

# GEO WORLD

March, 1987

geos file view disk special

open  
duplicate  
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GGEOWORLD V1.87

YOUR FIRST ISSUE

OF GEOWORLD ...FREE!

INSIDE GEOS GEOS REVIEW

GEOWORLD GEOWORLD

# GEOGRAPHOS

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**Graphic Environment Operating System**

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**The new operating system standard for the**

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**Commodore 64**

# GGEOWORLD

March, 1987

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## *As the world GEOS by...*

Welcome Everyone to GGEOWORLD! This newsletter is intended to put GEOS into the world of electronic publishing. I work in the offset printing industry and have seen the impact that the Macintosh and other systems have made. Just before GEOS came out, I was getting ready to "upgrade" from the beloved C=64 to one of these high dollar computers, probably many of You were in the same situation.

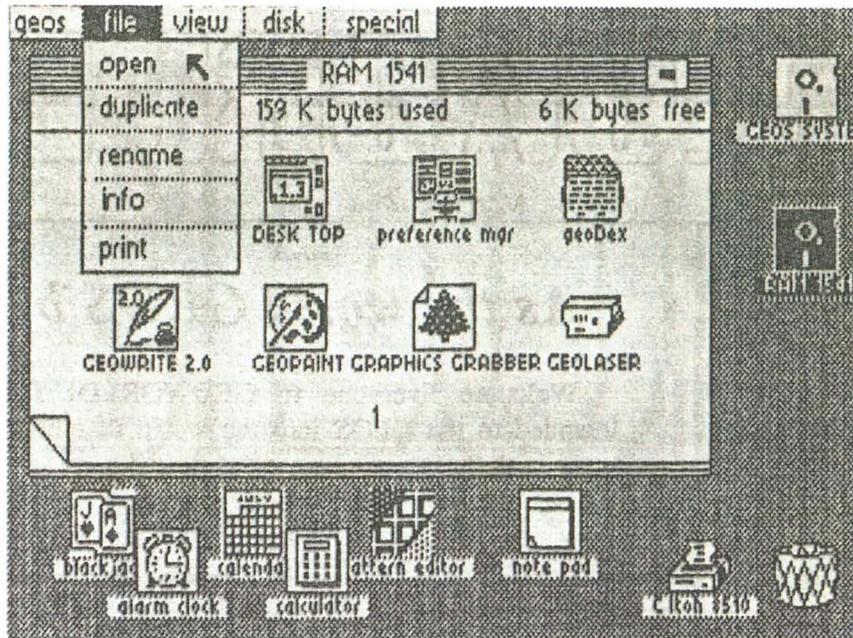
Now that we have an operating system that can produce laser text and graphics the next step will be to advance to the level that equals that of the competition. Of course there are alot of things that GEOS cannot do. But when You compare output from the laserwriter side by side, it is easy to decide on which system will give the most value. This is one thing Commodore has always been good at and GEOS is certainly going to do the same.

While Qlink serves as a very useful tool for the serious GEouser there are many things that the printed word has advantages over a screen. One can spend alot of + time trying to dig out valuable information. The first issue of GGEOWORLD is a group of ideas that have been suggested by the users on Qlink. It contains a monthly column done by M Blaster on programing, GEOS product reviews by Paul and Peter Hughes, downloads of GEOWrite & GEOPaint, and important messages from the tech board. In future issues we will also have GEOS operating tips.

My hope is that GGEOWORLD will be an extension of what users are doing with GEOS. Qlink, GEOS forum, and Email is a very good system ready to be used by GGEOWORLD's electronic publishing. For GGEOWORLD to be succesful it will depend on the users, I am only a printer and can only publish what has been submitted. There is no limit as to size or quantity of GGEOWORLD, it can be made as large as needed to serve our readers. To make it worthwhile for authors to submit material, we are offering \$10.00 per page for their work that is published.

Please keep in mind that this is the first publication and as new ideas are presented, GGEOWORLD will be growing and changing. If You like our newsletter, please subscribe and consider if there is anything that You could submit to share with our other readers.

Roger Ledbetter



## GEOS - A whole new world for the C=64

Review by Peter and Paul Hughes

GEOS is a graphics oriented operating system for the Commodore 64. It is modeled after the user interface popularized by the Macintosh and adapted by the Amiga. GEOS was designed by Berkeley Softworks of Berkeley, California. GEOS disk software is packaged with the new C=64C computers. The basic package includes: GEOS, DiskTurbo, DeskTop, GeoWrite and GeoPaint and desk accessories. The price for the entire package sold separately is \$59.95.

GEOS loads from disk and replaces the Commodore 64's normal operating system. The DiskTurbo speeds up disk drive performance 5 to 7 times on reads and writes.

GEOS displays a Desktop with pop-down menus, icons and windows. The user manipulates an onscreen pointer with a mouse or joystick. Selections are made with a point and click of the mouse. The Desktop simplifies file manipulation by the use of icons and menus.

The Desktop includes desk accessories that can be called up while in another application. Included with the package is a pop-up calculator, notepad, alarm clock, photo and text managers (for transferring data between applications) and a preference manager for setting time, date, cursor shape and speed and screen colors.

GeoWrite is a simple word processor which allows one to create multi-page documents with an assortment of proportionally-spaced fonts in different styles and point sizes. With GeoWrite one can easily insert, copy, move or delete text. One can choose from five different fonts and styles such as bold, italics, outline and underline or any combination of these. By using the photo and text manager, one can easily bring in a picture or text from other documents. The preview page option will allow one to see an image of the whole 8 1/2 x 11 inch page on the screen.

GeoPaint is a full-featured graphics drawing program with horizontal and vertical scrolling that lets one create images as large as an 8 1/2 x 11 inch page at 80 dots per inch. GeoPaint has 14 different tools with which to work. Create lines, boxes and circles which can be filled with a pattern. Paint, fill or airbrush in 32 different patterns. Draw with any of 32 brush shapes. Zoom in for pixel editing or display a preview of the full page. Color with any of 16 colors. Add and reformat text in different fonts, styles or point sizes. The undo feature is very helpful. The ruler is handy for measuring things in pixels or inches. One can copy or move areas of the

screen. Any section of the screen can be mirrored vertically or horizontally, rotated 90 degrees, inverted or cleared. GeoPaint is a sophisticated graphic editor that has many graphics tools for producing any number of high-quality graphic images.

The photo and text managers makes GEOS so integrated. They let one collect pictures and phrases to paste into other applications. The display page feature is very helpful in making decisions about the overall placement and proportions of the document. Both GeoWrite and GeoPaint are WYSIWYG (What You See Is What You Get) screen displays.

Input drivers for the joystick, lightpen, Koalapad and 1351 mouse work in all aspects of GEOS. Printer drivers are included to support over 100 printers.

The GEOS program has been out almost a year and already there is a library of applications and accessories for it.

**Font Pack 1** contains 20 new fonts in several point sizes for use with GEOS. **Desk Pack 1** contains desk accessories such as a Calendar, Icon Editor, Black Jack game, and Graphics Grabber for bringing Print Shop, PrintMaster graphics and ready-made Newsroom Clip Art into GeoPaint.

**Writer's Workshop** includes an improved version of GeoWrite, GeoMerge, GeoLaser and a Text Grabber for importing files from other word processing programs. GeoWrite 2.0 is a professional word processor that includes: center, full and right justification, 1, 1 1/2, and double spacing, decimal tabs, super- and subscripts, headers, footers, pagination, search and replace, keyboard shortcuts, multiple margins and tabs per page and ability to use the NLQ mode of a printer.

**Geomerge** is used for making form letters using Geowrite 2.0 and Geodex. **GeoLaser** is a program that will allow users to print Geowrite documents on an Apple LaserWriter. **GeoDex** is a "Rolodex" card file that can be called up as a desk accessory. One can create mailing labels and autodial phone numbers from it.

**GeoFile** is a free-form database like Filemaker for the Macintosh. One can create forms on a full page. It is very easy to move fields and edit them. A small photo image can be

placed in the database. **GeoCalc** is a full function spreadsheet like Excel for the Macintosh. **GeoChart** is a program that will interpret numerical data from GeoCalc or GeoFile to create bar, scatter, column, line, pie graphs. **GeoSpell** is a spell checker for GeoWrite files.

The **GEOS SIG** is located on **QuantumLink**. QuantumLink is an all Commodore telecommunication network. The software is supplied on the back of the GEOS disk. There users can access the Message boards, Questions and Answers section, access the Laser printing service, download user created GeoPaint files, GeoWrite documents, and user-created applications.

**GeoFont** and **Pattern Editor** were created by a GEOS user. GeoFont will allow one to edit existing fonts or create ones own fonts up to 48 point size. The Pattern Editor is a desk accessory that will allow one to edit the GeoPaint Pattern Set.

The release from Commodore of the 256K RAM/512K RAM expanders for the C=64 and the 512K RAM expander for the C=128 will greatly speed up GEOS operations. These units can be used as super-fast RAM disk.

The C=128 version of GEOS is still in development and is planned to be released for the June CES show. It will have an enhanced 80 column version of GeoWrite and GeoPaint, ability to use the full 512K RAM expander and the 360K double-sided double density mode of the 1571 disk drive for more storage and faster disk access. Also an applications switcher is being considered. This will allow two applications in memory such as GeoWrite and GeoPaint and one can quickly switch between them. Commodore 64 files will be upwardly compatible with the 128 version.. With the ability to integrate text and graphics and have laser printed documents, GEOS is a low-cost answer to Desktop Publishing.

With GeoWrite and GeoPaint one can create professional-looking documents and brochures easily and have fun creating them. GEOS is fast, easy, and very powerful. It is one of the best programs for the Commodore 64. GEOS is truly an amazing package.

BY Master Blaster

Welcome to the wonderful world of Geos! This is the first of a (hopefully) long series of articles on programming within the Geos environment. While a basic knowledge of ML is assumed, you don't have to be an expert to learn from these articles.

To do any serious programming you will need access to one of the Geos reference guides, either the official BSW version (Bantam Books) or the unofficial guide compiled by Alexander D. Boyce. If possible get both! As we move thru the lessons I will be making references to both volumes. All of the equates, constants, labels, etc. which I will refer to will be taken from BSW's book.

Ok, let's get started. Geos is an entirely new operating system for the C-64 (and 128). The heart of the system is the Kernel which resides in memory from \$BF40 to \$FE74. All menus, dialog boxes, sprites, icons, etc. are controlled by it. An application gives the Kernel the necessary info (how many icons, where to place them, etc.) and the Kernel does the rest. This makes programming much easier as most of the complicated coding is taken care of for you.

One concept a Geos programmer must understand completely is that of 'an event'. Geos is by and large event driven. Events are defined as user actions (clicking, pressing a key, etc.) or timed events. Timed events will be discussed in detail in a later article. For the most part an application tells the kernel what menus to display, what icons to draw and what to do if a user clicks in those areas (and possibly outside of those areas). That's about all there is to the main body of the application! The rest is up to the Kernel. When a user clicks on an icon for example the Kernel will execute the routine the application told it to. But before that happens the application isn't running; the Kernel is doing all the work. In fact an application is really nothing more than a series of subroutines (in reality it can get a bit more complicated than that but for now I just want you to get the 'big picture').

The part of the Kernel I'm referring to is called the Main Loop (original, no?). Its sole purpose in life is to check for events and execute the proper routine when one occurs. The programmer has many options when coding these routines. Writing an application can be broken down into four basic steps:

**1) DECIDE ON THE PURPOSE OF THE APPLICATION** in basic terms. Will you need to access the disk or printer? How complex do you want it to be (resist the temptation to 'kill an ant with a sledge hammer'). The simplest solution to a problem is always the best one.

**2) DECIDE ON THE CONTROL STRUCTURES.** Will you need icons? How many? Where will they be placed on the screen? How about menus? Submenus? Special graphics? Now is the time to decide what the user will see and how the program will interact with him (or her). Notice that you haven't actually started coding yet -- first you must decide what to code!

**3) CODE THE CONTROL STRUCTURES AND DEFINE THE EVENTS.** Ok, now we start coding. Define all the menus and icons. These are simple table structures. It is usually easier to test these with dummy service routines. Once you get the menus, etc. coded, you can run the application and make sure that everything works the way you want it to. As we will soon learn, menus and icons are hit and miss propositions. You keep tweaking them until the size, shape, etc. is to your liking. Ensure everything's correct before you go on to...

**4) CODE THE SERVICE ROUTINES.** Now it's time to write the code for the routines that occur when a user clicks an icon or selects a menu option. Any background routines must be written. All the loose ends tied up (and there will be plenty of them) this is the hardest part to code and the hardest part to debug. Take your time.

Before we start on any actual Geos programming we must first explore the ways in which Geos stores files on the disk. The format is slightly different than the standard Commodore DOS therefore some kind of conversion process is necessary in order for your programs to run.

Track 18, block 0 contains the BAM just as in the C-64 DOS. However there are some additions to the rest of the block. Locations 144-159 contain the directory header (BSWRG p 236). There are three new items of interest here: the Off Page Directory Block (OPDB) pointer, the Geos ID string, and the protection byte.

The OPDB is a block that is allocated when the disk is formatted or converted to Geos format. This block is identical to a directory block and is used to hold the directory entries of the files placed on the Desktop border. This is the reason you can only place eight files on the border; that is all a single block will hold. The pointer to this block is at offsets 171 and 172.

The Geos ID string comes next and takes the form: "GEOS format V1.3". This string is used to tell the Desktop whether or not a Geos disk is in the drive. The version number (V#.#) is not used to make this check. It can be used to tell an application what version of desktop created the disk.

The protection byte is at offset 189, just after the ID, and is used to tell the Desktop (Version 1.3 and up) whether a Master Disk is in the drive. Master disk's have an unshifted 'B' here while regular disk's have a zero (that's a true zero, not an ASCII zero). The Desktop will not let a user scratch files from or format a master. You can scratch a file, however, by moving it to the border first.

A directory entry is similar to the regular Commodore entry with several additions. The following example of a directory entry is in screen codes which is a common format for disk doctors:

```
c sc MY PROGRAM      hd @f Wabcd m@
-entry
0 12 3456789012345678 90 12 34567 8 9
-offset
```

The C-64 filetype, the track & block pointer, and the filename are identical to a regular entry. Note that *all* Geos files are type USER. Next there is several new bytes. The first two (bytes 19 and 20) are a pointer to the file's header block (more on this later). Next comes the file structure, zero for SEQUENTIAL and 1 for VLIR.

Do not confuse a SEQ structure with the commodore file type. At offset 22 is the Geos file type. Applications will have a six here. Next is the year, month, day, hour, and minute that the file was last modified. The last two bytes are the size of the file, including header block, low byte first. The above example then would indicate that this is a USER file called 'MY PROGRAM' that begins in track 19, block 3. The Header block is in track 8, block 4. It has a SEQUENTIAL structure and is an Application that was last modified on 1/2/87 at 3:04 AM. The file is 13 blocks long.

By the way the time is stored in 24 hour (military) format. Hours 13 to 24 can be converted to regular format by subtracting twelve and setting a flag to indicate PM.

Next we'll take a quick look at the two types of file structures. Do not confuse these with a file's TYPE, they are two different things. Structure is how the file is stored and type is what the file is used for. A SEQUENTIAL file structure is similar to the old C-64 PRG files; a chain of blocks with the first two bytes of each block pointing to the next one in the chain. A track pointer of zero indicates the end of the file and the block pointer of this block indicates the number of valid bytes. This is necessary because the last block is almost always short. There is one big difference in this structure, the first two bytes *do not* indicate the loading address for the file, that is stored elsewhere. Most assemblers put this address in automatically but there are ways around this as we will learn.

VLIR stands for *Variable Length Index Record*. This is a brand new construct for the C-64. The file entry in the directory points to the VLIR header block. This block is composed of a two byte block link (which is normally 0,255 because there is only one header block --

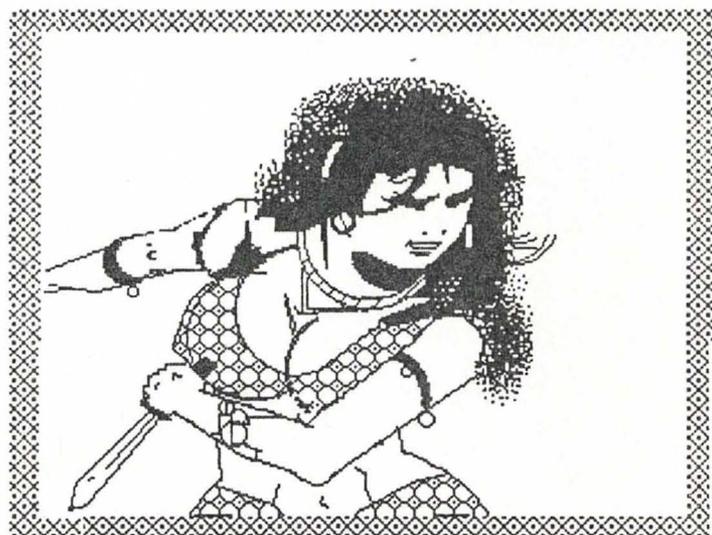
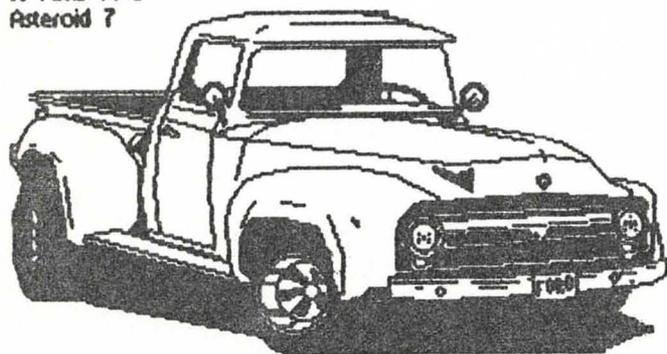


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01-18-87

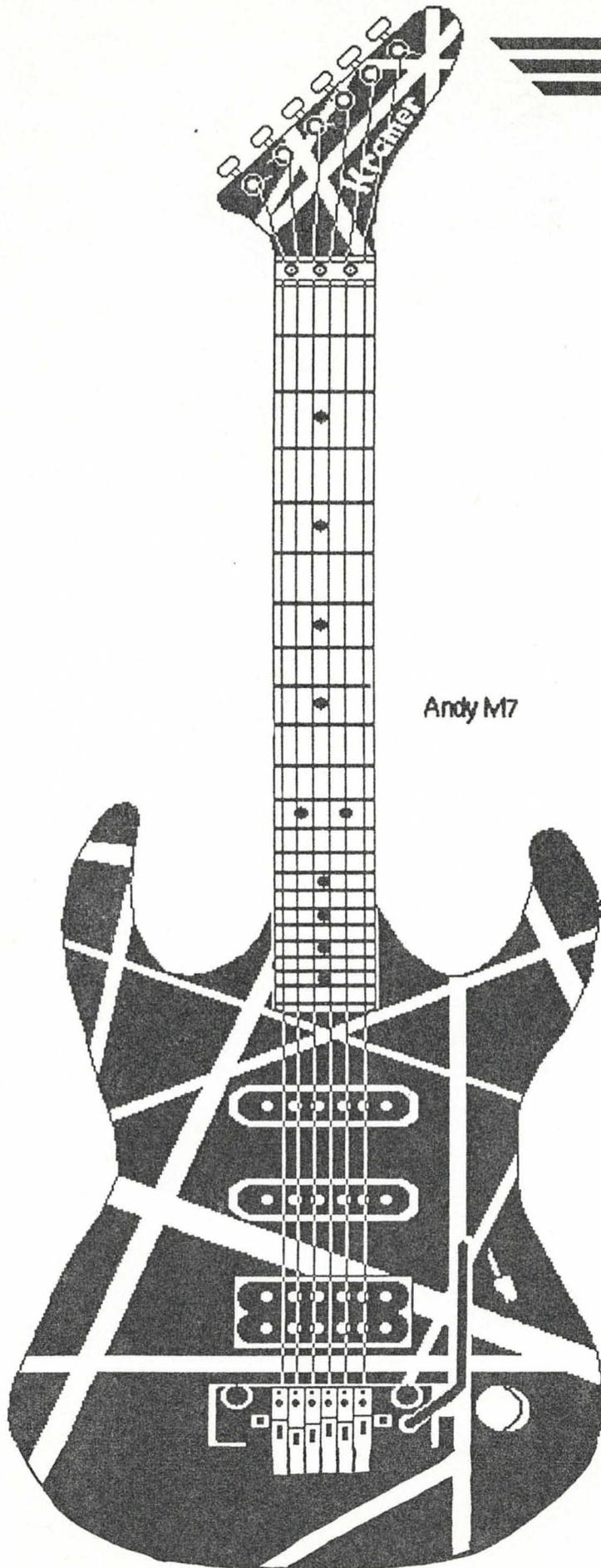


Bob Lupo

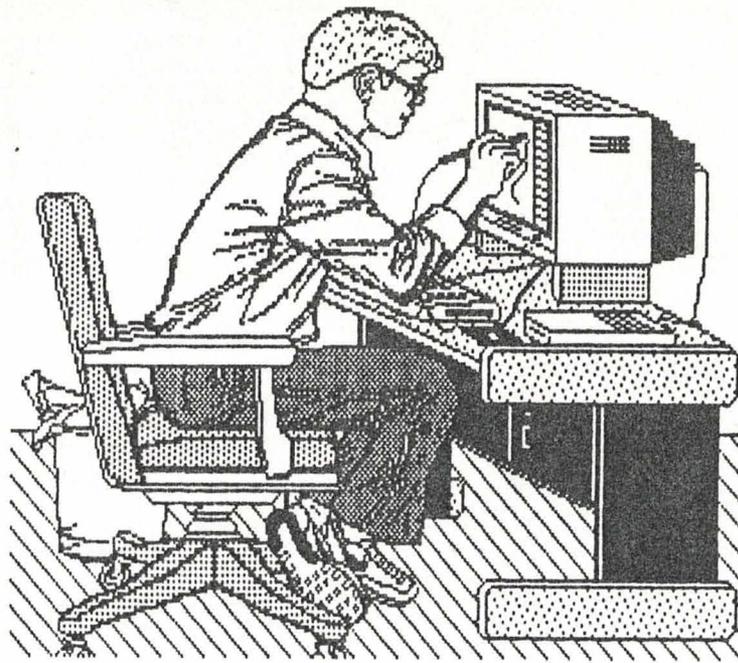
55 FORD P/U  
Asteroid 7



Red Sonja!  
By Asteroid 7.



Andy M7



## Light Pens

from Mystic Jims Shareware Disk

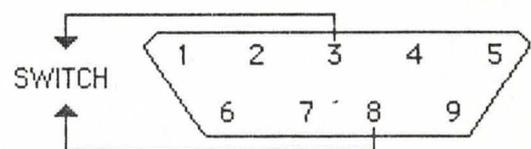
The lightpen is an ideal input device for GEOS, with it's icons and pull-down menus; just point at the item you want, and "click", it's selected. Used with GEOPaint, it can almost be like drawing with a real pen, right on the screen. Realizing this, BSW has provided a driver for the Flexidraw Inkwell Lightpen system. The problem is that there are many other kinds of lightpen, and the Inkwell driver works with none of them. his disk provides ways to use ANY lightpen with GEOS; this disk includes the Inkwell driver, plus a generic lightpen driver, "Lightpen", that works with any lightpen that has a "click" device, such as a touch-ring, or tip-button. Some of the most popular lightpens have no "clicker" at all, and GEOS requires one, so there is a driver that works with the RUN/STOP key as the clicker. Also, along with the input drivers, we have added directions for adapting any "clickerless" lightpen to work with the Inkwell driver.

The Flexidraw lightpen has a momentary switch wired between pin#3, the joystick-left, and pin#8, the ground pin. The lightpen diode itself is wired between pin#6 and pin#8. To emulate the Flexipen, a switch must be added to the clickerless pens. Here's how:

1. Obtain a small, momentary-contact, normally-open, single-contact, single-throw switch; a reed switch works well. Get a length of two-lead wire about as long as the cord on the lightpen. Light speaker wire is ideal.

2. Open the plug, and find pins three (3) and eight (8).

Looking from the back of the plug.

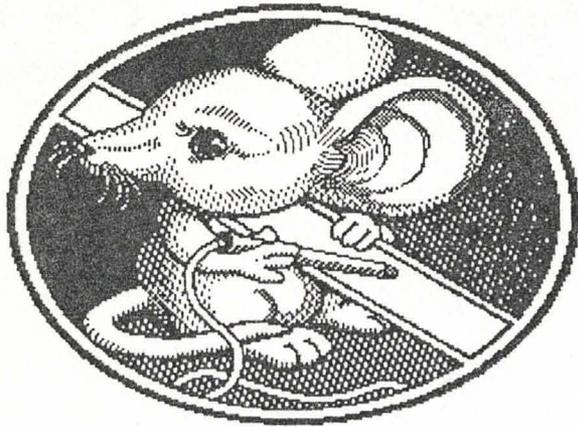


3. Solder one end of a wire to pin three (3), and solder the end of the other wire to pin eight (8). Lead the wires out through the back of the plug.

4. Solder the other ends of the two wires to the switch.

5. Mount the switch at a convenient point on the barrel.

6. Be sure there is are no bits of wire or solder there, and close the plug. Carefully and thoroughly insulate all solder joints with shrink-tubing or tape.



There is a neat way to wire Edumate lightpens, which may apply to other pens as well. You will need a short piece of wire and a small switch, as above:

1. Open the plug of the lightpen.
2. Find pins three (3) and eight (8), as before.
3. In most Edumate pens, there is an extra wire in the cord that is not used; that wire can be used for the switch. It's usually blue. Find that wire. If there is no wire, you must use the previous procedure.
4. Solder the end of the (blue) wire to pin#3.
5. Find pin #8 (eight), and note the color of its wire: it's usually black
6. Carefully slice open the outer insulation of the cord right at the base of the lightpen barrel, without damaging the wires inside.
7. Find the extra (blue) wire, and the ground (black) wire.
8. Solder the end of the (blue) wire to the switch. If the (blue wire isn't long enough, use the short piece of wire as a jumper.
9. Carefully scrape some of the insulation from the ground (black) wire, without cutting the wire itself.
10. Solder a short piece of wire to the exposed (black) wire, and solder the other end to the switch.
11. Thoroughly insulate the solder joint, and reclose the insulation around the cord.
12. Reassemble the plug.
13. Mount the switch on the barrel of the pen.
14. It's a good idea to test all your wiring for continuity and shorts.

That's it ! Light pens fixed this way work just like Flexidraw pen with the Inkwell, or Lightpen input drivers.

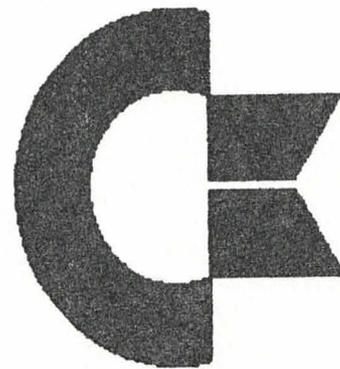
## Inside GEOS

however I have a feeling that GeoFile will use several) then 127 two byte pointers. These pointers point to *records* which are numbered from 0 to 126. Each record is a series of sequential blocks. What is contained in these records depends on what the file is. A VLIR file is simply a way of grouping a several Sequential files together under the same filename.

GeoWrite is a VLIR file, the first record is the main program and the rest (most applications won't use them all -- a pointer of \$00,\$FF is an empty record) are subprograms that can be swapped in and out at will. This is why certain commands access the disk when they are selected.

GeoWrite documents are also VLIR. Each record is a separate page. Only the first 64 records are pages, however. The last 63 point to any photo scraps that the document contains. Version 2.0 uses records 61-63 for the header, footer, and future expansion respectively. By the way this is a good example of the difference between a file's type and its structure; GeoWrite is an *Application* that is stored in *VLIR* format.

Well that's about all the room we have for this time. In my next article I will discuss a file's Header Block and then we'll begin learning how to convert programs to Geos format. Programming examples will be provided to help you get started. Hope to see you there. MB



## Questions & Answers

**QUES: System Error**  
FROM: KenN4

I have a problem with Geos printing. When I use GeoWrite everything goes well until I go to file and click on print. Most of the time I get a card that says "Error reading disk". I've moved my document to another work disk and I still get the same card. If I reboot the master disk I get a card that says "System Error" with a "\$" and a number after it. When I reset the computer and disk and reload Geos, just before I get the desk top I can still see the System error card on the Hi-res screen that comes up first. I am using version 1.2 with a 1541 drive and a mps801 printer.

**ANS: It happened to me**  
FROM: LarryW13

I took the hint from the message boards. Rob sez you should delete a printer file from your master disk, AFTER you've made a backup copy. The file deleted should be a printer you will probably never use. Once you make room on your master disk to do some file-moving, rearrange the order of the printer files so that the first one GEOS sees on bootup is the printer file you will be using. Then make sure that this same printer file is the only one (first one?) on your work disks. I hear that when GEOS boots, it loads the first printer driver it finds on the boot disk. All you need to do is arrange things so that the first one it finds is the one you want to use!

I had many problems with system errors around \$10141 or something like that; I was having problems because some work disks would print, some would not. Was moving files from disk to disk so they could be printed... was angry and frustrated. Grrr!

Since I rearranged the printer drivers, this hasn't happened once! Lots of luck on doing the same!

**QUES: Copying Work**  
FROM: Stan7

Can anyone tell me if its possible to copy a report from Geowrite, onto a blank non-Geos disk and how is it done?????????

**ANS: Yes, but ...**  
FROM: Greg K

If you have two disk drives, then you can copy back-and-forth between GEOS and Non-GEOS disks without doing anything different for the Non-GEOS disk! If you have only one drive, then you can copy from a GEOS disk to a Non-GEOS disk, but you cannot copy back in the other direction!

(1) With one drive:

Put in and open the GEOS disk (from the deskTop). "Click" on the file that you want to copy, wait a moment and click again. Move the "ghost" icon from the "disk pad" down to the desk top and click to leave it there. Take out that disk, put in and open the Non-GEOS disk. Click on that icon that you just moved, move it up onto the disk pad, and click. You will get two windows that tell you when to put each disk back in the drive. Obey them and click on the "OK" box. (Make sure that the two disks have different names!)

(2) With two drives:

Open the disk drive with the disk which has the file. Click on that file's icon, wait a moment and click again. Move the ghost icon over to the icon of the other disk drive. When you click, the file will be copied.

**QUES: Delete Graphics**  
FROM: D 000

I can paste a graphic to Geowrite but I can't place it where I want to in the messAge nor can I delete it. What do I have to do?

**ANS: to move and delete...**  
FROM: TBirdTurbo

Moving and deleting graphics is fairly easy - if you know how to do it!

Using geoWrite 1.2 or 1.3 (the ones supplied on your GEOS disk), the only way to move a graphic is to re-define the margins for the entire page. Photo scraps are centered between the margins.

Using geoWrite 2.0, you can re-define the margins for just the graphic, making it easy to move the graphic to the left or right of the page, and still have text stretching all the way across.

You can delete a graphic in two ways:

1.> Position the cursor directly after the graphic and press the DEL key, the offending graphic will be deleted just as any character would.

2.> Select the area containing the graphic and CUT it using the EDIT menu.

Either way will work.

**QUES: Pick area growth??**  
FROM: RPS

I dunno if this is an 'enhancement' or just a bug. I bought a 1351 Mouse and upgraded my GEOS files per the instructions. Now when I use GeoPaint and try to pick or select an area to copy/move/clear, etc. The box grows about 5 pixels bigger when I click the mouse. I used to be able to pick the exact area I wanted, then copy or move it without a blanked border. This seems to make pick areas nearly useless except for gross editing. HELP!

**ANS: Turn the color off,**  
**FROM: GEOS ROB**  
and the jumping will stop. It is trying to meet the 8x8 pixel card boundaries.

---

**QUES: Programming GEOS**  
**FROM: Lord Crue**

I have seen many user written programs for GEOS.. But I need some help in making my own.

**ANS: GEOS programming**  
**FROM: Khan1**

I managed it with "GEOS Inside and Out" from Abacus and the unofficial Reference Manual by Alexander Donald Boyce downloaded from here. I used:

- these two manuals
- Icon Editor (from deskPak)
- a disk editor
- a good assembler (Merlin)

You have to assemble your program, give it an icon, and change the load/end/start addresses AND file type (to Application or Desk Accessory) before it will work... I'm planning to write geoConfig to do this for programmers.

**ANS: Get Books**  
**FROM: PixLMaster**

To program GEOS you will need:  
a very good assembler a very good book to help you program in machine language  
a GEOS book (The Official Geos Programmer's Reference Guide ,Bantam Books, ISBN 0-553-34404-8,\$19.95)

---

**QUES: 1700ram/GEOS**  
**FROM: Leedit**

Is anyone out there using a 1700/1750 ram expander with a C128 in 64 mode? I'm interested in your experiences with that configuration. thank you.

**ANS: 1750 Great**  
**1700 not so good**  
**FROM: ErrolK**

1750 gives you a shadow disk, a full emulated 1541 and fast scrolling in Geopaint. The 1700 just gives you the fast scrolling

**ANS: The 1750 is GREAT...**  
**FROM: UPBEAT**

just be sure you get the 1.3 system upgrade which comes with the 1351 mouse.. the two together made for a great system!!!

---

**SUBJ: Ram Expansions...**  
**FROM: GEOS TECH**

In response to questions about ram expansion devices and how GEOS treats them:

Commodore has three ram expansion products:

- 1764: 256K for the C64 only, you can plug in and solder extra ram chips to get up to 512K. Contact CBM for availability.
- 1700: 128K for the 128.
- 1750: 512K for the C128.

(Those with a knack for soldering might be able to get their 1700/1750's to work with the C64...)

GEOS V1.3 is the first version of GEOS to support any type of ram expansion.

Once you boot, run the configure program to specify how your expansion will be used. The first 64K of expansion ram is ALWAYS used to speed up the MoveData routine, provide fast reboot, and for misc. system stuff.

Then, depending on the size of your expansion and what you select using the configure program, you can enable any one of the following:

- 1) 1541 ram disk drive (uses 192K)
- 2) 1541 shadow drive (uses 192K)
- 3) 1571 ram disk drive (uses 384K!)
- 4) 1571 shadow drive (uses 384K)

(The configure file which supports the 1571 is not yet available- stay tuned.)

To those who have not yet seen GEOS run with a ram expansion unit, I cannot express to you how FAST things run!

**FROM: GEOS TECH**

1: We currently have 17 programmers working on various projects, we all live in the same area and work in the same office and share a lot of code. When the original GEOS program was developed we only had 5 programmers.

2: We develop our code on an ISI UNIX system. This is a lot like a SUN microsystems UNIX box if you are familiar with that product. We use cross-assemblers that we wrote ourselves and we download the assembled code to the C64. We are however developing a similar development environment that will run on a C64/128 and provide the same assembly and debug tools we use. This product will be called geoProgrammer.

3: The 128 version is almost complete, however a lot of manual and packaging work still has to be done on the marketing side. This product is HOT. Most applications are implemented in both 40 & 80 column modes. Both write and paint allow the full width of the document to be displayed. The 1571 disk turbo code uses the hardware clocking and is twice as fast as the old turbo code. Look on the general boards for more info on the 128.

**SUBJ:Announcing...**  
**geoProgrammer!**

**FROM: GEOS TECH**

We are currently working on a product we are calling geoProgrammer. This package will include an assembler, a linker, and a debugger so that you, too, can create C64/GEOS programs in a powerful and flexible environment! We are announcing it here to let you programmers know that such a product will be coming into the GEOS collection in the future. As soon as we can, we'll release more information about this.

# GEOLASER FONTS

complements of Telegraphics

## GEOS Fonts

LW\_\_ Roma  
 LW\_\_ Cal  
 LW\_\_ Greek  
 LW\_\_ Barrows

## Laserwriter Fonts

Times Roman  
 Helvetica  
 Symbol  
 Courier

LW\_ Roma plain

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567890

**LW\_ Roma bold**

**ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz12**

*LW\_ Roma Italic*

*ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567890*

LW\_ Roma Outline

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

LW\_ Cal plain

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz123456

**LW\_ Cal bold**

**ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz12**

*LW\_ Cal Italic*

*ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz123456*

LW\_ Cal Outline

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

LW\_ Barrows plain

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567

**LW\_ Barrows Bold**

**ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz12**

*LW\_ Barrows Italic*

*ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567890*

24 point 18 point 14 point 12 point 10 point 9point