine editor.

I should mention that I got my **commodore** in time to catch the last year of *Run*, and *dieHard* strikes me as a big improvement, both in editorial content and in "personality" -- you guys do not seem to be working out of some plywood partition in a dark and neglected corner of a huge publishing enterprise. It is, of course, a delight to have again a source in which to find **commodore** related merchandise and services, but you seem to have gone well beyond serving such a basic function.

So, let me end my first and, most likely, only letter to an editor by thanking you not only for doing what you are doing at all, but for having a class act. Henry McGovern of Plattsburgh, New York.

We're glad you like us. We've got even bigger plans for our commodores, so stay with us!

READY.



Rarities

by R. Scott Herrar

User Groups

More additions and changes to our ever expanding list of active **commodore** user groups.

Arizona Commodore Users Group
(Input/Output)
P.O.Box 27201
Tempe, AZ 85285-7201



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BBS (501)224-9657

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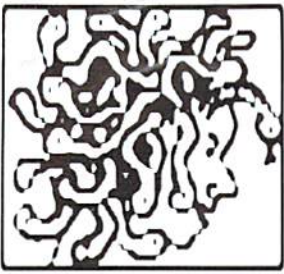
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READY.





R. Scot Derrer

Basic

This is a series of columns on the syntax and techniques of BASIC programming. This month is a look at the READ and DATA commands.

READING DATA

The BASIC commands READ and DATA are used together to perform a variety of tasks when manipulating data. The following examples will use string data, which can be graphic characters, letters, words, and numbers not used in mathematic calculations.

When you READ DATA in a BASIC program, you are reading a list of information. DATA is the list and READ looks at this list sequentially, one item at a time. The list may be long or short. The first example will demonstrate the reading of a list. Type in this program and RUN it.

```
10 PRINT CHR$(147)
20 READ L$
30 PRINT L$
40 DATA GHOSTS, WITCHES, GOBLINS
50 END
```

Line 10 clears the screen using the CHR\$ function with the value 147. A more in-depth look at the CHR\$ command will be in a later column. Line 20 is the READ command, which tells the computer to go to a DATA statement and read the first item or element in the list. L\$ is the string variable defined to contain the information obtained from the list of data. Line 30 says to PRINT the information in the string variable L\$. Line 40 is the list designated by the DATA statement. Notice the three words in the list are separated or delimited by commas. The comma lets the computer understand how to separate and identify multiple elements in the DATA list. The DATA statement can be any line number in any position in a BASIC program. I just happened to use the next to the last line. When you RUN this program, the word GHOSTS will print on your screen.

What about the remaining two elements, WITCHES and GOBLINS? Well, since this program only reads once, only the first element in the list is printed to the screen. Adding code to make this program run multiple times and read more

than once is easy. Simply add some LOOP logic. Remember FOR-NEXT loops? Try this next example.

```
10 PRINT CHR$(147)
20 FOR X=1 TO 3:READ L$:PRINT L$:NEXT
30 DATA GHOSTS, WITCHES, GOBLINS
40 END
```

Now all three elements are printed on the screen. Line 20 is a FOR-NEXT loop that executes 3 times. Within this loop are the READ and PRINT commands. For kicks, change the value 3 in Line 20 to 4 and reRUN the program.

?OUT OF DATA ERROR IN 20

Such a lovely and exciting error message, isn't it? Maybe not, but it does explain the problem rather well. It says that while READING DATA in Line 20, one of the READ passes resulted in a no data or invalid data situation being encountered. Well, sure it does. The DATA statement contains three elements and the READ statement is executed four times. The fourth READ found nothing so an error message is generated.

In running BASIC programs other than my own, I have occasionally encountered this error; and perhaps this has happened to you, too. Drives me nuts, but it is an easy error to correct.

Now let's combine this technique with the printing of a literal.

```
10 PRINT CHR$(147)
20 FOR X=1 TO 5:READ L$:PRINT "I LIKE TO
   BE SCARED BY "L$:NEXT
30 DATA GHOSTS, GNOMES
40 DATA WITCHES, FAIRIES
50 DATA GOBLINS
60 END
```

When you RUN this program, the screen display look like this:

I LIKE TO BE SCARED BY GHOSTS

BASIC



```
I LIKE TO BE SCARED BY GNOMES
I LIKE TO BE SCARED BY WITCHES
I LIKE TO BE SCARED BY FAIRIES
I LIKE TO BE SCARED BY GOBLINS
```

Line 20 now PRINTs a literal in front of the string variable L\$. Notice the DATA statements are now on separate lines with more data elements. Whether one or multiple DATA statements are used, the elements are still read sequentially. What if we want to display all of the literals on one line?

```
10 PRINT CHR$(147)
20 PRINT "I LIKE ";:FOR X=1 TO 2:READ
  L$;PRINT L$;:NEXT
30 DATA GHOSTS ,AND GOBLINS.
40 END
```

RUN this program and you should see "I LIKE GHOSTS AND GOBLINS". printed on the screen. Line 20 now PRINTs a literal and appends to that literal, via the semi-colons, the data found in the DATA list. Notice the blank space after the word GHOSTS and the period following the word GOBLINS. These are considered data and printed on the screen also. Remember, the comma separates elements on a DATA line.

Since we are dealing with string variable data, one might observe the absence of the quote symbol in the READ-DATA statements. This is one instance where using quotes with string data is not necessary because it is assumed. If you put quotes around the element data, it will not make a difference when the program executes.

```
10 PRINT CHR$(147)
20 PRINT "I LIKE ";:FOR X=1 TO 2:READ L$
  :PRINT L$;:NEXT
30 DATA "GHOSTS ", "AND GOBLINS. "
40 END
```

There are many more aspects of the READ-DATA combination to learn about. Next month, we'll continue in that direction. Until then, Be Seeing You. And I didn't even crack a Star Trek NG joke.

READY.



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REVIEW!

Back To The Future Part II

KONAMI INC.

review by: Noel Plank

With a blinding flash of light, an almighty clap of thunder, and a not-so-spectacular clatter of trash cans, the ice-covered De Lorean appeared out of nowhere at exactly 88 miles per hour. It buzzed the quiet street and came to a screeching halt in Marty's front yard.

"Marty!" Doc shouted, running toward him and grabbing him by the shoulders. "Marty! You've got to come back with me!

"Come back to where, Doc?" Marty asked with a puzzled expression.

Doc whipped off his mirrored sunglasses. "Back To The Future!" he cried. He ran over to one of the toppled garbage cans and frantically pulled out some empty cola cans and banana peels and dropped them into the rear of the De Lorean marked "MR. FUSION HOME ENERGY REACTOR."

Doc pulled Marty and Jenifer into the De Lorean, then jumped into the driver's seat and reversed out onto the street.

"Hey Doc, you'd better back up, we don't have enough road to get up to 88," Marty pointed out as the car stopped.

"Roads? Where we're going, we don't need roads," Doc exclaimed. With that, the De Lorean launched into the air as the four wheels slid under the chassis. After hovering a few seconds, it burst forward with a roar and accelerated to 88 miles per hour, then in a flash it was gone!

BACK TO THE FUTURE II has five separate levels that tell a chapter of the story, with you guiding Marty McFly. If you've seen the movie, you have some advantage because each is based on a specific scene from the movie.

After seeing a great graphics scene of the De Lorean disappearing in a flash while playing the BACK TO THE FUTURE theme song, you find yourself guiding Marty through the streets in the year 2015 on a hoverboard. You must avoid Griff and his gang, also on hoverboards, as well as other obstacles such as dogs and oil. Don't get run over by the taxi, but grab onto the rear for a free ride.

Level 2 finds you controlling the younger Jenifer in the Hilldale house. The object in this level is to get Jenifer out of the house without bumping into any of the computer controlled occupants. If it happens, she will suffer severe damage to her nervous system and unravel the fabric of time itself. This level is basically a logic puzzle where you must memorize which directions open which doors and look ahead two or three moves in order to avoid a tragedy of fate.

In Level 3, Hill Valley of 1985, the objective is to defend yourself against thugs armed with frisbees, rope, trays and rocks. When you knock one of these dudes out, he'll drop his weapon. You can pick it up to keep him from using it again, but look out for bouncing tires, falling rock, jets of steam and rolling barrels.

Level 4 takes you to the high school in 1955 to get the sports almanac from Biff before he can do any damage with it. The objective

here is a "sliding block" puzzle where the idea is to slide the tiles in the correct order to make a complete picture before time runs out. In this case, the picture is Marty playing guitar at the dance.

In Level 5, still in 1955, Marty is tailing Biff's car through Hill Valley on his hoverboard and must retrieve the almanac before Biff reaches his destination. Marty must fight off various enemies, including old Biff, Biff's henchmen and the Hill Valley police.

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REVIEW!

Back To The Future Part III KONAMI IMAGE WORKS

reviewed by: Noel Plank

Great Scott! Doc's flashed himself back to 1885 into the arms of his future bride, Clara Clayton, and right into the hands of Hill Valley's most vicious varmint, Buford "Mad Dog" Tannen. Marty has learned that Doc is just a few days away from being deep sixed. So saddle up the De Lorean and bring Doc back to the future before he makes a no-return ride to Boot Hill. Now it's up to you, in the roles of both Marty and Doc Brown, to save the day and return everyone safely to their own time.

BACK TO THE FUTURE III is split into four levels of play. Each level represents a scene from the movie.

Level 1: *The Buckboard Chase*

The object is to reach Clara before the buckboard reaches the edge of the ravine. You're Doc, on the horse, and you start out behind Clara on the buckboard. The horse gallops automatically; however, you can pull back on the joystick and make him jump over bouncing luggage falling out of the buckboard, or control Doc by making him duck under high flying packages. ("Hmm, I don't remember that from the movie?") Anyway, at first you see a colorful 3D view of the rider as you listen to a catchy tune of "Ghost Riders In the Sky" and galloping hooves as background mountains move against the sky. After jumping your horse over several ravines, you find yourself in an overhead view of the buckboard pulling away from the rider. You must steer around rocks, sides of the ravine and shoot at the Indians on the edge of the cliffs, but you're not supposed to shoot the cavalry. After you get knocked off the horse countless times and master the game's objectives, you find yourself in Hill Valley where a bank robbery is under way. Buford and his gang are cornered by the army, so you must avoid bullets and shoot the bad guys while looking out for obstacles on the ground.

Level 2: *The Shooting Gallery*

In this level, the object is to shoot as much as you can as quickly as you can. You're shown a hand reaching out in front of you with a gun in it, and you must sight down exactly where you are aiming. You can't run out of ammunition, but you must watch the clock because when your time runs out, Buford appears and ends the game. The targets include scrolling ducks at the bottom as well as flying ducks which move much faster. For more points, look for cardboard cut-outs of Buford's gang which appear from doorways and windows; but don't shoot the old ladies.

Level 3: *Pie Throwing*

Buford's gang is hidden around the Hill Valley square, of which you're given an aerial view. As the bad guys appear from the doorways and windows as well as the saloon roof to shoot, you must defend yourself with a pile of pie trays in stacks of ten. To throw them, you must position Marty and hit the fire button on your joystick. The only other protection you have is to grab an old oven door; but if it gets hit too many times, it breaks open, revealing Marty's heart. The next shot is fatal.

Level 4: *The Train*

You are Marty on top of a railcar. As you move forward on the rooftops, you collect Doc's special speed logs to push the train up to 88 mph. Finally, you must get to the De Lorean at the front of the train before the time runs out. As you make your way forward, Buford's gang as

well as the train engineers appear and confront you. You have more pie trays to throw at the bad guys; and if they get too close, you can either punch them out or crawl under their legs. While all this is going on, you must watch out for mail hooks, water towers and signals; and either duck or jump over. If you get knocked off, you will be brought back aboard the train by your hoverboard and you can climb back on the carriage ladders. When you finally make it to the engine, you must avoid the jets of steam which can knock you off; then jump down onto the De Lorean at the front of the train, and it's back to 1985.

Conclusion:

As you can see, this version does not follow the movie; and there is a lot more repetitive action than Back To The Future Part II, even though 3D graphics and catchy sound do make it entertaining. My suggestion: If you are a real Back To The Future fan, you might want to save your money and visit Railtown 1897 at the Sierra Railway Depot, Fifth Avenue, Jamestown, California 95327 and see the real Sierra Railroad Number 3. Built in 1889, it weighs 55 tons and played roles in movies such as The Virginian in 1928, Union Pacific 1939, High Noon, The Moon Lighters, Silver City, Cimarron Kid, Rawhide, Lassie, Petticoat Junction, and, of course, Back to the Future Part III. It can be rented, too, at only \$6000 per day. You can even take the Keystone Special, a two-hour steam train through the Mother Lode, which takes you to the actual movie location of Hill Valley 1885.

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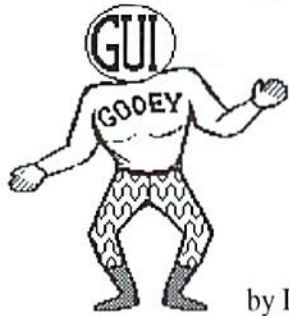
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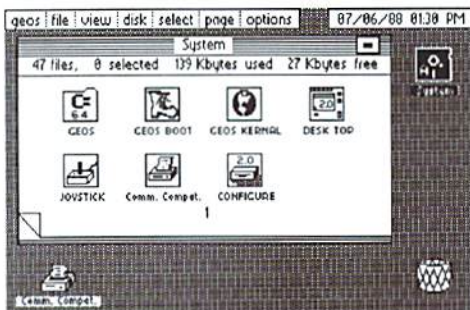


Getting Started in GEOS

by Dale Sidebottom

Walk Around the Desktop

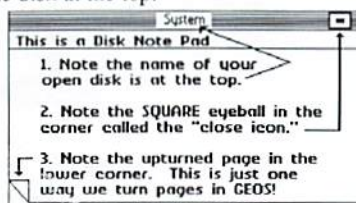
At the end of Part I, we had just completed the GEOS installation process. When you boot up GEOS 64 2.0 for the first time, you will see a desktop on the screen that looks exactly like the one shown here. *The GEOS 128 desktop will be slightly different.* Be certain you have put write-protect tabs on your System disk to prevent any accidental damage to it.



This is a good place for us to stop and look around our new "desktop." Notice a box in the upper-right corner shows the wrong time and date. Move your arrow-pointer over the box and click, type in the correct date and time, then hit RETURN. GEOS will now keep time for you until you turn it off!

Over to the left is the command bar. The seven choices you see there are just the "tip of the iceberg." Click on each option and a sub-menu will drop down offering even more choices. Pay particular attention to the one designated as "disk." Click on it and look at all the disk utilities that are yours at the touch of the button!

Under this command bar is the note pad, like you might see on a desk in any office. However, this is a *disk note pad* with the name of the disk at the top.



Now look in the upper-right corner of the note pad, and you will see what appears to be a square eyeball. It is the "close" icon. Click on it and the "System" disk will close. The note pad goes blank. Now move your arrow-pointer further to the right off the note pad to the disk-shaped icon. It has a question mark on it and the words "DRIVE A" under it. Click on the drive A icon and the disk will open up again. Close and open the disk again. Notice that when you close the disk, you do not hear the disk drive run at all. Therefore, I consider closing a disk *from the GEOS desktop* to be redundant, and I do not waste time with it.

On the desktop are seven file icons representing the first seven files on your disk. How many programs are there, you may ask? Look at the answer on the line above the icons. There are 47 files, 0 are selected, 139 kilobytes of memory are being used, and 27 kilobytes are still free.

Down in the lower-right corner, you will see the wastebasket. That's where you throw your files away when you are done with them. To the far left of that is the printer icon. The area between the wastebasket and the printer icons is very important. It is called the *border* area. This is where you place files if you want to change them from one page to another on the note pad or need to transfer them from one disk to another using a single disk drive.

Above the printer icon, you can see the corner of your notepad is curled up, as if you were ready to turn the page. Do that. Click on the up-turned corner there; and indeed, your note pad will turn to page 2. Click on the corner below it, and the page turns back to page 1. Flip through all seven pages of your SYSTEM DISK. A even easier way to turn pages is to simply press the number keys. Try that a couple times, then return to page 1.

Having Fun Handling Files

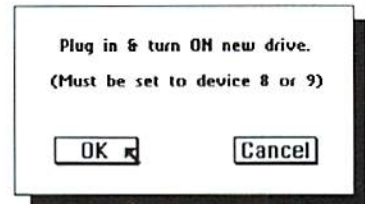
GEOS handles files in an interesting way. Looking again at the disk note pad on page one, click on the seventh file icon named CONFIGURE (128 CONFIGURE on the GEOS 128 desktop) and it will be highlighted (selected). Move the pointer away from the icon and click again. The file icon is back to normal (deselected). Again put the pointer on the

CONFIGURE icon and click, then pause, then click again. *It's a ghost!* Actually, it's a ghost icon. With your joystick, you can now move it around the screen. When you click to drop it on the note pad, it disappears. (Well, what did you expect from a ghost!)

Now click on the CONFIGURE file icon again; then hold down the <C=> key while you click on the joystick or printer file icons. You have successfully selected two files at once. Now *release the <C=>key* and click on a *highlighted* icon. Wow, you can now see a Multi-File ghost icon. In this way, GEOS allows you to select several files at one time! Click again to bring them back to normal.

Now let's open a file! Put your arrow-pointer over the CONFIGURE icon. Double-click now, twice in quick succession. This is the easiest way to open a GEOS file.

You will soon see, in the top half of your screen, two large squares. Drive A is on the left, and drive B is on the right. Notice that drive A shows up as a 1541 or 1571, depending on which you are using. Under drive B, click on the box corresponding to the drive you want to turn on. Today, that should be a 1541 or 1571. Now you will see the dialog box below, telling you it's time to turn it on. Notice it must be numbered device #8 or #9.



Now we need to get back to the desktop. To do this we quit the program (application) we are in. Move the pointer to the word *file* in the command bar at the top. From the sub-menu, select *quit*. Soon you will be returned to the desktop.

Making Back-ups and Work Disks

First, you will need to format your blank disks. Put a blank disk into drive B. *[If you have only one disk drive, ignore all references to drive B and use drive A instead.]* Click on drive B. You will get an error message telling you that you have a missing or unformatted disk. You already know that, so click *OK* and watch a

AT GOOEY -- PART II

question mark appear over the drive B icon. Move your arrow-pointer to the command bar at the top and click on *disk*. Then select *format* from the bottom of the sub-menu. (The shortcut is <C=><F>.) The next dialog box will ask you to name your disk; then hit <RETURN>. All six disks must be formatted and named. For example, if you might name them as follows:

<u>backups</u>	<u>work disks</u>
WriteUtil.Backup	gWrite.1.WorkDsk
GeoSpell.Backup	gPaint.1.WorkDsk
Appcatns.Backup	Paint/Write.WD.1

If your blank disks have been regularly formatted already, you can shorten the process. After clicking on drive B, a dialog box will say, "This is a Non-Geos disk. Convert it?" You can click on *YES*, and it is changed to a **GEOS** disk in a few seconds. You can rename the disk just as easily. Move to the command bar at the top, click on *disk*, and then select *rename* from the sub-menu. (The shortcut is <C=><N>.) Change the name and hit <RETURN>.

The Final Phase

You are now ready for the final phase -- disk copying. Put **WRITE UTILITIES** (Disk 3 Side A) in drive A, and open it. Then double-click on the **geoMerge** icon. Wait several seconds until a dialog box says "geoMerge installed." Now let's make a backup copy of this master disk.

Move your arrow-pointer to the command bar at the top, click on *disk*, and then select *copy* from the sub-menu. (The short-cut is <C=><K>.) A dialog box will ask you to put a disk in drive B. Put the WriteUtil.Backup disk in drive B and click *OK*. The second dialog box will ask you to, "Replace the contents of WriteUtil.Backup with the contents of Write Utility?" Click on *YES*. The arrow-pointer will return to the screen when the copying has been completed.

[If you have only one disk drive, **GEOS 128** will recognize it and give you directions accordingly. **GEOS 64** will require you to find the **DISK COPY** program on page 2 of the **SYSTEM** disk. Open it up and follow directions to make copies.]

Next, put **GEOSPELL** (Disk 3 Side B) in drive A and open drive A. Double-click on **geoSpell** to install it. Then copy this master disk as you did the last one, using the **GeoSpell.Backup** disk in drive B.

Last, put the **APPLICATIONS DISK** still in drive A, open it, and install the **geoWrite** application. Then copy the **APPLICATIONS DISK** to ALL FOUR remaining blank disks. Why? Because in my opinion, it is easier to make work disks by copying an entire disk and then throwing a few files away, rather than to make a work disk by copying one file at a time.

When the **Appcatns.Backup** disk and the three work disks have been copied, put the **gWrite.1.Workdsk** in drive B and open it. Throw away the **geoPaint** on page 1 by making a ghost icon of it and dropping it in the wastebasket. I would also throw away the **calculator** and **note pad** files on page 2.

Repeat this process with the **gPaint.1.WorkDsk**, except that you throw away the **geoWrite** file instead of the **geoPaint**. I would also throw away a couple of fonts on page 3. The same is true of the **Write/Paint.WD.1** in **GEOS 64**, except you must throw away the **DESKTOP** instead of **geoWrite** or **geoPaint**. In **GEOS 128**, you will have to throw away the **calculator** and **note pad**, plus the **University** and **Cory** fonts on page 3 to free up enough space to make a work disk.

You now have three work disks, one for word processing, one for graphic design, and another for combined projects. If you need more (and you will), you know how to make copies. But be sure to use work disks only to create data files, not to store them. It is advantageous to have storage disks available for your finished files. This will keep space free on your work disks for new projects.

If you are a budding power user and own a 1571 or a 1581 as a second disk drive, you can make larger work disks. **GEOS** has no problem copying from a single-sided to a double-sided 1571 disk. However, 1581 users will have to click on *select* from the command bar and then on *all pages* from the sub-menu. (The shortcut is <C=><W>.) This will allow you to select an entire disk. Then click on any highlighted file icon and a Multi-File ghost icon will

appear. Drag that ghost icon to the drive icon you are copying to (probably Drive B) and drop it. This allows you to copy across unequal drives.

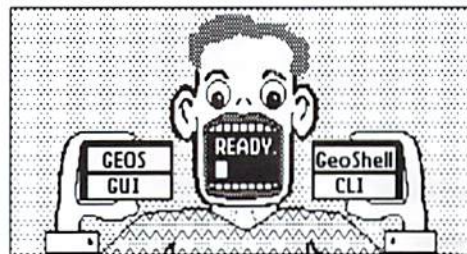
Well, the final phase is finished and that's it for Part II! Have I taught everyone how to operate **GEOS**? Not exactly. What I hope we have accomplished is to plant a seed and nurture a slender stalk. It will now be your happy task to develop the branches.

I recommend that you check out the **preference manager** and the **color pad manager** on the **SYSTEM** disk. You may want to reopen the **CONFIGURE** file and even save your configuration. These operations will require you to take the protection tabs off your **SYSTEM** disk, so you can store permanent changes to it. Be sure to replace these write-protect tabs immediately afterwards. You may want to check pages 3-6 and test one or two printer drivers you will find there. You can transfer them to your work disk by making a ghost icon, then drop it on the appropriate drive icon.

I also recommend reading the manual. The **GEOS** manual is a good one, on the whole, and your familiarity with the **GEOS** terms introduced here should make it much easier to understand.

The final question is, and I know someone is going to ask it -- *What happens if I do all this and discover that **GEOS** is a terrific program with powerful options, but find I still hate GUIs? What then?*

Well, my friend, you are in luck. Maurice Randall has produced a superbly written CLI (Command Line Interface) called **geoShell**. It allows you to access everything available within **GEOS**, without getting gooey (unless you want to)! The terrific thing about **GEOS** today is that we can have our cake and eat it too!



Archaic Computer

The Computer Store Of The Past

introduced by Brian L Crosthwaite

After I got my datasette in 1984, I decided I needed a graphics enhancement package. I waited for the ISU bookstore to get LOGO. I was bummed to find out it was on disk and not a cartridge. I went to a store called Armadillo Brothers in search of Commodore graphics. They showed me Turtle Graphics II and Simons' Basic. I liked the

idea that Simons' BASIC was a basic extension, so I purchased it. Later I thought I should have gotten Turtle Graphics II, because I could use the graphics without the cartridge -- or so they told me.

Well, after experience with both, I can tell you, I made the right choice. That is why you see PRG from time to time that

supports this programming language. And the price is right. Most places that carry it sell it for around five bucks! For more info on Turtle Graphics II, see the July '92 issue's *Archaic Computer*. In the mean time, journey back with me into that golden moment in computing, here in the Computer Store Of The Past.

SIMONS' BASIC

by David Simons

1983 Commodore Business Machines

reviewed by Brian L Crosthwaite

This was one of the first ventures I had ever set out on with my Commodore 64. There are some things that just don't work like they were intended, like sprites -- your program will vanish from memory after the program runs. (Check out that mem isn't reset) Subroutine calls fill memory faster than GOSUBs. So much more, so that using more than just a few will fill your computers memory and crash your computer.

Within the confines of this review I'll cover many of the features that work as well as let you know some of the limitations and flaws of others. For instance you can RENUMBER, but GOTO and GOSUB references do not get renumbered. A new version was released on disk, but it didn't get out in the US. It was released in England and possibly Europe. It reportedly had all the quirks fixed.

This cartridge is packed with 114 new BASIC commands and functions.

Let's start with the graphics commands -- that's why I bought the cartridge in the first

place. Getting your C64 in the high resolution graphics mode is as easy as issuing the HIRES command. HIRES foreground color, background color is the format. Multicolor mode? Issue: MULTICOLOR1,color2,color3. This will give you a HIRES or MULTICOLOR HIRES graphics area and allow you to use commands like LINE, BOX, CIRCLE, BLOCK and others. You now have two HIRES areas. While you can't use the new commands in the old HIRES area (8192), you do have two separate areas. This gives you ease of two screens with little effort on the behalf of the programmer.

HIRES, MULTI, COLOUR, LINE, PLOT, ARC, BOX, CIRCLE, BLOCK, DRAW, ARC, ANGL, PAINT, ROT, CHAR and TEXT are some of the many graphics commands that Simons' Basic offers.

The format is much the same for most commands:

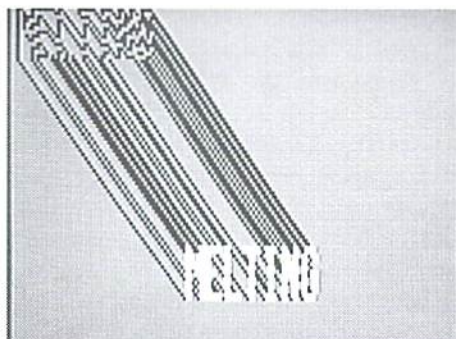
command X,Y,X2,Y2,PT

X and Y are your coordinates on the HIRES screen. X2 and Y2 are either a second set of coordinates like those used in the LINE command to draw a line from X,Y to X2,Y2, or radii for circles and so forth. The ARC command allows you to place arcs on the screen where you can control the start and end angle as well as the X and Y radii. ANGL will allow you to draw part of

a circle. You can see that the extension of BASIC covers a lot. Most BASICs that use a CIRCLE command allow you to use one command to do all three of these things. Of course the CIRCLE command can get pretty hairy in some cases, whereas Simons' Basic decided to keep things simple.

PT is the plot type. This is, for the most part, color. 0 is the screen color and 1 is the pixel color in HIRES mode. 2 will unplot if there is a dot or plot if there is not a dot. You can actually draw lines using LINE where it will unplot on any graphic on the screen while plotting on the screen where no graphic exists! In MULTICOLOR mode, plot type works a little different. 0 is screen color, 1, 2 and 3 are plot colors and 4 will swap the plot color. If the background is 0, it plots color 3, if it is 3 it plots 0. If the background is 1, it plots color 2, and if the color is 2, it plots 1.

CHAR and TEXT will plot text anywhere on the screen. It works the same as any other graphic and, rather than being limited by the 8 x 8 square like other Commodore graphic languages like BASIC 7.0, you can plot at ANY coordinate! The text spacing can be altered as well as the height. Some amazing effects are possible. See screen shot next page of XORed HIRES text.



Sprites can be programmed, and character sets defined. They can be easily manipulated with many new commands that replace the POKE and PEEK method. Text can easily be scrolled in any direction in pre-defined chunks of screen. They are both defined and drawn right in the program so you can see them. The only thing I found to be a draw back with using sprites was that the program moved into memory somewhere, or was erased altogether. In either case, the program was lost and could not be worked on after it had been run once. This did not happen to the character set.

Structured programming enhancements allow you to name subroutines, and use REPEAT and LOOP with EXIT IF, END LOOP and ELSE. You can even reset the next data pointer to any desired DATA statement.

Examples of other commands include PENX and PENY to read the coordinates of a light pen. POT for reading a paddle and JOY for reading joystick input are included for game and input programming.

Music and sound can be set up easily with the VOLUME, WAVE and ENVELOPE commands. MUSIC and PLAY will play strings of music -- like most BASICS that use these, they are not so easy to set up.

KEY will allow you to define 16, yes, that's 16 f-keys! DISPLAY will list them to the screen for easy identification.

AUTO will print line numbers for you while you enter a program, one of the most used commands. RENUMBER, on the other hand is virtually useless, because while it will renumber your program, it will not renumber the references in GOTOS, GOSUBs THENs and so forth. This can cause a real headache. MERGE, on the other hand is a real gem. It allows you to merge two or more programs together in the computers memory. But then, if you need to renumber the newly merged program that could be a problem. Other than that, it works like a champ.

Another nice programming feature is the FIND command. This will allow you to find just about any part of you code you wish to. For instance, let's say you want to find all references to GOTO1000. Type: FIND GOTO1000 <RETURN> and the computer will list all line numbers to the screen that contain GOTO1000. DUMP, another one of my favorites, will dump all variables and their contents to the screen.

You can make lines of code invisible with DISAPA and SECURE for those who wish to hide code.

Oops, typed NEW before I saved! No problem! OLD saves the day. This one is a real



winner!

There are a lot of string manipulation commands, like INSERT, PLACE, DUP and INST, but I think the most useful are AT and USING for printing at a specific place on screen and formatting how your print to screen looks. AT will place text anywhere on the screen, while USING allows you to place columns of numbers with decimal points all lined up, with a specified number of digits after the decimal.

Input can be controlled better with the FETCH command. You can define all valid entry characters, such as numeric or unshifted alpha only. INKEY checks for f-keys only. While ON KEY works like the ON command, except that it will look for a key listed in a string and do the GOTO from that key's position in the control string.

There are a lot of numeric aids. Converting binary to decimal and hexadecimal to decimal is simple. FRAC will return the fraction portion of a number, while the INT

function will return the integer part of a number.

DISK gives you access to the disk commands. The syntax is the same except instead of typing OPEN15,8,15, you type DISK. DIR"S will give you a directory that lists to screen memory rather than erasing any BASIC program from memory. However, the listing cannot be stopped and will continue until the entry directory is listed out. You can use wild cards to control what programs you want listed just like the old style of LOADING the directory into BASIC.

The cartridge allows you to set up your own error trapping. This gives you not only more debugging power, but allows you to write your own error messages. Rather than seeing SYNTAX ERROR IN 500 you can print HEY, LEARN TO SPELL!

As you can see, the list of commands just goes on and on.

This is one of my favorite pieces of firmware, so I want to give it a perfect score of five stars. However, the PROC (calls a subroutine by name) command eats memory like crazy, making it impractical to name more than a few subroutines, and even at a minimum, when it calls the same routine the count continues and memory gets eaten up. Programming sprites becomes a hassle when every time you run the program, you know it will be purged from memory. Thus, this one gets a:

*** * * * * FANTASTIC!**
*** * * * * GREAT**
*** * * * * GOOD**
*** * * * * POOR**
*** * * * * REALLY BAD**

READY.

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Collector's Corner

by Gil Parrish



From the earliest days of personal computers, there was the storage problem. Obviously, home systems needed a device to save and retrieve programs; but disk drives were VERY expensive back then, so many users turned to ordinary cassette recorders. Those were cheaper and got the job done; however, they had limitations because they had not been designed for computer work. (True, **commodore** built the Datassette specifically for use with **commodore** systems, but the Datassette at heart was very much an ordinary cassette recorder). Tape moved at a leisurely pace (about 1-7/8" per second) which limited how much data a tape could transfer in a given time no matter how efficient the recording scheme. Also, the computer had no idea what programs might be on a tape or where, and no idea what part of a tape it might be reading at a given moment; the chore of keeping track of those matters was entirely delegated to the user. And the computer had minimal control over the recorder: if PLAY or another movement button was manually pressed, computers like the **commodore** could pause or restart the tape, but could not shift from FAST FORWARD to PLAY and so on.

Eventually, the light bulb went on over someone's head -- why not design a tape unit specifically for use with home computers? Such a unit might improve performance but still remain cheaper than disk drives. So, around 1978, a company called Exatron Corporation, out of Sunnyvale, California, introduced the *stringy floppy* drive, originally for use on TRS-80 systems. The Exatron ESF 20/64 arrived for VIC and C64 use in early 1983.

If you find one today, you will discover the ESF 20/64 is a small box, about one-third the size of a 1541, that has no tape control buttons. It is daisy-chained through the serial port like a disk drive, and is also addressed like one (but as Device 20). Unlike a disk drive, it uses tapes called *wafers* which are extremely small (1-3/16" x 2-3/4", about three credit cards thick) and which contain 4K to 64K of storage room. The tape itself, just 1/16th inch wide, 5 to 75 feet long, and wound in a continuous loop (sort of like an old eight-track audio tape), always moves in the same direction (never

rewinds). The tape has a small metal band at one point so the computer can identify the start of the tape.

The drive keeps a directory for your convenience but does not use that to find programs. When a load is requested, the drive speeds the tape forward, slowing down at the start of every program it finds to read the header. It will load the right one upon locating it and do so at a speed equivalent to a 1541. Saves are a bit more complicated: unless you want to put the program immediately past the metal band (SAVE "FILENAME",20) you must prod the tape into a blank spot just after the last recorded program (usually accomplished by doing a verify of that program) before saving (SAVE "#FILENAM",20).

The unit had a clear price advantage over disk drives, being about \$200 at a time 1541s were \$375 or so and Datassettes were around \$75. But the speed advantage over ordinary tape drives was somewhat illusory. Since the drive had to search the whole tape for a program, search time was dependent on the length of tape and exactly where the tape happened to be when a search started. Search time for a 16K wafer could be about a minute, so if a load instruction was given when the tape was just past the desired program, the device would waste almost a minute merely getting back to the right spot.



Another difficulty was the reliability of the wafer itself -- that continuous loop arrangement caused considerable tape wear. (Indeed, the Coleco ADAM was originally supposed to be equipped with a stringy floppy drive, but reliability problems led that manufacturer to install a Digital Data Drive -- essentially, a speedy and intelligent cassette drive -- instead.)

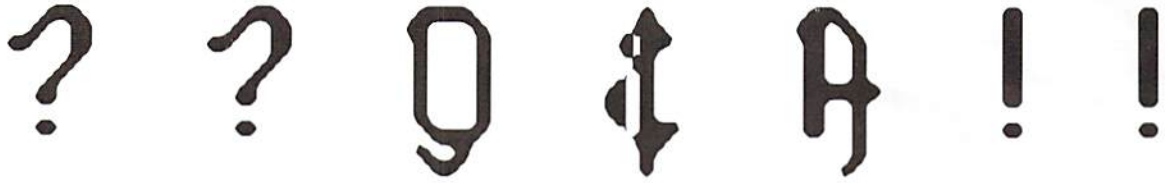
For a while, Exatron (which underwent a name change to Entrepo at some point) dropped

out of direct sales of stringy floppy units; it continued to build the basic drive assemblies, but other firms like A&J Microdrive and Unitronics finished the assemblies under their own names. Yet the company was back in direct **commodore** marketing in late '84/early '85 with a variant called the Quick Data Drive (QDD). This model, connecting to the cassette port and addressed like a normal tape drive, was very small (2-1/4" x 3-1/2" x 6"), yet could take larger wafers (up to 170K), and was faster -- able to search a 25K wafer in eight seconds, or able to load a 24K program in 20 seconds (compared with almost eight minutes for a cassette drive and perhaps a minute for a stock 1541)! All this, and the price was down to \$85. Given the announced \$8 million Entrepo spent developing the QDD, the company must have expected to sell hundreds of thousands, if not millions, of the units.

It didn't work out that way; a number of factors conspired to kill the QDD. Wafer reliability remained one problem; another was the continuing failure of commercial software producers to market titles in a stringy floppy version (although Entrepo tried to make some titles available). Yet another difficulty was conflict in memory management: the QDD used a Quick Operating System (QOS) loaded into memory (or plugged in by optional cartridge) to make QDD operations easy, but the QOS could interfere with machine language programs trying to use the same memory area. In any case, the final nail in the coffin was undoubtedly the dropping cost of disk drives. Disk drives retained a number of advantages over the stringy floppy (convenience, random access, etc.), and through various techniques (like a fast load cartridge or Jiffy DOS) could maintain a speed advantage. When disk drives became popularly priced, the market for tape drives of any kind evaporated. And so, apparently, did Entrepo. As nearly as I can tell, the company did not survive past 1986, but its little devices live on as yet another strange niche in the history of personal computing in general, and **commodore** computing in particular.

READY.





Q: I have a C64 and a 1541 disk drive. What I want to know is if the Apple Image Writer II printer can be used with the equipment I have. Louis Dimas of New York, New York.

A: Yes! GEOS and The Write Stuff would be excellent starts with this printer. Many other programs would also be able to utilize the Image Writer. Make sure you have the proper printer interface.

Q: In the Nov'93 issue in The Archaic Computer Q&A, you mentioned having a reset switch installed in a C64. Can you advise how to do it or advise to whom I may write to ask? Ron Mullins of Huntington, West Virginia.

when I use the program with my 128D and a separate 1581 disk drive, but it won't work properly when I use the 128D's built-in 1571 disk drive. I am able to load the program with the built-in 1571 disk drive and access existing files but can't format MS-DOS disks or copy files to an already formatted MS-DOS disk. My disk drive just locks up and the light flashes. When I tried using the same program on a friend's 128 and separate 1571 disk drive, it worked fine.

This leads me to believe that my 128D or its built-in disk drive is somehow preventing Big Blue Reader 128 from operating the same as it would on a 128 with a separate 1571 disk drive. I also have

run all right, then you might want to check out either your alignment or the possibility that your drive rails are dirty. There are public domain programs to aid with alignment checks. If you are uncomfortable with opening up your computer, there are several **commodore** service centers advertised elsewhere in this magazine. Remember, if you take apart your computer, you void any warranty you might have on it.

As far as the chips in the 1571, the C128D's drive has the latest chip set that Commodore released for the 1571 drive. You may want to check that the drive is in 1571 mode. On a blank line enter: OPEN15,8,15,"U0>M1" <RETURN>. Then type: CLOSE15 <RETURN>. If the drive does not have a disk

in it or has an unfomatted disk in it the drive light will flash, just type: ?DSS <RETURN>and it will stop. The drive will be in 1571 mode.

The 1571 cannot format an MSDOS disk unless it is in 1571 mode.

Q: I purchased a C128 system used. With it came many hardware items, one being the EPYX FASTLOAD cartridge for the C64 and another is ACCESS's MACH 128 cartridge. Documentation did not accompany the units. I've been searching through many years of supporting magazines for a review, to no avail. I need help understanding the usefulness of these cartridges.

G.M. Walter, Jr. of Richmond, Virginia.

A: There was a review of the Mach 128 cartridge in the March 94 issue of *dieHard* that would probably answer some of your questions about cartridge capabilities. The Fastload cart speeds up program loading/saving but doesn't have many of the utility features of the Mach 128.

You might place an ad in *Trader's Corner* for the manuals you are missing. Want ads are free, see page 33 for more information.

Q: In the November issue, the comments in the NEWS section about the C65 were thought-provoking but did not answer a most important question. Is it compatible with **GEOS**? Larry Vickers of Prichard, Alabama. --- DSB

A: We have not yet received our C65 from The Grapevine Group yet, so we don't know for sure, but reports from most fronts are "NO."

Q: I just got started reading the December Flyer. The short Reader Input article on page 6 by Walter Schroeder on the Fun Graphics Machine was interesting. I would appreciate it if you could tell me where to purchase it. Also, are there any sources you know of except the radio amateur stores that have programs for radio amateurs. Brooks Blanchard of Wauwatosa, Wisconsin.

A: For information about the Fun Graphics Machine write or call: The FGM Connection,



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C-64

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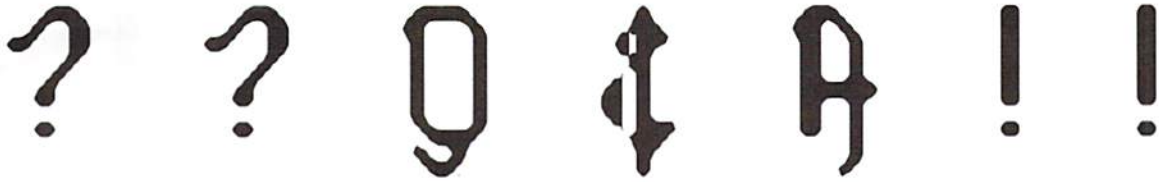
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Library, PA 15129

A: Your local user group would be a good start. There is usually someone in every user group handy with a soldering iron. In the meantime *dieHard* will soon be starting a new column that will cover this topic and more!

Q: I have a program called Big Blue Reader 128. I am sure you've heard of it. It works fine

another copy program called Fast Hack 'Em that my computer will not allow me to use. Do you know of any internal chip for the 128D or its built-in disk drive that might prevent me from using these programs properly? If there is, what chip is it and where can I find one? Michael Hackman of Baltimore, Maryland.

A: If these programs used to



P.O.Box 2206, Roseburg, OR, 97470 (503) 673-2234.

As far as Amateur Radio goes, check with your local **commodore** user groups as well as the local amateur radio clubs. Quite a lot of amateur equipment is still being run on **commodore** systems. Anyone with any Amateur Radio info concerning use with the C64 is welcome to drop us a line for a future *Rarities*.

Q: I would be more than happy to subscribe to your *dieHard* publication if you can tell me what I need to do to make my C64 work right again. I have called several area service places and found most of them quite curt or rude when I asked for a **commodore** service place or some simple advice on how to clear up my problem.

The problem is that it only shows "out of memory error in 0" on the screen and won't run a program. It just keeps going on and on, won't stop, and has several exclamation marks through the screen. I fear I may lose what I have on my disks if I try to keep getting it to work properly, by not knowing how to correct the problem. If it needs a reasonably priced service repair, I can handle that. I just hope I can get it back "in service." Can you help? Mrs. Lonnie Freeman of Manito, Illinois.

A: Sounds like you have a bad chip, (or several) quite possibly a 4164. Check out the Tech Star, Computer Bargain Store, and Sodak Electronics ads elsewhere in this issue for

commodore repairs. Any reputable repair center will warrant their work. Don't hesitate to ask, "How much?" Many places offer a flat fee.

Q: How long is the life of a MPS 803 printer ribbon (printing four pages of spreadsheet data once per week)? Does the ribbon travel through the cartridge more than once? Where can I obtain auxiliary sprockets for this printer?

I have a disk that accompanies the 1541 drive. If I LOAD it with a standard "*" ,8, there are a series of procedures that are promised (such as the printer test, etc.). I can get the promises but I cannot get the tests themselves to perform. Can you tell me what to do to make the disk deliver what it promises?

Are there any subscribers to *dieHard* in Skokie, Illinois (zip code 60076-2453)? Maybe he/she/we can form a user group of our own with the hub being *dieHard* magazine?? Paul Silverman of Skokie, Illinois.

A: The MPS-803 ribbon life is over a million characters (1.2 million). If you are only printing 4 pages a week, your ribbon should last quite awhile. V-Teck, 2223 Rebecca Dr., Hatfield, PA, 19440 carries ribbons for the 803. If you are looking for parts, you might call some of the advertisers in *dieHard*.

The Test/Demo disk that comes with the 1541 drive has some instructional program files at the

beginning of the disk. When you LOAD "*" ,8 the disk drive looks for the first program in the directory. To get at the directory type: LOAD "\$" ,8 and when the READY prompt appears, type LIST. You should see a list of the files on the disk. If the listing goes by too fast, hold down the CONTROL key to slow it or press the RUN/STOP key to terminate the list. To load a specific program from that directory: type LOAD "filename" ,8 -- where *filename* is one of the names you got from the directory listing. When the READY prompt appears, type RUN.

Check *Rarities* for user groups in your area. The last

couple of issues have had lots of new ones entered.

READY.



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DOS & NonTs

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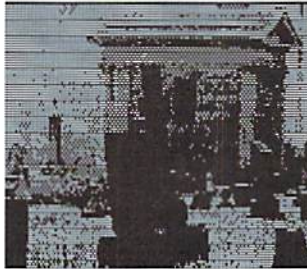
The Directory in Depth

by James Gregory Welier

Part B: The BAM block

The BAM (Block Availability Map) block is track 18, block 0 of your 1541 disk. It has three main parts: (See map 2: the BAM.)

1. Directory link
2. BAM
3. Disk name and ID.



Section 1: Directory link.

The first two bytes of the BAM block contain the numbers of the track and block where the disk's directory starts. Whenever DOS wants to find something on the disk, it starts by looking here. Normally, the directory begins on track 18, block 1.

Section 2: BAM

The BAM keeps track of which parts of the disk are used and which parts are available for use by files.

The block availability map takes up the 4th through the 143rd bytes of the BAM block -- a total of 140 bytes.

Each track on the disk is represented by four bytes. ($140/4 = 35!$ Exactly the number of tracks on a disk! What a coincidence!)

Thus, bytes 4 through 7 represent track 1; bytes 8 through 11 represent track 2; and so on up to track 35, which is represented by bytes 140 through 143.

Section 3: Disk name and ID.

Bytes 144 through 161 of the BAM block contain the disk name, filled out with shifted space characters (CHR\$(160)). This is the name you gave your disk when you NEWed it.

Bytes 162 and 163 are the disk ID. The two characters you see after the disk name when you look at a directory are the ID. You assign an ID when you NEW a disk.

Map 2: the BAM: track 18, sector 0

byte

-
- 00 Track of first directory block. Its value is normally eighteen.
 - 01 Sector of first directory block. Its value is normally one.
 - 02 'A'
 - 03 Zero
-

04-143 BAM. Each group of four bytes in this range is used to represent the available space on an entire track. Each 4 bytes is a track bit map. See map 2a.

byte	byte	byte
4=track	1: 8=track	2: 12=track 3
16=track	4: 20=track	5: 24=track 6
28=track	7: 32=track	8: 36=track 9

124=track 31:128=track 32:132=track 33
136=track 34:140=track 35:

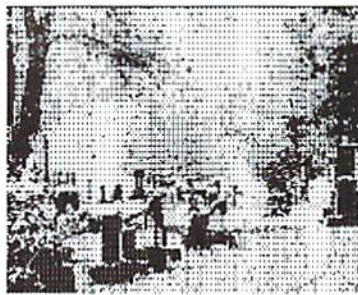
bytes

-
- 144-161 Disk name followed by shifted spaces.
 - 162-164 Disk ID followed by a shifted space
 - 165-166 "2a"
 - 167-170 Shifted spaces
 - 171-255 Unused - all zeros.
-



READY.





Telecommunications: Your Commodore & You

by Mike Eglestone

Let's review a little of last month's column. We talked about the generalities of telecommunications: what a terminal program does, what the "buffer" is and what "upload" and "download" mean during file transfers. Now, we will inspect file transfers in more detail.

When you enter the file transfer area of a bulletin board, you are able to get lists of file names, a file number, and in most cases, a description of what the file is about. Sometimes, file names have little to do with what the program actually accomplishes, so having a description can save both you and the bulletin board a lot of time. A good way to peruse the file lists is to put them into your buffer, save them to disk, and read through them at your leisure; again saving on-line time (and money, if you happen to be calling long distance).

So, now you've found a game file or disk utility you just have to have. Enter the file transfer area of the bulletin board. Tell the board you would like to initiate a "download". You will be asked for a file name and/or number. You may be asked for the transfer protocol. Some bulletin board systems require that you set up the protocol before you actually enter the transfer area. After you enter this data, the BBS will find the file and prepare for transfer.

At this time, your terminal program will require a keypress or two to let it know it will be receiving a file. When you enter this key combination, you will be asked for the filename you wish to save the file under. Most terminals can switch protocols with minimal effort. Now would be a good time to make sure the protocol you selected for the sending system is the same one you have selected for your terminal program. If they don't match, you won't get the file! There will probably be a slight pause and then the transfer should begin.

After each burst/block of data is received, both computers take a look at the information to make sure it's correct. This is called a

checksum procedure. If they detect an error, the same information is sent again. This will continue until both computers are satisfied that the information is error free. Then, and only then, will the data be written to disk and the transfer continues. If excessive errors occur, it would be best to terminate the transfer and find out why. **X-Modem** and **Y-Modem** have a maximum number of allowable errors, and they abort automatically. **Punter** does not have this feature.

I said I might want to get into other areas of interest, such as file compression, program crunching, archives, and the like. It really would be better if you learned that stuff by using it. The programs that do these tasks are normally found in the utilities area of the BBS you call, and the SysOps can and will assist you in learning how they work.

File compression and crunching are methods to reduce the size of the file and shorten transfer time. You can recognize compressed files by the end extension in the file name. The most common are .ARC, .LBR, .LNX, .ARK, and Zip. Each one handles compression and linking a bit differently. The best way to learn to use them is to get your hands dirty and try them out.... Just keep in mind, you can't use a compressed file in its downloaded condition. You have to perform the decompression operation prior to its use.

Well, that's a wrap. I have enjoyed writing this stuff for you, and I may discover that more needs to be said at a later date. If so, "I'll Be Back".

SMS MIKE (SysOp) DiamondBack BBS
(1 (305) 258-5039), Miami, FL.

READY.



Oops!

September 93: The correct Zip Code for Kasara Microsystems is 29926, NOT 19926. The full address is:

Kasara Microsystems
21-G Airport Rd.
Hilton Head Island, SC 29926-3700

More Addresses: The correct street address for PowerDisk is:

PowerDisk
6813 Lotus Way
West Jordan, UT 84084

September 93 (Geez, what's all this stuff from September last year?): Correction for line spacing problems in the MAXI DISK SLEEVE program. Change line 290:

```
290 MI=20:LI=51:PF$=ES+CHR$(LI)
+CHR$(MI):REM---PAPER FEED 20/216
(EPSON FX-800 EMULATION OR 9
PIN PRINTER): FOR EPSON LQ-860
(24) PIN CHANGE -- MI=33:LI=43
```

Add line 295:

```
295 REM---CHECK YOUR PRINTER MANUAL
FOR THE CORRECT CODES FOR THESE
LINE FEEDS. FOR OTHER PRINTERS
YOU MAY NEED TO CHANGE ONE OR
BOTH MI AND LI VALUES.
```

April 94: To clarify things a bit on the subject of ROMs, RAMs and turning off the computer. For those of you new to computing, or those of you who have just had a serious brain cramp, we will reiterate -- Turning off the computer destroys the contents of the RAM (Random Access Memory), which happens to be the area where your programs are stored. The Read Only Memory (ROM) is *not* destroyed! Thus, leaving the computer turned off will not destroy its operating system, which is BASIC.

June 94 Spinner: The SOS program on the disk is in need of a slight alteration (for use on the plus/4 and/or C128 only). Change the part of line 6002 that reads:

```
...:TO"LINEAR Y"
```

to read:

```
...:DLOAD"LINEAR Y"
```

Change the part of line 6020 that reads

```
... ("LINEAR Y"
```

to read:

```
...:DLOAD"LINEAR Y"
```

READY.



R. J. Smulkowski

is

consideration, and OCUg Manor was home BBS for many interesting persons. The message bases there were quite active, and some terribly stimulating debates were participated in by many callers -- and viewed by many more. Quite a few devoted individuals took their turn at running the OCUg Manor BBS, among them Ron Wright, John Bechtel, Guy Girone, Tony Vine, and Trish Hurley. Sysop of OCUg Manor was an elected office of OCUg, and the term of office ran for one year.

This is also, I guess, about the death of a user group. In November of 1993 the remaining members of OCUg voted to disband. OCUg was an officially recognized **commodore** user group and had been active since 1983. Originally chartered as the Olympia VIC Users' Group (OVUG), the group became OCUg in late 1984. A warm and friendly group, OCUg took part in food drives for those less fortunate in our community. In addition to monthly meetings and a BBS, OCUg regularly scheduled Saturday morning breakfast meetings and summer picnics, and was a regular participant in computer fairs held in the open area of a local shopping mall. The 1991 computer fair was quite memorable -- that was the year that the local MS-DOS user group didn't even bother to set up a booth and the **commodore** booth drew and held more public interest than the nearby Amiga display.

Just how does a user group, or a popular BBS for that matter, lose its vitality and fade away? I'm not really sure, but I can tell you that OCUg Manor did not die due to lack of sysop involvement. Trish Hurley is to be commended for her efforts in keeping The Manor afloat for a full half-year after the demise of OCUg -- new software, new screens, new BBS name, the whole nine yards... it still wasn't enough. I wish I had some answers for you, but I don't. I will not hand you any sappy platitudes. What I will do is this: I will tell you that if you are fortunate enough to have a BBS or user group which is of value to you, support it (them) as much as you possibly can. Once they are gone, that's it... finis.

Rest in peace, OCUg and OCUg Manor. You will be remembered well, along with the folks who made you what you were. This column will be well worth the ink if it helps to revitalize just one user group or BBS. For those who were personally involved in OCUg, I think this serves as dignified closure to a decade of service to the world of **commodore** computing.

There is a little empty spot in cyberspace tonight, it is a place where I spent many happy



Requiem for a BBS...

Bulletin boards come, and bulletin boards go... no big deal, right? I mean, it happens every day and life goes on. But I just had to say something about this one anyway...

The OCUg Manor BBS is no longer with us. Operating out of Olympia WA, OCUg Manor was the official bulletin board of the Olympia Commodore Users' Group. Through its distinguished history, OCUg Manor was known in our area as a family-oriented board. Access was not restricted to members of OCUg. Any and all callers received the same

hours. It is a place where I met some good people, a place which many will miss being able to visit. But hey, bulletin boards come, and bulletin boards go. It happens every day, right?

I apologize to you, valued readers, for this column's not being quite in keeping with its usual content. Next time, we'll look into Internet Relay Chat (IRC), private chat rooms, and what goes on in those private rooms. So wind up your computers, folks, this could get pretty heavy!

READY.

Cyberspace

Cowboy



A Case in Point: Exterminating the 1541/71 Relative File Bug

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The relative file bug has been with us for quite awhile now, first hatching in the 1541 and then reproducing and infesting the 1571 drive. It contaminates relative files by feeding on records and eating bits of data. Although entomologists developed a bug spray to ward off the pest, it still continues to byte the unwary. For those of you not familiar with the critter, let's first dissect it, and then we'll offer you the insecticide that will eradicate it once and for all.

Uncovering the Bug.

I'm not sure who first discovered the bug, but Dr. Gerald Neufeld may have been the first to document it in his 1541 User's Guide. Briefly, the bug causes the Position or P command (RECORD# command in BASIC 4.0 and above) to occasionally point to the wrong record. If a record is subsequently written to disk, it gets written to the wrong location, destroying records and corrupting the file. To avoid the bug, Neufeld provided a little insect repellent. He suggested that you point twice and wait a half second before attempting to write a record. This fix became known as "double-pointing" or "double-positioning."

Around about the same time, **commodore** released the 1571 drive. Unfortunately, this drive too had the bug. The user guide recommends you point once before reading or writing a record and once more after (no wait). It's sad **commodore**

acknowledged the bug's existence and even went so far as to describe a work-around, but then decided not to fix it.

In January 1987 and again in May 1988 the *Transactor* published two articles on the subject. The first by David Shilo, titled *Shilo's Raid*, analyzed the bug and defined the criteria under which it would strike. The second, *Olson's Raid*, by Helen Olson refined the Shilo prediction criteria making it more specific. Together, the Shilo-Olson articles used Neufeld's double-point strategy of pointing twice and waiting. More important, they revealed that the bug was triggered only after writing a record that spanned across two adjacent data blocks (i.e., blocks A and B). They went on to show that if after writing a split record, you attempted to write the next record to the data block following B (i.e., block C), the bug would cause the record to be written to block A instead, clobbering one or two records in the process. Knowing this made it possible to reduce the amount of double-pointing needed in a program. Now, you only had to double-point when writing a split record.

In the late 80s when **commodore** developed and released the 1581 drive, they finally decided to eliminate the relative file bug. Creative Micro Designs (CMD) followed suit a little later with the introduction of their new FD and HD drives. Unfortunately, 1541/71 users were forgotten. Neither **commodore** or CMD

(JiffyDOS) offered revised ROMs for the 1541/71 drives that removed the bug.

Today, most programmers using 1541/71 drives are still double-pointing to avoid being bitten, but different methods are being used. Some are pointing twice (and waiting) before writing a record, while others are pointing once before and once more after reading and writing every record. Which method is correct, or does it matter? If you only need to double-point when writing a split record, how do you know when one will occur?

Which Way to Point.

Some months ago while working on a DOS project for the 15x1 series drives, I decided to look for the relative file bug and stamp it out for good. The first step was to write "REL BUG DEMO.BAS," a BASIC program that demonstrates the bug and provides different ways to double-point. (See the program listing at the end of this article.) The program writes split and non-split records to a file, reads them back, and then compares what it wrote to what it read. Nine different ways of pointing are provided. You can choose to double-point before and/or after reading and/or writing a record and can observe the results. Only the last option which points after writing a split record provides the best performance. It only double-points when necessary. Pointing more often doesn't do any harm, but you pay a penalty in performance. Notice, lines

545 - 570 in the BASIC program show how to calculate a split record condition.

In none of the options is a time delay (wait) employed. It's unnecessary. The reason for waiting was based upon a false assumption that DOS could be interrupted to start a new task (command) before finishing the present one. However, this will never happen, since DOS sets an interrupt disable flag with an SEI instruction. If a new task arrives via the serial bus, the interrupt causes only the hardware (not DOS) to respond. The hardware holds the Data line low until DOS finishes what it's doing, thereby putting the computer on hold. The drive is essentially saying, "I'm present, but busy. Hold on, I'll be with you in a moment." When DOS finishes its task, it checks to see if an interrupt occurred, and if so, releases the Data line and reads in the next command over the serial bus.

The "REL BUG DEMO.BAS" program also provided another clue which to my knowledge has not been documented (or perhaps not clearly). I learned the bug can strike without corrupting a file. For example, if you write a split record across two adjacent blocks A and B, and then attempt to read a record in block C, a wrong record is read from block A. Here again, writing the split record does not in itself cause the bug to bite, it just sets up the conditions for it to strike. The bug only bites when you try to read or write a record in the next block.

Hunting Down the Bug in DOS.

Shilo and Olson had presented some important findings that made it possible to narrow the search for the bug to a few routines in DOS responsible for buffer management. One of those, called POSBUF, checks the two internal buffers for the block with the desired record. If the block is not found, then it gets the block from disk. It looked like something had to be wrong here, since DOS was writing a record to a block it thought was in the buffer when in fact it wasn't.

```
*      =  $E29C      ;STARTING ADDRESS OF POSBUF IN 1541/71
;
POSBUF  LDA DIRBUF    ;GET LO BYTE SS POINTER TO DESIRED TRACK/SECTOR
        STA R3        ;COPY IT
        LDA DIRBUF+1  ;GET HI BYTE SS POINTER TO DESIRED TRACK/SECTOR
        STA R4        ;COPY IT
        JSR BHERE     ;CHECK IF DESIRED BLOCK IS IN 1ST BUFFER
        BNE P10       ;IS DESIRED BLOCK IN 1ST BUFFER? NO
        RTS

P10     JSR SCRUB     ;IF NECESSARY, WRITE OUT BLOCK IN 1ST BUFFER TO DISK
        JSR GETLNK   ;GET TRACK/SECTOR LINK OF BLOCK IN 1ST BUFFER
        LDA TRACK
        BEQ P80      ;IS BLOCK IN 1ST BUFFER THE LAST BLOCK? YES
        JSR BHERE2   ;CHECK IF NEXT BLOCK IS DESIRED BLOCK
        BNE P75      ;IS NEXT BLOCK THE DESIRED BLOCK? NO
        JSR DBLBUF   ;SWITCH TO 2ND BUFFER AND IF NECESSARY RESTORE BLOCK
        JMP FREIAC   ;FREE INACTIVE 1ST BUFFER

P75     JSR FREIAC   ;FREE INACTIVE 2ND BUFFER P80
        LDY #$00
        LDA (R3),Y   ;READ THE DESIRED TRACK NO. FROM THE SIDE SECTOR (SS)
        STA TRACK    ;SAVE IT AS THE CURRENT TRACK NO.
        INY
        LDA (R3),Y   ;READ THE DESIRED SECTOR NO. FROM THE SIDE SECTOR (SS)
        STA SECTOR   ;SAVE IT AS THE CURRENT SECTOR NO.
        JMP STRDBL   ;READ THE DESIRED BLOCK INTO 1ST BUFFER,
                    ;CHANGE TO 2ND BUFFER & RESTORE BLOCK,
                    ;READ THE NEXT BLOCK INTO 2ND BUFFER,
                    ;CHANGE BACK TO 1ST BUFFER
```



When DOS opens a relative file it creates two 256-byte working buffers to hold the data. The first buffer is made active, and the second is inactive. (Actually, a third buffer is used for the side sector but we'll ignore that one for now.) As shown above, POSBUF calls the BHERE routine to check if the desired block is in one of the two buffers.

```
*      =  $E2D0      ;STARTING ADDRESS OF BHERE IN 1541/71
;
BHERE   JSR GETHDR   ;READ THE TRACK & SECTOR OF THE BLOCK IN THE BUFFER
BHERE2  LDY #$00
        LDA (R3),Y   ;READ THE DESIRED TRACK FROM THE SIDE SECTOR TABLE
        CMP TRACK    ;DO THEY MATCH?
        BEQ BH10     ;YES
        RTS

BH10    INY
        LDA (R3),Y   ;READ THE DESIRED SECTOR FROM THE SIDE SECTOR TABLE
        CMP SECTOR   ;DO THEY MATCH?
        RTS
```



Notice though, that POSBUF is not calling the BHERE routine the same way twice. The first buffer is checked using BHERE, but the second is checked using BHERE2. POSBUF uses BHERE2 because it assumes the block in the 2nd buffer always follows the one in the 1st. But wait a minute... is this always true? If it wasn't, it would certainly explain why DOS was occasionally writing a record to the wrong block. Before answering, let's first examine how the buffers are used when reading or writing blocks.

Double Buffers.

The concept of using two data buffers for a file goes back to when **commodore** originally developed the DOS for its IEEE dual drives. (The DOS used in all other subsequent **commodore** drives, including the 15x1 series, are a derivative of this earlier DOS.) The IEEE dual drives were designed with two on-board processors. One CPU handled communications with the computer and used the active buffer, and the other CPU, responsible for managing the disk drive controller, used the inactive one. Each CPU had access to only one buffer at a time. When both CPUs were done with their respective buffers, DOS would swap the active and inactive buffers allowing each CPU access to the other's data. Using two buffers allowed the CPUs to operate concurrently for better performance and speed. One CPU could be sending data to the computer while the other was reading the next block of data from disk. Little time was wasted competing for the same buffer.

When the 1541 drive was developed, **commodore** made a number of changes to cut costs. For example, the IEEE parallel interface was changed to a serial cable, the amount of RAM reduced, and one CPU was eliminated. Although a single buffer could have done the job, the two-buffer concept was continued. The single CPU now had to divide its time between both buffers. It used the inactive buffer to transfer data to/from the disk media and used the active buffer for most all other operations.

More Evidence.

Since the 1581 drive and 8250 IEEE dual drive didn't have the bug, I decided to compare the POSBUF routine in them to the one in the 1541/71. I found that both the 1581 and 8250 routines were calling BHERE twice -- once for each buffer. They weren't assuming the block in the inactive buffer followed the one in the active buffer, and they weren't making any calls to BHERE2.

It was now beginning to look as if the relative file bug was created and had followed the same migration path into the 1541 as the renowned @save/replace bug. Remember that one? How could we forget! It was probably the one bug that had more publicity, caused more heartache, and destroyed more files than any other. Today some users still shy away from using the @save/replace command even though **commodore** corrected the problem in the later 15x1 drives. It was discovered that the bug was inadvertently introduced in some of the earlier 1541 drives when **commodore** converted the IEEE DOS.

At this point I was pretty sure that POSBUF was making an incorrect assumption, but why was a split record triggering the bug? The reason resided with the NRBUF routine. DOS was calling it whenever it was reading or writing a record that spanned two adjacent blocks. (It's not used by POSBUF.) Here's how the routine appears:

```
*      =  $E03C      ;STARTING ADDRESS OF NRBUF IN 1541/71
;
NRBUF  JSR SETDRN    ;SETUP DRIVE NO.
      JSR RDLINK    ;READ TRACK/SECTOR LINK OF NEXT BLOCK
      JSR GAFLGS    ;WAS CONTENTS OF 1ST BUFFER ALTERED?
      EVC NRBU50    ;NO, THEN MUST BE READING RECORDS
;
; WRITING RECORDS
;
      JSR WRTOUT    ;WRITE BLOCK IN 1ST BUFFER OUT TO DISK
      JSR DBLBUF    ;SWITCH TO 2ND BUFFER AND IF NECESSARY RESTORE BLOCK
      LDA #$02
      JSR SETPNT    ;SET POINTER TO START OF DATA IN 2ND BUFFER
      JSR TSTWRT    ;WAS BLOCK IN 2ND BUFFER WRITTEN TO DISK?
      BNE NRBU20    ;NO, THEN NEXT BLOCK ALREADY IN 2ND BUFFER
      JSR RDAB      ;READ NEXT BLOCK INTO 2ND BUFFER (NOW ACTIVE)
      JMP WATJOB    ;WAIT UNTIL READ JOB IS DONE
;
; READING RECORDS
;
NRBU50 JSR DBLBUF    ;SWITCH TO 2ND BUFFER AND IF NECESSARY RESTORE BLOCK
      JSR TSTWRT    ;WAS BLOCK IN 2ND BUFFER WRITTEN OUT TO DISK?
      BNE NRBU70    ;NO, THEN NEXT BLOCK ALREADY IN 2ND BUFFER
      JSR RDAB      ;READ NEXT BLOCK INTO 2ND BUFFER
      JSR WATJOB    ;WAIT UNTIL READ JOB IS DONE
NRBU70 JSR RDLNK    ;READ TRACK/SECTOR LINK OF BLOCK IN 2ND BUFFER
NRBU80 LDA TRACK    ;IS BLOCK IN 2ND BUFFER THE LAST BLOCK IN FILE?
      BEQ NRBU20    ;YES
      JSR DBLBUF    ;SWITCH BACK TO 1ST BUFFER
      JSR RDAB      ;READ ANOTHER BLOCK INTO 1ST BUFFER (READ AHEAD)
      JSR DBLBUF    ;SWITCH BACK TO 2ND BUFFER (NOW ACTIVE)
NRBU20 RTS
```



DOS calls on NRBUF when it needs another block to finish reading or writing a record. It's called just before the record is about to cross the buffer boundary into the second block. Unlike POSBUF, NRBUF doesn't use BHERE or BHERE2 to check blocks. Instead, it relies on GAFLGS

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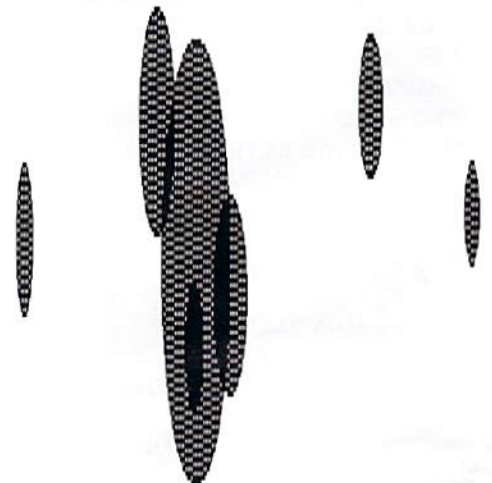
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and TSTWRT to tell it whether DOS recently read or wrote a block to disk, and what order the blocks are in.

If DOS was reading records, then NRBUF reads the next block into the active buffer, and gets the block that immediately follows and stores it in the inactive buffer. The process of reading an extra block is called "reading ahead." However, if DOS was writing records, then NRBUF reads only the next block into the active buffer. It doesn't read ahead an extra block because that block may not yet exist (such as when a file is being created). As a result the inactive buffer continues to hold the PREVIOUS data block! Now we know the answer to our earlier question. The block in the inactive buffer does NOT always follow the one in the active buffer. The assumption POSBUF was making was wrong.

To illustrate, assume a file has three consecutive blocks A, B, and C; and suppose DOS begins reading or writing a record that starts in block A.

BEFORE READING/WRITING RECORD
 A B
 ACTIVE INACTIVE

If DOS finishes the record without crossing into block B, then NRBUF is not called, and the buffer arrangement remains unchanged:

AFTER READING/WRITING NON-SPLIT RECORD
 A B
 ACTIVE INACTIVE

If, however, the record is split (part in A and part in B), then when DOS reaches the buffer boundary, it calls on NRBUF to setup block B. After DOS has completed the split record, the buffers end up looking like this:

AFTER WRITING SPLIT RECORD AFTER READING SPLIT RECORD
 A B C B
 INACTIVE ACTIVE INACTIVE ACTIVE

Notice the active block is now B, and the inactive buffer holds either the next block (C) or the previous block (A) depending upon whether DOS was reading or writing. More important, observe that in all three cases after DOS has finished a record, the block in the inactive buffer follows the block in the active buffer EXCEPT when DOS has written a split record.

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Now, it's clear why writing a split record was triggering the bug. When DOS finished writing a split record, it left the previous block in the inactive buffer. Then when a POSITION or RECORD# command was sent to the drive, POSBUF wrongly assumed the inactive buffer had the next block and pointed to where it believed the record to be. Subsequently, either the wrong record would be read or a record would be written to the wrong location in the file.

The Insecticide.

Now that we've located the relative file bug, and know why a split record set up the conditions for it to strike, the fix is pretty straightforward. We just have to ensure POSBUF calls BHERE twice the same way. It can't make any assumptions about what blocks are in the buffers. POSBUF has to actually read the track/sector header for the block in the 2nd buffer with GETHDR just like it did for the 1st.

The patch below eliminates the relative file bug, and is similar to the POSBUF routine in the 1581. Notice though, the two FREIAC calls are gone. They were found to be inappropriate and unnecessary (commodore eliminated them in the 1581 drive.).

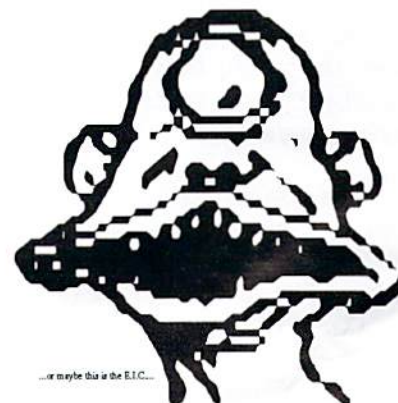
```

; *** POSBUF PATCH TO ELIMINATE THE RELATIVE FILE BUG AND FREIACs ***
;
; SAME SIZE AS ORIGINAL POSBUF (52 BYTES)
; INTENDED FOR THE 1541 AND 1571 DRIVES
;
DIRBUF = $94
R3     = $89
R4     = $8A
TRACK  = $80
SECTOR = $81
;
BHERE  = $E2D0
SCRUB  = $DDF1
DBLBUF = $CF1E
GETLNK = $DE0C
NRBU80 = $E06E
STRDEL = $D0AF
;
*      = $E29C ;STARTING ADDRESS OF POSBUF IN 1541/71
;
POSBUF LDA DIRBUF ;GET LO BYTE SS POINTER TO DESIRED TRACK/SECTOR
        STA R3    ;COPY IT
        LDA DIRBUF+1 ;GET HI BYTE SS POINTER TO DESIRED TRACK/SECTOR
        STA R4    ;COPY IT
        JSR BHERE  ;CHECK IF DESIRED BLOCK IS IN 1ST BUFFER
        BNE P10   ;IS DESIRED BLOCK IN 1ST BUFFER? NO
        RTS

P10    JSR SCRUB  ;IF NECESSARY, WRITE OUT BLOCK IN 1ST BUFFER TO DISK
        JSR GETLNK ;GET TRACK/SECTOR LINK OF BLOCK IN 1ST BUFFER
        LDA TRACK
        BEQ P80   ;IS BLOCK IN 1ST BUFFER THE LAST BLOCK? YES
        JSR DBLBUF ;SWITCH TO 2ND BUFFER
        JSR BHERE  ;CHECK IF DESIRED BLOCK IS IN 2ND BUFFER
        BNE P80   ;IS DESIRED BLOCK IN 2ND BUFFER? NO
        JSR GETLNK ;GET TRACK/SECTOR LINK OF BLOCK IN 2ND BUFFER
        JMP NRBU80 ;READ NEXT BLOCK INTO 1ST BUFFER & RETURN TO 2ND

P80    LDY #$00
        LDA (R3),Y ;READ THE DESIRED TRACK NO. FROM THE SIDE SECTOR (SS)
        STA TRACK  ;SAVE IT AS THE CURRENT TRACK NO.
        INY
        LDA (R3),Y ;READ THE DESIRED SECTOR NO. FROM THE SIDE SECTOR (SS)
        STA SECTOR ;SAVE IT AS THE CURRENT SECTOR NO.
        JMP STRDEL ;READ THE DESIRED BLOCK INTO ONE BUFFER
                  ;SWITCH & READ THE NEXT BLOCK INTO OTHER BUFFER
                  ;RETURN TO THE PREVIOUS BUFFER

```



Some Final Points.

Why wasn't the bug found earlier? Part of the reason may be due to a number of errors in Neufeld's

...or maybe this is the E.T.C.

1541 book Inside Commodore DOS. One of those, as luck would have it, shows POSBUF calling BHERE twice -- not BHERE and then BHERE2. While we're on the subject of relative file bugs, let's clear up some misconceptions and mistakes in some books.

1. It's widely believed that relative files with record lengths of 42, 58, or 63 can't be created. These lengths, however, are perfectly legal provided the drive number precedes the file name.

```
OPEN 2,8,2,"0:RELFILENAME,L,"
+CHR$(length)
```

2. Some disk drive manuals fail to show the offset byte in the Position (P) command as optional. Those that do, forget to include the trailing semicolon. When the offset is left off, DOS will use a default value of 1. However, if both the offset and semicolon are omitted, DOS interprets the implied carriage return as an offset of 13. As such, the record is read or written beginning with the 13th character. The correct syntax when omitting the offset should be:

```
PRINT# 15,"P"+CHR$(channel#+96)
+CHR$(rec#lo)+CHR$(rec#hi);
```

3. Most texts on relative files maintain that if you intend to use INPUT# to read records, then you must count a carriage return (CR) as part of the record length and send it with each record. However, in most cases you don't need to worry about the CR at all. DOS will provide it automatically at the end of each record. This lets you squeeze an extra character into every record. (The "REL BUG DEMO.BAS" program uses this technique.)

4. Some books state that files with record lengths of only 2 through 254 can be created, but a record length of 1 is also acceptable. If you create such a file, each character is one record and can be retrieved with GET# just like a SEQ file. Now, however, you don't have to read most or all the file to access text in the middle or end of the file. Instead, just point to the character position and begin reading/writing.

Are there any other bugs hiding in DOS? Well, surprisingly yes. Most are harmless (see *dieHard* issue #22). In a future article we'll look at a few bugs and a little known feature in the COPY (C) command. Questions or

comments? You can reach me on QLink (MIKE ALL) or on GENie (MGILSDORF1) Until then... Easy DOS it.

Epilog.

After writing this article I learned from Randy Winchester (creator of KeyDOS for the C128) that George Hugg may have written a text file on this same subject and uploaded it onto the Internet. Unfortunately, I wasn't able to obtain a copy of the file and include his findings in time for this write-up.

Notice: In order to patch POSBUF, you'll need access to (or know someone who has) an EPROM programmer. (I recommend the Promenade C1 EPROM Programmer for the **commodore 64** and **128**, with PROMOS 2.0 OS, manufactured by Jason-Ranheim Co.). Removing your ROM/EPROM chip and modifying the DOS will void any warranty you might have. If you never programmed an EPROM chip before, find someone who has and ask them to do the modification for you. A mistake could damage your drive. The 1571s and some of the newer 1541s already have EPROMs in them so you could erase and reprogram the original chip. However, I recommend you store the original chip away for safe-keeping and obtain another one to patch.

Providing a detailed step-by-step list of instructions in how to program an EPROM chip is beyond the scope of this article. Recommend reading the EPROM Programmers Handbook for the C64 and C128 by CSM Software, written by Bill Melon. It contains valuable information about

programming EPROMs for the C128/64 and discusses how to calculate the checksum bytes which DOS uses to check itself. Some other references you may find useful are:

The Anatomy of the 1541, by Abacus Software, written by Lothar Englisch & Norbert Szczepanowski, ISBN 0-916439-01-1.

1571 Internals, by Abacus Software, written by Rainer Ellinger, ISBN 0-916439-44-5.

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Trader's Corner

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Wanted: 1541/71 Physical Exam calibration disk (Cardinal Software). #C001134, Richard L. Temple, 1837 W. 8th St., Davenport, IA, 52802.

Wanted: Information on the following programs: Budget, Budget Report, Budget-Master, Budgeter, Checkbook Balance, Expenditure Mate, Future Finances, Pay Check, Personal Finances, Power Budget Issue, Tax Records, Weekly Budget, Budget Tracker, Budgetmeister, Fund Analyzer and Home Budget for Current Year. #C006933, Donald J. Bucholtz, 3416 Melwood Av., Pittsburgh, PA, 15219-3758

To Trade: commodore 128 Programmer's Reference Guide (new), Datasette-153 (unused), Fun Graphics Machine, Quikpro+ II, Time Traveler, Computer Diagnostics. Am interested in NX-1000C printer and 1541-C disk drive. Also have lots of books. Write for list. #C009789, Sal-Otto, PO Box 3, Henderson, NC, 27536.

Wanted: Information on a program that will allow PaperClip or Word Pro, or any ASCII-based commodore word processor, to produce SmartQuotes (true quotation marks). #C011562, Jack Schroder, 13555 Skyline Blvd., Oakland, CA, 94619.

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To Trade: I have several game programs to trade for hardware or 128 software. I also have 2 word processors and a Super Snapshot. They are all C64. Too many to list. #C009629, Bob Young, 355 Maria Av., #17, St. Paul, MN, 55106

Wanted: Manuals and programs for the Commander 264. Also looking to exchange programs for the VIC-20. #C008270, Joseph Pesklo, 3844 Oakhills Dr., Bloomfield Hills, MI, 48301.

Wanted: Arotek's Universal RS-232 Interface that can be used with a serial printer. Word Writer 128 (Timeworks), Basic 8 and the Basic 8 Toolkit (Free Spirit). #C005883, George Fraaney, Box 64, Foresthill, CA, 95631-0064.

Wanted: Manual for a C128D. Would be willing to pay for one. #C006260, Paul M. Kleindl, 109 Park Av. S., PO Box 456, Vernon Center, MN, 56090-0456.

Wanted: One or two fully functional Cardco "Write Now!" word processing cartridge(s); will pay king's ransom: \$125.00 each! Not enough? Name your price! #C005172, Dennis Olivares, 1900 Eads St., #734, Arlington, VA, 22202.

Wanted: Front half to a 1702 monitor, complete with door and commodore logo, must be in good condition. #C001785, Allan Casebolt, 7553 Able St. N.E., Fridley, MN, 55432.

Wanted: VIC-1011A RS-232C Terminal Type interface documentation, HES Writer cartridge docs, VIC-1213 Machine Language Monitor docs, VIC-1211A commodore Super Expander w/3K RAM cartridge docs, VIC-1212 commodore Programmer's Aid cartridge docs, VIC-1111 commodore 16K RAM cartridge docs, VIC pn 902502-02 power supply for VIC-20, VIC-20 & C64 programs on cassette, Speedterm 64 (Abacus), and the following books: The Anatomy of the C-64 (Abacus), The Anatomy of the 1541 (Abacus), Machine Language for the C-64 (Abacus), Advanced Machine Language for the C-64 (Abacus), Machine Language Routines for the Commodore 64 and 128 (Compute!), Mapping the Commodore 64 and 64C (Compute!), The Microcomputer in the Laboratory (Sigma), Easy Interfacing Projects for the VIC-20 (Prentice Hall), Electronic Projects for your Commodore 64 and 128 (TAB), and Serious Programming for the Commodore 64 (TAB). #C008954, Alvin P. Schmitt, 312 Woodbine Dr., Blacksburg, VA, 24060-1442.

Wanted: Information on Genealogy programs. #Cxxxxxx, L. Estelle Heron, 751 Connie Dr., Lake, MI, 48632.

To Trade: c64 commercial programs, most have original boxes. Send list. #Cxxxxxx, Randy Jenkins, 6224 Lafayette Rd., Medina, OH, 44256.

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Welcome to PRG. PRG is the type-in program section of dieHard. It get's it's name from the commodore directory listing. Programs that you can RUN from BASIC appear in a directory listing as PRG. When you type in a program there are some things you will need to watch for.

When you see something in brackets [] do *not* enter the brackets. This represents a set of keystrokes. [shift A] means to hold down the <SHIFT> key, then press <A>. [CLR] means to press <CLR> which is actually the shifted <HOME> key.

When entering a PRG for the C64, use the dH Checksum program to be sure your typing is accurate.

Be sure to save your program frequently. That way if the power goes out, you only loose a little of your work rather than all. Enjoy!!!



Popcorn (C64)

by Rick Hedrick

Another of Rick Hedrick's math intensive HIRES graphics plots. As with his other programs, re-run the program after it draws the picture and save as a PS panel or snapshot it with your favorite utility.

Popcorn C64

```
10 REM COPYRIGHT 1994 LYNNCARTHY
  INDUSTRIES, INC. ALL RIGHTS
  RESERVED. :REM 16
20 PRINTCHR$(147):POKE53280,14
  :POKE53281,0:REM 75
30 PRINT"* C.A.PICKOVER'S
  'POPCORN':PRINT'MAGNIFICATION
  FORM':REM 69
40 AZ$="":PRINT"[C= 6]? SAVE PRIOR
  SCREEN IN 8192 AREA
  Y/N=[C= 7]":REM 87
50 GETAZ$:IFAZ$=""THEN50:REM 173
60 IFAZ$="Y"THEN570:REM 9
70 PRINT"---":PRINT"[C= 8]ON A GRAPH
  OF 1-50 X 1-50...":REM 0
80 PRINT"CHOOSE AN AREA TO MAGNIFY AS
  LOWER":PRINT"LEFT, UPPER RIGHT
  POINTS":REM 195
90 PRINT"---":PRINT"YOU MAY START
  WITH THE PROMPTS":PRINT"IN
  (PARENS)...[C= 7]":REM 155
100 PRINT"---":INPUT"X1(10)=";C1
  :INPUT"Y1(10)=";C2:REM 200
110 PRINT:INPUT"
  X2(20)=";C3:INPUT"Y2
  (20)=";C4:C5=ABS(C1-C3)
  :C6=ABS(C2-C4):REM 119
120 IF(C1>50)OR(C2>50)OR(C3>50)
  OR(C4>50)THENPRINT"[C= 3]A SCALE
  IS >50[C= 7]":GOTO100:REM 72
130 IF(C3<C1)OR(C4<C2)
  THENPRINT"[C= 3]A 2-ND SCALE
  SMALLER THAN 1-ST
```

```
SCALE[C= 7]":GOTO100:REM 46
140 C5=INT(C5/2):C6=INT(C6/2):REM 75
150 PRINT"[C= 3]* PRESS RETURN TO
  START WRITE *":REM 255
160 PRINT:PRINT"(BORDER
  REDDENS & WAITS WHEN
  DONE)[C= 7]":AZ$=""
  :INPUTAZ$:REM 197
170 TT=0:REM 222
180 REM OPEN BIT MAP AT
  8192:REM 112
190 BA=2*4096
  :POKE53272,PEEK(53272)OR8:REM 1
200 POKE53265,PEEK(53265)OR32:REM 156
210 FORI=BATO(BA+7999):POKEI,0
  :NEXT I:REM 115
220 FORI=1024TO2023:POKEI,15
  :NEXTI:REM 215
230 REM:REM 86
240 FORJ=C1TOC3:REM 103
250 FORK=C2TOC4:REM 98
260 XO=-+.24*J:YO=-+.24*K:REM 206
270 XA=XO:YA=YO:REM 21
280 FORNN=1TO50:REM 145
290 XX=XA-.05*SIN(YA+
  TAN(3*YA)):REM 217
300 YY=YA-.05*SIN(XA+TAN(3*XA)):REM 61
310 REM *** .05 IS 'H' MAY BE
  CHANGED:REM 169
320 XA=XX:YA=YY:REM 255
330 JP=160*XX/C5+160
  :KP=100*YY/C6+100:REM 92
340 X=JP:Y=KP:GOSUB440:REM 124
350 NEXTNN:REM 83
360 NEXTK:REM 83
370 NEXTJ:REM 95
380 POKE 53280,2:REM 0
390 GOTO 390:REM 37
400 END:REM 18
410 POKE53280,2:REM 34
420 GOTO 420:REM 84
430 END:REM 44
440 REM SET A POINT:REM 239
```

```
450 Y=200-Y:REM 93
460 IFX<=0THENRETURN:REM 250
470 IFX>319THENRETURN:REM 102
480 IFY<=0THENRETURN:REM 9
490 IFY>199THENRETURN:REM 116
500 REM:REM 103
510 CH=INT(X/8):RO=INT(Y/8)
  :LN=YAND7:REM 237
520 BY=8192+RO*320+8*CH+LN:REM 179
530 BI=7-(XAND7):REM 185
540 POKEBY,PEEK(BY)OR(2^BI):REM 18
550 RETURN:REM 154
560 END:REM 178
570 PRINT"SAVE MEMORY 8192-16192"
  :PRINT:REM 32
580 A=8192
  :REM STARTING ADDRESS:REM 54
590 B=16192
  :REM ENDING ADDRESS:REM 45
600 A1=INT(A/256):A2=A-256*A1:REM 164
610 PRINT"LESS THAN 16 CHARACTER
  FILENAME:":E$="":INPUT E$:REM 102
620 PRINT"(SAVES WITH REPLACE OF
  ORIGINAL NAME)":REM 2
630 OPEN15,8,15,"S0:"+E$:REM 171
640 OPEN1,8,1,"0:"+E$+"",P,W":REM 208
650 PRINT#1,CHR$(A2)CHR$(A1):REM 72
660 FORJ=ATOB:PRINT#1,CHR$(
  PEEK(J)):REM 212
670 NEXT:REM 31
680 CLOSE1:VERIFYE$,8,1:REM 36
690 INPUT#15,A$,B$:PRINTA$,B$
  :CLOSE15:REM 36
700 END:REM 63
```

.....end of line.

Popcorn plus/4 & C16

```
20 PRINTCHR$(147):COLOR4,15:COLOR0,1
190 BA=2*4096:GRAPHIC1,1
  Remove lines 210 & 220
380 COLOR 4,3
410 COLOR 4,3
```

.....end of line.



Base Convert (C64 & plus/4 & C16)

by Paul Highland

This little ditty will convert numbers to and from any base between base 2 and base 36. Handy for programmers, students and the curious. For the plus/4 & C16 leave out the two POKEs in line 40.

Base Convert.64

```
10 REM COPYRIGHT 1994,
LYNNCARTHY INDUSTRIES, INC.
ALL RIGHTS RESERVED.:REM179
20 O=36:Z=1E9-1
:DIMN$(O)
:C$="0123456789ABCD
EFGHIJKLMNOPQRSTUVWXYZ":REM 157
30 FORI=0TOO-1:N$(I)=MID$(
C$,I+1,1):NEXT:REM 149
40 POKE53281,6:POKE53281,0:PRINT"[CLR]
[ctrl N][ctrl 9][shift C]-64
[shift B]ASE [shift C]ONVERSIONS
[ctrl down]":REM 178
50 PRINT"[C= 3][shift N]UMBERS WITH
VALUES GREATER THAN":PRINT"
[ctrl left]"Z"BASE 10 WILL NOT
WORK.":REM 94
60 PRINT"[C= 6][shift E]NTER ANY
OUT-OF-BOUNDS VALUE TO
EXIT.":REM 102
70 PRINT"[ctrl 4][ctrl down]
[shift F]ROM WHAT BASE
[2"STR$( -O) "]::INPUTB1%
:ON-(B1%<2ORB1%>O)GOTO310:REM 103
80 PRINT"[shift T]O WHAT BASE
[2"STR$( -O) "]::REM 218
90 INPUTB2%:ON-(B2%<2ORB2%>OORB2%=B1%)
GOTO40:REM 130
100 N1$="":INPUT"[ctrl 4]
[shift N]UMBER TO
CONVERT":N1$:REM 201
110 NO$=N1$:N2$=""
:ON-(N1$="OR"OR"0")GOTO70:REM 41
120 L=LEN(N1$):K=0:J=B1%-1
:FORI=1TOL:REM 104
130 IFMID$(N1$,I,1)>N$(J)
THENK=L:REM 72
140 NEXT:REM 11
150 IFK=LTHEN PRINT"[C= 3][shift B]
AD INPUT, PLEASE TRY AGAIN...
[ctrl 4]":GOTO100:REM 120
160 ON-(B1%<>10)GOTO180:N=VAL(N1$)
:IFN>Z THENGOSUB290:GOTO100:REM 35
170 NO$=N1$:D=N:GOTO250:REM 122
180 :REM 123
190 D=0:K=B1%-1:FORI=1TOL
:FORJ=0TOK:REM10
200 IFMID$(N1$,I,1)=N$(J)THENN=J
:J=K:REM 143
210 NEXT:D=D+N*INT(B1^(L-I)):NEXT
:N2$=STR$(D):REM 201
220 IFD>ZTHENGOSUB290:GOTO100:REM 46
230 ON-(B2%<10)GOTO280:REM 9
240 NO$=N1$:N1$=N2$:N2$="" :REM 26
250 :REM 193
260 Q=INT(D/B2%):R=D-Q*B2%
```

```
:N2$=N$(R)+N2$:IFQ=>B2%THEND=Q
:GOTO260:REM 96
270 N2$=N$(Q)+N2$:REM 205
280 N1$=NO$:GOSUB300:GOTO100:REM 114
290 PRINT"[C=3][shift N]UMBER IS TOO
LARGE; TRY AGAIN...[ctrl down]
:RETURN:REM 251
300 PRINT"[C=6]"N1$"[ctrl 4]
BASE[C=8]"B1%"[ctrl 4]=[ctrl 8]
"N2$"[ctrl 4]BASE[C=8]"B2%
:RETURN:REM 201
310 PRINT"[CLR][ctrl 8]";:END:REM 158
.....end of line
```

Base Convert 128 (C128)

by Paul Highland

This one works just like the 64 version, but takes advantage of the extended commands of the 128 as well as utilizing the 80 column screen.

Base Convert.128

```
10 REM COPYRIGHT 1994, LYNNCARTHY
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20 TRAP270:COLOR4,6:COLOR0,1
:POKE1023,RCLR(5):SYS30660+
17*(RWINDOW(2)=80)
30 O=35:Z=1E9-1:DIM N$(O)
:E$=CHR$(27):C$="012345678
9ABCDEFHIJKLMNOPQRSTUVWXYZ"
:FORI=0TOO:N$(I)=MID$(C$,I+1,1)
:NEXT
40 PRINT"[CLR][ctrl N][rvs on]
[shift C]-128
[shift B]ASE
[shift C]
ONVERSIONS
[ctrl down]"
50 PRINT"[C= 3]
[shift N]UMBERS
GREATER THAN
"Z"BASE 10 WILL NOT
WORK."
60 PRINT"[ctrl 4]
[ctrl down]
[shift F]ROM WHAT
BASE [2-"MID$(
STR$(O+1),2) "]::
INPUTB1%:ON-(
B1%<2ORB1%>O+1)
GOTO270
:IFRWINDOW(2)=80
THENPRINT"
[ctrl up]"E$"K";
70 PRINT"[shift T]O
WHAT BASE
[2-"MID$(
STR$(O+1),2) "]::
INPUT B2%:ON-(
B2%<2ORB2%>O+1OR
B2%=B1%)GOTO270
80 PRINT"[ctrl 4]
[shift N]UMBER TO
```

```
CONVERT"::POKE842,153:POKE208,1
:INPUTN1$:NO$=N1$:N2$=""
:ON-(N1$="0")GOTO60
90 L=LEN(N1$):FORI=1TOL
:J=INSTR(C$,MID$(
N1$,I,1)):IFJ>B1%THENI=L
100 NEXT:IFJ<1ORJ>B1%THENPRINT"[C=3]
[shift B]AD INPUT, PLEASE TRY
AGAIN...[ctrl 4]":GOTO80
110 ON-(B1%<>10)GOTO130:D=VAL(N1$)
:IFD>ZTHENPRINT"[C= 3]
[shift N]UMBER IS
TOO LARGE; TRY AGAIN...
[ctrl 4][ctrl down]":GOTO80
120 NO$=N1$:GOTO190
130 REM"[shft/return][ctrl up]
[3 ctrl right][ctrl 2][shift B]ASE
N TO DECIMAL[ctrl 4]
140 IFB1%=16ANDL<5THENN2$=STR$(
DEC(N1$)):D=VAL(N2$):GOTO170
150 D=0:FORI=1TOL
160 R$=MID$(N1$,I,1)
:D=D+INT((INSTR(C$,R$)-1)
*B1^(L-I)):NEXT:N2$=STR$(D)
170 IFD>ZTHENPRINT"[C= 3]
[shift N]UMBER
IS TOO LARGE; TRY
AGAIN...[ctrl down]":GOTO80
180 ON-(B2%=10)GOTO230:NO$=N1$:N1$=N2$
:N2$=""
190 REM"[shft/return][ctrl up]
[ctrl right][ctrl right]
[ctrl right][ctrl 2]
[shift D]ECIMAL TO BASE N[ctrl 4]
200 N=VAL(N1$):IFB2%=16ANDN<65536
```



```

THENN2$=HEX$(N):GOTO230
210 D=N:DO:Q=INT(D/B2%):R=D-Q*B2%
:N2$=N$(R)+N2$
220 D=Q:LOOPUNTILQ<B2%:N2$=N$(D)+N2$
230 N1$=N0$:GOSUB240:GOTO80
240 IFRWINDOW(2)=80THENPRINT"[crsr up]
"E$K";:ELSEPRINTN1$;
250 PRINT"[ctrl 4] BASE[C= 8]"B1%"
[ctrl 4]=[ctrl 8]"N2$"[ctrl 4]
BASE[C= 8][ctrl g]"B2%:RETURN
260 PRINT"[HOME][HOME][CLR][C= 3]
[shift E]RROR#"ER;ERR$(ER)" AT
LINE"EL"[ctrl 8]";:HELP:RETURN
270 ON-(ER>0)GOSUB260:COLOR5
,PEEK(1023):END

```

.....end of line.

Random Music (VIC 20)

by Ernie Barkman

Ernie has done other programs for us, but this is a new twist. He just got a VIC 20 and decided poor little VIC needed some programs, too. Here is his first effort, direct to you! When running the program, 1 is the slowest tempo, 9 the fastest. Tempo can also be controlled with the + and - keys when notes are playing. Tapping 1, 2 or 3 during your concert will toggle that particular voice on or off. If you create something a little too alien for your ears, the Q key will exit the program. Enjoy!

Random Music.VIC

```

10 REM FOR TRISTA AGE
5. 5/23/1994
BY ERNIE BARKMAN
HER PAW-PAW.
20 REM COPYRIGHT 1994
30 REM LYNNCARTHY
40 REM IND. INC.
ALL RIGHTS RESERVED
50 POKE36879,27
60 PRINT"[ctrl 7]
[CLR][6 space]
[3 C= I][ctrl 9]
[space]VIC[3 space][ctrl 0]
[4 C= I]"
70 PRINT"[C= @][C= P][C= O][C= I]
[ctrl 9][C= T]RANDOM MUSIC[C= T]
[ctrl 0][C= I][C= O][C= P][C= @]"
:PRINT"[3 space]TEMPO 1-9[3 space]
1=FASTEST";
80 PRINT"[13 space]9=SLOWEST"
90 GETQ$:IFQ$=""THEN90
100 EB=VAL(Q$)*90
110 IFQ$<"1"ORQ$>"9"THEN90
120 Q$=""
130 POKE36878,INT(RND(1)*7)+3
:PRINT"[HOME][crsr down]
[3 crsr down][space]
TEMPO"EB/90"[C= 6][2 space]"
140 IFF1THENPOKE36874,0:GOTO170
150 POKE36874,RND(1)*121+135

```

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```

160 FORB=1TOEB:NEXT
170 IFF2THENPOKE36875,0:GOTO200
180 POKE36875,RND(1)*121+135
190 FORB=1TOEB:NEXT
200 IFF3THENPOKE36876,0:GOTO230
210 POKE36876,RND(1)*121+135
220 FORB=1TOEB:NEXT
230 E=E+1:IFE<12THEN290
240 IFE<=3THENBE=EB*2
250 IFE>3THENBE=EB*1.5
260 IFE>=7THENBE=EB
270 FORX=1TOBE:NEXT:E=0
280 POKE36874,0:POKE36875,0
:POKE36876,0:POKE36878,0
:FORB=1TOEB/9:NEXT
290 PRINT"[HOME][5 crsr down]
[space][crsr down] +
INCREASES, - SLOWS"
300 PRINT"[HOME][9 crsr down] KEY 1 2

```

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```

OR 3 TOGGLES"
310 PRINT"[HOME][11 crsr down]
[space]VOICE 1 2 OR 3
OFF/ON[space]"
320 GETQ$:IFQ$="GOTO430
330 IFEB=>90ANDEB<=810THENPRINT"[HOME]
[18 crsr down][17 space]"
340 IFQ$="-"THENEB=EB+45
:IFEB>810THENEB=810:PRINT"
[HOME][18 crsr down]
[space]CAN'T GO SLOWER!"
350 IFQ$="+"THENEB=EB-45:IFEB<90THEN
EB=90:PRINT"[HOME][18 crsr down]
[space]CAN'T GO FASTER!"
360 IFF1THENIFQ$="1"THENF1=0:GOTO380
370 IFF1=0THENIFQ$="1"THENF1=1
380 IFF2THENIFQ$="2"THENF2=0:GOTO400
390 IFF2=0THENIFQ$="2"THENF2=1
400 IFF3THENIFQ$="3"
THENF3=0:GOTO420
410 IFF3=0THENIFQ$="3"THENF3=1
420 IFQ$="Q"THEN500
430 IFF1THENPRINT"[HOME][13 crsr down]
VOICE 1 OFF"
440 IFF1=0THENPRINT"[HOME]
[13 crsr down] VOICE 1 ON[space]"
450 IFF2THENPRINT"[HOME]
[14 crsr down] VOICE 2 OFF"
460 IFF2=0THENPRINT"[HOME]
[14 crsr down] VOICE 2 ON[space]"
470 IFF3THENPRINT"[HOME][15 crsr down]
VOICE 3 OFF"
480 IFF3=0THENPRINT"[HOME]
[15 crsr down] VOICE 3 ON[space]"
490 PRINT"[HOME][21 crsr down] Q=QUIT
IT":GOTO130
500 POKE36874,0:POKE36875,0
:POKE36876,0
510 PRINT"[CLR][crsr down][3 space]VIC
RANDOM MUSIC"
520 PRINT"[crsr down] BY PAW-PAW
BARKMAN"
530 PRINT"[2 crsr down][5 space]
COPYRIGHT 1994"
540 PRINT"[crsr down] LYNNCARTHY
IND. INC."
550 PRINT"[crsr down] ALL RIGHTS
RESERVED"
560 PRINT"[4 crsr down]RUN[3 crsr up]"

```

.....end of line.

Text to Screen (VIC 20)

by Ernest Barkman

Gosh, we're glad Ernest got his VIC. Here is an update of his Text to Screen program written specifically for the VIC's 22 column screen. It will read PRG and SEQ files. Make sure you know the name of the file you want to read before you run the program.

Look for this handy-dandy utility on a Spinner near you!



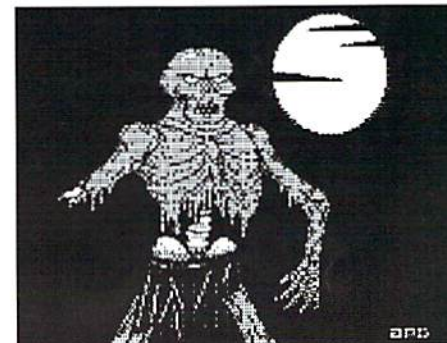
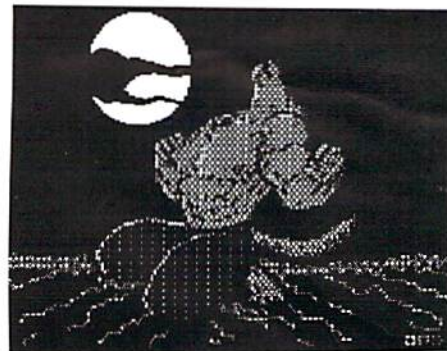
Text to Screen.VIC

```

1 REM A$="TEXT TO SCREEN.V"
:OPEN15,8,15,"S0:"+A$:CLOSE15
:SAVEA$,8:VERIFYA$,8
10 REM COPYRIGHT 1994
LYNNCARTHY INDUSTRIES, INC.
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20 REM TEXT TO SCREEN FOR VIC.
4/23/94. FOR TRISTA BY HER
PAW-PAW ERNIE BARKMAN.
30 REM READS TEXT FILE FROM DISK TO
SCREEN, SEQ OR PRG USING
A[5 space]SIMULATED WORD-WRAP.
40 INPUT"[crsr down]TEXT NAME";SF$
50 PRINTCHR$(14)
60 OPEN2,8,2,CHR$(34)+"0:"+
SF$+"M,R"+CHR$(34):OPEN3,3
70 GET#2,A$:IFSTATUSAND64THEN130
80 IFA$=CHR$(34)THENA$=""
90 IFEB>281THENGOSUB140
100 EB=EB+1:PRINT#3,A$;
110 IFPOS(0)>13ANDA$="[space]"
THENPRINT
120 GOTO70
130 OPEN15,8,15:INPUT#15,E,E$
:PRINTE$:CLOSE15:CLOSE3
:CLOSE2:END
140 IFEB>281THENPRINT"[ctrl 9]
[shift H][shift I][shift T]
[space][shift A][space]
[shift K][shift E][shift Y]
[ctrl 0]";
150 IFEB>281THENGETQ$:IFQ$="THEN150
160 IFEB>281THENPRINT"
[18 crsr right]";
170 IFEB>281THENE=0:RETURN
180 RETURN

```

.....end of line.



Halloween '94
by
John P. Green



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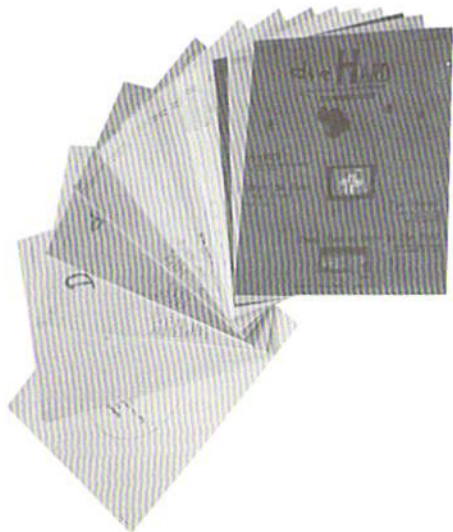
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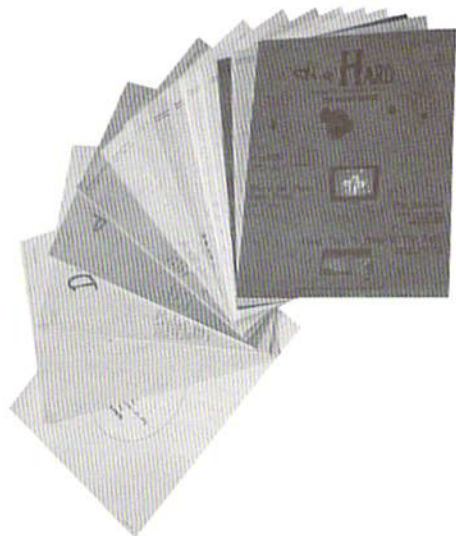
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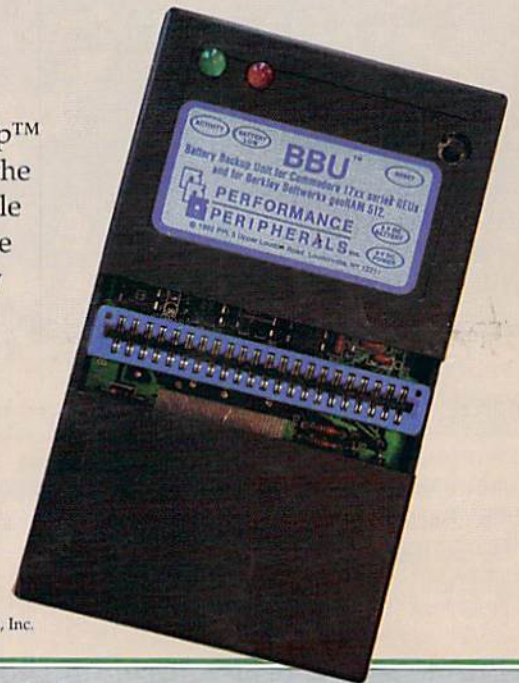
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