GEOS User's Manual

Version 1.2

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Welcome to GEOS

Your new Graphic Environment Operating System (GEOS) ushers in a "whole new world" for your Commodore 64® or Commodore 128™. GEOS brings to you the power and ease of use that icons, windows, and pop-down menus provide. A simple click of the joystick is all it takes to get the job done.

This manual is divided into eight chapters:

1: **Before You Begin Working** guides you through the initial processes of installing GEOS, booting GEOS, and making **Work** disks.

2: **GEOS Training Camp** introduces you to the basic techniques necessary to manage disks, files, and GEOS applications.

3: **GEOS deskTop** describes your interface to the disk operating system.

4: **geoPaint** is a powerful color graphics editing program.

5: **geoWrite** is an easy-to-use, "what you see is what you get" word processor.

6: **Desk Accessories** are smaller applications that perform handy functions while on the deskTop or in applications.

7: **Troubleshooting** lists standard error messages and solutions to common problems.

8: **QuantumLink** is a user's guide to the telecommunications network for Commodore owners.

Contents

Chapter 1: Before You Begin Working

This chapter will guide you step by step through the procedures for:

- Installing GEOS
- Booting GEOS
- Making Work Disks

At the end of the chapter is a Disk Directory, which allows you to quickly locate the contents of your two GEOS disks.

Please read and follow the directions in the next section .

Installing GEOS

You will follow these steps only the *first* time you use GEOS! Once you have installed GEOS using this procedure, follow the steps in the next section, "Booting GEOS," each time you boot GEOS.

Your GEOS package includes two disks: the **System** disk, and the **Backup System** disk.

1. Set up your computer and disk drive according to the instructions found in the Commodore manual. The screen should be blue and the word READY should be displayed.

NOTE: If you have a Commodore 128, you must power up in the C64 mode as follows: Whitle holding down the Commodore key (the key at the lower left corner of the keyboard), switch on the power, then release the key. The display should read "Commodore 64." (If not, turn the power off and try again, holding the Commodore key down a little longer.)

NOTE: If you have *two* disk drives, leave one turned off for this procedure.

2. Connect a 1350 mouse or joystick to port 1 (the port closer to the front of the machine).

3. Insert the disk marked **System** into the disk drive. Close the door to the drive.

4. Type **LOAD "GEOS",8,1** on the Commodore keyboard and press RETURN. The disk drive will activate and a dialog box will appear asking:

   Please insert disk:
   Backup System

5. Remove the disk marked **System** and insert the disk marked **Backup System** into the disk drive.

6. Select OK (or press RETURN on the keyboard). The disk drive will activate and a dialog box will appear asking:

   Please insert disk:
   System

7. Remove the disk marked **Backup System** and insert the disk marked **System**.

8. Select **OK** (or press RETURN). The disk drive will activate and the system will boot up. Before the dialog box appears, the screen will display:

   Booting GEOS...

   After a few moments the GEOS **deskTop** will appear.

Disk Menu
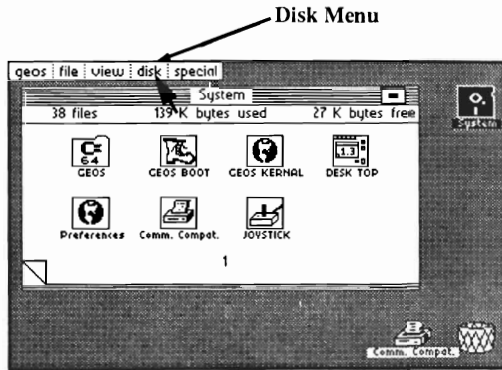
9. Now close the **System** disk by moving the blue pointer with the joystick to the box marked **disk** at the top of the screen.

10. Press the **fire button** on the joystick. You will see a list of commands.

11. Move the pointer over the box marked **close.** Press the **fire button.** The deskTop will clear.

12. Remove the **System** disk from the disk drive.

You should now turn to the section, "Making Work Disks" on page 1-6.

Booting GEOS

These steps describe how to **boot up** GEOS. Follow these procedures each time you boot up.

1. Set up your computer and disk drive according to the instructions in the Commodore manual. The screen should be blue and the word **READY** should be displayed.

NOTE: If you have a Commodore 128, you must power up in the C64 mode as follows: While holding down the Commodore key (the key at the lower left corner of the keyboard), switch on the power, then release the key. The display should read "**Commodore 64**." (If not, turn the power off and try again, holding the Commodore key down a little longer.)

NOTE: If you have *two* disk drives that are set to the same device number, leave one drive turned off for this procedure.

2. Connect a 1350 mouse or joystick to port 1 (the port closer to the front of the machine).

3. Insert the disk marked **System** into the disk drive. Close the drive door.

4. Type **LOAD "GEOS",8,1** on the keyboard. Press the RETURN key. The disk drive will activate, and the screen will display:

    Searching for GEOS

    Then:

    Loading

    After a moment the screen will display:

    Booting GEOS...

    In a few moments the **deskTop** will appear on the screen as shown on the next page.

5. Now close the **System** disk by using the joystick to move the blue pointer to the box marked **disk** at the top of the screen.

6. Press the **fire button** on the joystick. You will see a list of commands.

7. Move the pointer to the box marked **close**. Press the **fire button**. The **deskTop** will clear.

geos | file | view | disk | special

open ⌘ O

close ⌘ C

rename

copy

add drive

validate

format

38 files

27 K bytes free

CEOS

CEOS KERNAL

DESK TOP

Preferences

Comm. Compat.

JOYSTICK

System

1.3

System

1

Comm. Compat.
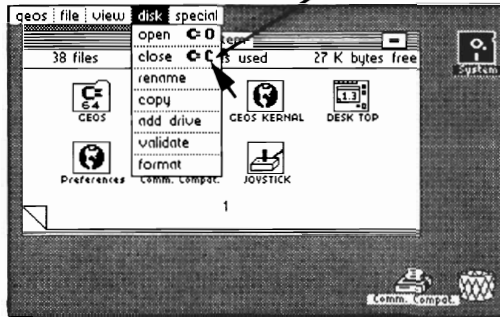
8. Remove the **System** disk from the disk drive.

NOTE: Use the **System** disk only for booting; use **Work** disks after you boot up.

You can now use GEOS applications (geoWrite, geoPaint) by inserting a **Work** disk into the disk drive and opening it. But first you must make a work disk. (See the next section, "Making Work Disks.")

Making Work Disks

Before you start working with GEOS applications, you should make one or more **Work** disks containing the GEOS applications that you want to work with. The steps below will guide you through making **Work** disks. Make at least one **Work** disk now.

NOTE: If you have two disk drives, you can greatly speed up this procedure by enabling your second drive and using it to help copy your **Applications** disk. (See **Using Two Disk Drives** in **Chapter 3.**)

1. After you have booted GEOS (see previous section, "Booting GEOS"), insert the flip side of the **Backup System** disk, marked **Applications**, into the disk drive.

2. Now open the Applications disk by using the joystick to move the blue pointer to the boxed marked **disk** at the top of the screen.

3. Press the **fire button** on the joystick. You will see a list of commands.

4. The pointer will be at the box marked **open**. Press the **fire button**. The Applications deskTop will appear on the screen.

Disk Copy Icon
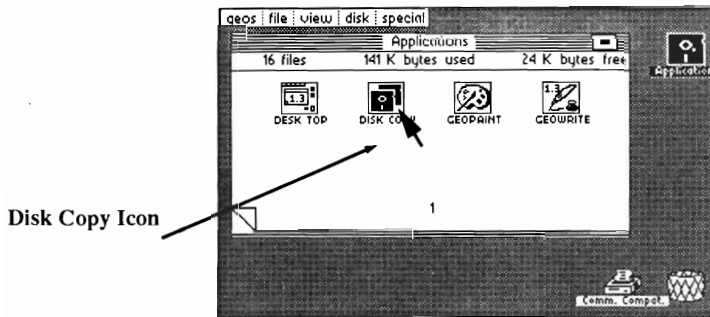
5. Move the pointer to the picture of the two disks on the deskTop marked **Disk Copy**. Press the **fire button** once.

6. Now move the pointer to the box marked **file** at the top of the screen. Press the **fire button**.

7. A list of commands will appear. The pointer should already be at the box marked **open** in the list. If not, move the pointer there. Press the **fire button**. The screen will turn blue and the following message will appear:

   DISK COPY UTILITY

   PLACE DISK TO BE COPIED IN DRIVE
   AND PRESS RETURN TO CONTINUE

8. The disk that you want to copy (Applications) is already in the disk drive, so simply press the RETURN key. The disk drive will activate and the following message will appear:

   READING SOURCE DISK...

   After a moment the following message will appear:

   PLEASE INSERT
   DESTINATION DISK
   AND PRESS RETURN TO CONTINUE

9. Remove the disk marked Applications (the Source disk) from the disk drive.

10. Take a new disk and put the following label on it: **Work Disk 1** (this is to be your first **Work** disk).

11. Insert **Work Disk 1** (the Destination Disk) into the disk drive, and press RETURN. The disk drive will activate and the following message will appear:

    FORMATTING DESTINATION DISK...

    Then after a moment, this message appears:

    WRITING DESTINATION DISK...

    After a few moments the following message will appear:

    PLEASE INSERT
    SOURCE DISK
    AND PRESS RETURN TO CONTINUE

12. Take the disk marked **Work Disk 1** out of the disk drive, and re-insert the **Applications** disk. Press RETURN.

13. Continue to follow the directions on the screen, swapping the two disks in and

out of the disk drive as directed. (This will take about two more swaps.) At
the end of this sequence, the following message will appear:

BACKUP COMPLETE!
MAKE ANOTHER COPY?
PRESS 'Y' FOR YES, 'N' FOR NO.

14. Press 'N.' The following message will appear:

PRESS 'B' TO RETURN TO BASIC, OR
INSERT GEOS BOOT DISK
AND PRESS RESTORE

15. Remove the disk marked **Applications** from the disk drive and insert the
disk marked System. Press the **Restore** key. The disk drive will activate,
GEOS will re-boot, and the **System** deskTop will appear on the screen.
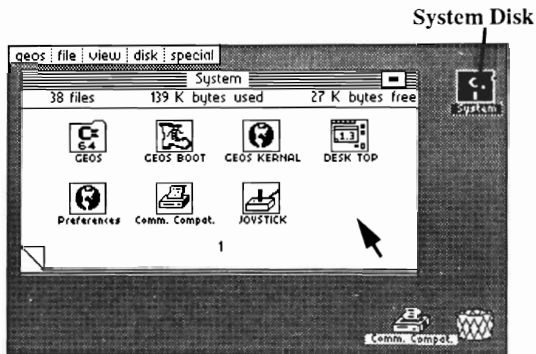
16. **Important!** Store the disk marked **Backup System** (and marked **Appli-
cations** on the the other side) in a safe place. Use your **Work Disk 1** for
GEOS applications, and to make additional **Work** disks. Use the **Backup
System** disk to boot GEOS *only* if your **System disk** is damaged. Use
the **Applications** disk to recover files that you may lose off of your
System disk (that is, printer drivers or fonts).

You are now ready to proceed to **Chapter 2: GEOS Training Camp.**

NOTE: You can make additional Work disks by copying Work Disk 1. Use the
GEOS **System** disk only to *boot* GEOS! Otherwise, use Work disks.

Disk Directory

GEOS is packaged as a two-disk system. The following table is a quick reference of both disks, allowing you to quickly locate any GEOS file.

Disk A:

Side 1: **System Disk**
System Boot files (GEOS Boot, Kernel, deskTop)
Printer Driver
Input Drivers
Preference Manager

Side 2: **QuantumLink**
QuantumLink System files
GEOS to CBM Converter

Disk B:

Side 1: **Backup System Disk**
System Boot files (GEOS Boot, Kernel, deskTop)
Printer Drivers
Input Drivers
Preference Manager

Side 2: **Applications Disk**
deskTop
geoWrite V1.3
geoPaint V1.2
Font files
Desk Accessories (preference mgr, alarm clock, photo mgr, text mgr, calculator, note pad)
Disk Copy Utility

Chapter 2: GEOS Training Camp

geos world icon
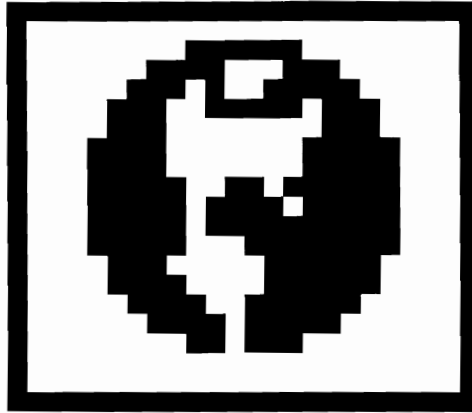
This chapter will introduce you to GEOS, the Graphic Environment Operating System. GEOS is both easy and fun to use. After reading this chapter you will have the basic techniques necessary to use GEOS. This chapter explains:

- System requirements for GEOS
- Terminology used in GEOS
- Fundamentals of windows, pointing, and clicking
- How to open, close, and rename a disk
- How to tailor a work disk
- How to enter geoPaint and geoWrite
- How to set up your printer
- Choosing an input driver
- General do's and don'ts
- How to set up your printer interface

System Requirements for Training Camp

This chapter is written assuming the following system setup:

- One C-64 or C64c (or C128 running in C64 mode)
- One 1541 disk drive
- A joystick
- Other input device
- A Commodore-compatible printer.

Important: If you are using an input device other than a joystick, you should read the "Selecting Input Device" section in **Chapter 3**. Follow the directions there to set your input device as the default device on your system disk. You cannot continue with the Training Camp (or use GEOS applications) until you have done this.

If you have two disk drives, hook up only one for **Training Camp.** Be sure to turn to the **deskTop** chapter to learn all of the additional features available to you as the owner of two drives.

If you own a Commodore RAM Expansion Unit (REU), do not plug it in to your system. This section assumes that you have not yet installed the RAM expansion KERNEL on your boot disk. After you have completed **Training Camp** you can follow directions for installing the RAM expansion unit and the REU GEOS KERNEL that you received with the unit itself.

The RAM expansion unit, under GEOS control, is probably the single greatest performance booster you can purchase for your Commodore. The speed and ease with which applications run on the RAM device is so amazing that we at Berkeley Softworks believe that all Commodore owners will want to purchase the RAM device once they have seen the performance difference. For more information on the RAM Expansion Unit read the section on the REU in the **deskTop** chapter on page 3-17.

Let's Get Our Terms Straight

This section defines a number of words and phrases used throughout the manual to describe various features of the GEOS system. Many of the terms are followed by examples of how they would be used in context within the manual. You **should not** try to execute these examples at this point. The examples are only given to help define the terms.

Menus, Sub-menus, and Icons

A **menu** is just what you might guess: a list of **items**. A menu might be used to list commands, desk accessories, fonts, or any of a number of items. For example, on the **deskTop** screen, the command menu lists: **geos, file, view, disk,** and **special**. This is a **menu** of commands available from the **deskTop**.

Often, selecting an **item** in a **menu** causes another menu to appear. The new menu that pops up as a result of selecting a menu item is called a **sub-menu**. Sometimes selecting a sub-menu item causes yet another menu to appear, this menu is also refererd to as a sub-menu. GEOS allows an indefinite sequence of sub-menus–a menu may have a sub-menu, which may have another sub-menu, which may have yet another sub-menu, etc. However, you will rarely encounter more than two levels of sub-menus appearing. For example, if you select file in the command **menu**, a **sub-menu** will appear listing commands that may be performed on a selected file, as shown below.

Command Menu⟶

File Sub-Menu
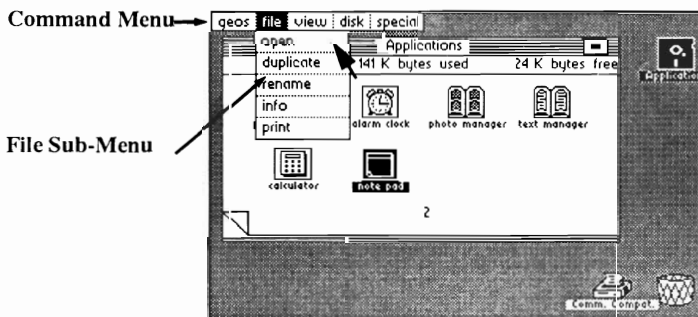
The white area labeled applications in the figure below is the **Disk Notepad.**
The eight small images shown on the Disk Notepad are **icons.** The printer and
waste basket in the lower right and the applications disk are also icons.

An **icon** is simply a picture used to represent an object, a tool, or a command.
The pictures appearing on the Disk Notepad represent the files on the disk; the
picture of a printer at the bottom of the screen represents the printer you have
connected to your computer.
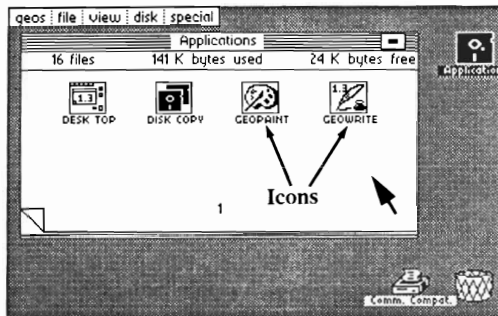
Dialog Boxes

Often, a program needs to get a piece of information from you before it can proceed. In GEOS this is usually done with a **dialog box**. A dialog box is a rectangular region that pops up on the screen. The box appears over whatever else might be on the screen as if it were a white index card just placed on top of everything on your desk. Typically there is some text in the box requesting the user to make a choice or to enter some data.

For example, later in this chapter the procedure for renaming a disk is described. When you select the **rename** command a **dialog box** appears with the message:

Please enter the new disk name:
(the current disk name appears here)

In the bottom right corner of the box there is an icon with the word **Cancel** in it. In order for the program to proceed, you must either delete the existing disk name (by hitting DEL on the keyboard) and enter a new disk name, or move the cursor over the Cancel icon and press the fire button.

When you have entered the required data or made the appropriate choice in a dialog box, the information is provided to the program and the dialog box disappears.

Applications

There are many types of computer programs on the GEOS disk. Major programs —ones offering a great deal of utility—are called **applications. geoWrite** and **geoPaint** are the two **applications** shipped with the GEOS disk. Berkeley Softworks will be developing additional applications to run under GEOS in the future.

Documents

The **geoWrite** and **geoPaint** applications allow you to create high resolution 8-1/2 x 11 inch pages. The pages created by these applications are stored in data files on the disk. The data files are referred to as documents.

Windows

A framed rectangular region on the screen is usually referred to as a **window**. **Windows** typically are used to separate different functional areas on the screen. A window may be a viewport onto an area larger than can be displayed on the screen.

For example, **geoPaint**·provides a **drawing window** into an 8-1 /2 x 11 inch document. This window shows only part of the document at a time. The document can be **scrolled** or **moved** behind the window to allow you to view different parts of the page.

Drawing
Window
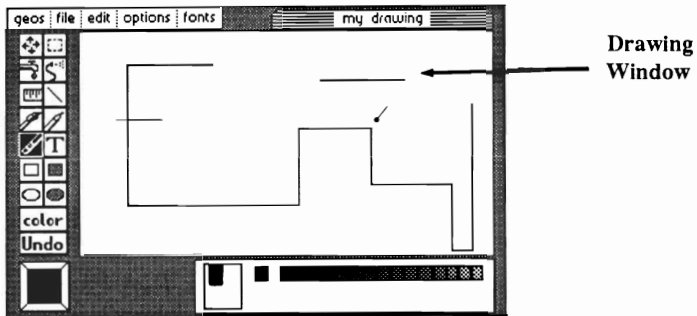
Fonts, Type Styles, Point Sizes, and Proportional Spacing

Fonts are a new way of looking at text. Instead of having one fixed character set — like typewriters — GEOS offers you multiple character sets or fonts. You can type with the medieval characters of the **Dwinelle font** or with the simple straight lines of the **University font**. The word **font** corresponds to the general shape of the characters used to represent the letters and numbers.

A font file on the GEOS disk may contain versions of the character set at different sizes. The size of a character set is measured in **points**. In standard typesetting terms, a **point** is 1/72 of an inch. The actual height of characters printed using GEOS will depend on the resolution of your printer.

For any given character set, that is font and point size, you can also change the **type style** used to print the character set. Available styles are plain, **bold**, *italic*, outline, and underline.

If you look closely at the spacing between the individual letters printed by most typewriters, you will notice that the letters are printed with a fixed spacing. If you now look at a professionally printed page—like this page—you will notice that the spacing depends on the shape of the letter. For example, the letter "w" is wider then the letter "i". This is called **proportionally spaced printing** because each character is proportioned differently. GEOS uses **proportional spacing** for all text to allow you to create professional looking documents.

The original GEOS disk has five different fonts files, each with a number of point sizes. Berkeley Softworks offers a font disk with 20 additional fonts. Once font files are located on a disk, they can be used with any application on that disk.

Desk Accessories

A **desk accessory** is a small utility program used from within a GEOS application. You can quickly pop up a **desk accessory** program, then return to the application. Desk accessories are all located under the **GEOS** menu (the left-most item at the top of the screen.)

For example, while in the **geoWrite** application, you might be typing in a column of numbers. If you want to total the numbers, you can select the **calculator desk accessory** from the **GEOS** menu. The calculator will pop up over the document, and you can use the calculator to sum the figures. When you are finished, simply click the off button of the calculator and the calculator will disappear, returning to the geoWrite application.

Calculator Desk Accessory

Off Button
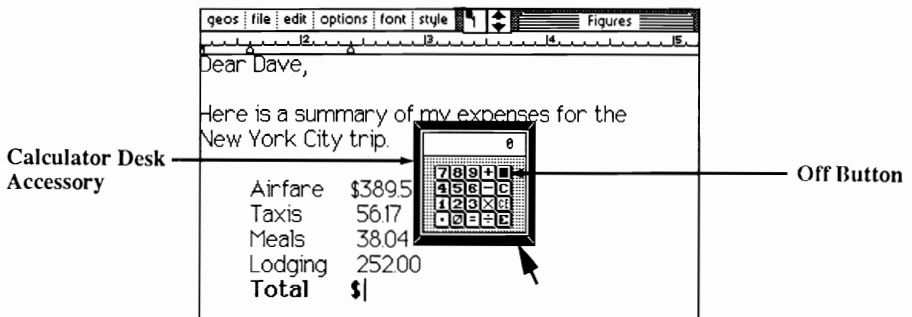
The Pointer and Pointing

After booting GEOS, a colored arrow appears on the screen. This arrow is called the **pointer**. The pointer can be moved around the screen by moving the joystick in different directions. Moving the **pointer** onto an item is called **pointing** at that item.

The Text Cursor

When working with text, there is usually a small flashing bar on the screen indicating where the next typed character will appear. This bar is called a **text cursor** or sometimes just a **cursor**.

Clicking, Selecting, and Activating

Most commands in GEOS are entered by **pointing** at something on the screen and pressing the fire button on the joystick. The action of pressing the fire button is called **clicking**. In the "Making Work Disks" section, you were instructed to use the joystick to move the arrow over the Disk Copy file icon and then press the fire button. Using our new vocabulary we would simply say: **point** at the icon and **click**. The combination of moving the pointer over an item and clicking is sometimes further abbreviated as **clicking on** an item. For example we might say: **click on** the Disk Copy file icon.

When you move the **pointer** over an item and **click,** it is selected for some purpose. This is often referred to in the manual as **selecting** an item. For example, before using the **info** command in the **file** sub-menu, it is necessary to **select** a file. This is done by moving the **pointer** over a file icon and **clicking**.

For some icons **clicking** causes an action to occur. For example, **clicking** on the disk icon on the upper right of the deskTop screen causes the disk in the drive to be opened and its files to be displayed on the **Disk Notepad**. This is often referred to as **activating** an item or **opening** an item.

Double-Clicking

There are many commands in GEOS that can be executed more quickly by using a shortcut we refer to as **double-clicking**. **Double-clicking** is accomplished by pointing at an item (usually an icon) and pressing the fire button on the joystick twice in rapid succession. Since **single-clicks** and **double-clicks** often cause different actions to take place, the quick timing of **double-clicking** is important. With a little practice you will soon learn how to reliably **double-click.**

As an example, a little later in this chapter, we will enter the **geoPaint** application. One way of entering the application is to **select** the **geoPaint** file, **click** on the file menu item, and then **click** on the open menu item that appears in the sub-menu. A faster way of entering the application is to point at the file icon and **double-click.**

Dragging Ghost Icons

GEOS creates a desktop metaphor for your computer. For example, a **geoWrite** document appears as a picture of a stack of papers with the name of the document appearing under the picture.

If you want to get rid of a document in the real world, you might throw it in the waste basket. Similarly in GEOS you can get rid of a document file by picking it up and **dragging** it over to the **waste basket icon** and dropping it in. This is accomplished on the deskTop by **clicking** once on the document file icon, pausing, and then **clicking** again. A **ghost image** of the icon will appear over the file icon in a different color. As you move the pointer, you will notice that this image is attached to the pointer. Wherever you move the pointer, the **ghost icon** will also move.

Selecting Icons (Reverse Video)

Often items change appearance when they are **selected.** The most common method used by GEOS to indicate selection is displaying in **reverse video.** For example, when a file icon on the desk top is **clicked on**, the icon picture changes appearance in the following manner: all portions of the picture previously white become black and vice versa. The effect is very much like a photographic negative. This is referred to in the manual as reverse videoing the icon image. Sometimes we simply say the image **reverses.**

Highlighting Text

In **geoWrite**, text may be cut, or copied, from the document, and pasted elsewhere in the document, or into a text album. In order to indicate to the program the portion of text to be cut, it is necessary for you to **highlight** the text. You do this by moving the pointer to the start of the text to be **highlighted** and pressing the fire button. While holding the fire button down, move the pointer over the text to be **highlighted**. The text will **reverse** as the pointer moves over it. When the end of the text region to be **highlighted** is reached, simply release the fire button. All of the text between the start point and the end point will appear in **reverse video**.

Before Turning the Page...

If this terminology is new to you, you may want to return to this section again. The rest of the manual will be much easier to follow if you clearly understand the terms and techniques described here.

Closing, Opening, and Renaming a Disk

Closing a Disk

After booting GEOS from the **System** disk (see "Booting GEOS," **Chapter 1**), click on the word **disk** in the **command** menu. Click on the word **close** in the sub-menu that pops up. The **Disk Notepad** will be cleared, and the disk icon on the right side of the screen will be replaced by a picture of a disk with a question mark.

The procedure you have just performed is called **closing a disk**.

Opening a Disk

We can re-open the **System** disk by clicking on the picture of a disk with a question mark. Try this now. The screen will display the **Disk Notepad** for the GEOS **System** disk.

The procedure you have just performed is called **opening a disk**.

Now close the disk using the procedure outlined above in "Closing a Disk."
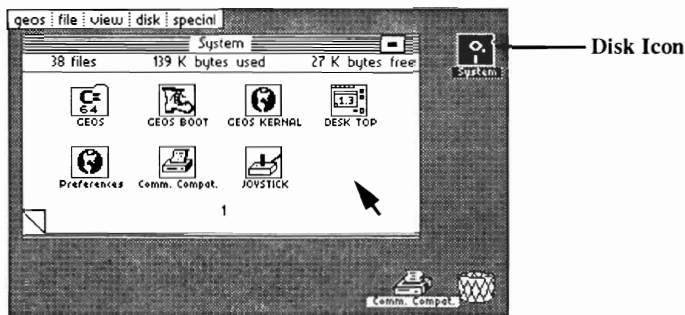
Re-insert the disk marked Work Disk 1 into the disk drive and open it.

Renaming a Disk

To avoid confusion between the **System** disk and a **Work** disk, and to avoid confusion between two work disks, give each work disk a unique name. To rename a disk, click on the word **disk** in the command menu. When the sub-menu pops up, click on the word **rename**. The sub-menu will disappear and a dialog box will appear in the middle of the screen and display the message:

> **Please enter the new disk name:**
> **Work Disk 1**

Notice the current name of the disk is the second line of text in the dialog box. This line is followed by a text cursor. Put down the joystick and press the INST/DEL key on the keyboard. Hold the key down until the cursor erases all of the characters in the current disk name. Now type the new name; for example:

> **Term Paper**

and press the RETURN key. The box will disappear and the Disk Notepad will be redrawn with the word Term Paper appearing at the top of the disk Notepad as the new disk name. (The disk icon in the upper right-hand corner will also have the new disk name appearing underneath it.)

Change the name of the disk back to **Work Disk 1** and continue to the next section.

Tailoring a Work Disk

In order to create more free space on the work disk for your work, you may need to delete some files. What follows is a step-by-step procedure for custom tailoring your GEOS work disks to best serve your needs.

NOTE: Before you start to tailor disks, be sure that you have made at least one additional copy of GEOS applications. (See "Making a Work Disk," **Chapter 1.**)

Changing Individual File Write-Protect Status
Some GEOS files have the write-protect status set to prevent accidental deletion. Since we want to delete some of these files from a work disk, we must first change the write-protect status.

As an example, to create additional room on a work disk meant for text editing, you could delete the file geoPaint from the disk.

To change the write-protect status of the geoPaint file, first, click on the geoPaint file icon. The file will change to reverse video. Now click on the **file** menu item in the command menu. Click on the **info** item in the sub-menu that pops up. As shown in the screen below, an info box will pop up over the desk top screen and display information about the **geoPaint** file. The info box is described in more detail in the **File Info Command** section on page 3-7. For now we are only interested in the write-protect box.

Write Protect Box

Close Icon
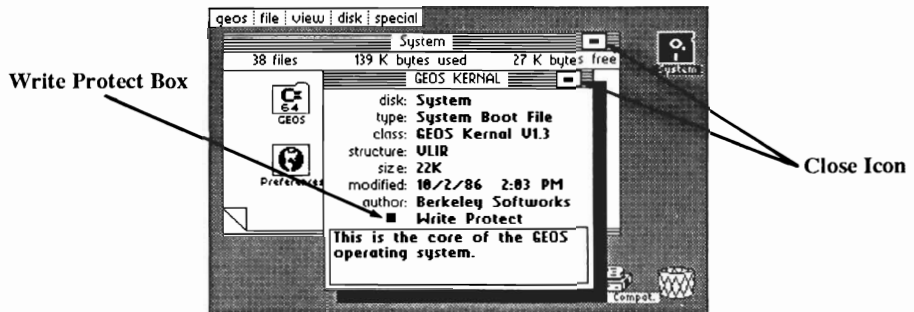
Toward the bottom of the **info** box, there is a small rectangle with the words **Write Protect** next to it. You can tell if the file is write protected:

> If the rectangle is solid black, then the file is write protected and cannot be deleted from the desk top.
> If the rectangle is hollow, then the file is not write-protected.

The **geoPaint** file comes write protected from Berkeley Softworks. To remove the write protection, simply click on the box to the left of the words **Write Protect** in the **info box**. The solid black box will be replaced by a hollow box. If you click on the write-protect box again, the box will return to a solid black box, indicating the file is again write protected. Each time you click on this box it will toggle between write protect being set and cleared.

Be sure the write-protect box is hollow before continuing.

Now click on the **close icon** in the upper right-hand corner of the **info box**. The **close icon** is a square with a dot in the center. After clicking on the **close icon**, the **info box** will disappear and the file will no longer be write protected.

Deleting Files for More Working Room

We are now ready to delete **geoPaint** from the work disk to make more room. Click on the geoPaint icon, pause, and click again. A ghost icon for the file will appear and be attached to the pointer. Drag the icon down to the waste basket and click. The icon will flash for a few moments and then both the ghost icon and the file icon on the Disk Notepad will disappear. The disk information bar at the top of the Disk Notepad will display the additional disk space created by deleting the geoPaint file.

Turning Disk Notepad Pages

A 1541 disk can have as many as 144 different files on it. The original GEOS disk comes with 26 files. You have probably noticed the disk Notepad page has room for eight files. In order to see more of the files on the disk, you must turn the pages. At the bottom left corner of the Disk Notepad, you will notice the page is turned up. Clicking on the **dog-eared corner** will cause the next page of the Disk Notepad to be displayed. In this manner you may page through the 1541 disk directory observing the files on any disk, eight at a time.

If you click on the small corner of the next page that is exposed by the turned up **dog-eared corner**, the preceding page of the Disk Notepad will be displayed. When you reach page 1 and click once more, the Notepad wraps around to the last page. This is a quick way to go to the back page. (You can page backward from there.)

Jumping to a Page

You can jump directly to any page between 1 and 9 simply by typing the page numer. If you type a number larger than the last page number, nothing happens. (If you are using a Commodore 128, you must use the number keys along the top row--the numeric keypad won't work.)

Congratulations . . .

You have just tailored your first work disk. As you learn more about GEOS, you will see how the techniques you have just learned can be used to tailor more specialized work disks. For example, you can create a paint work disk with only **geoPaint** and a few font files. As you become more familiar with the purposes of each file you will learn how to mix and match files to suit your every need. As **Berkeley Softworks** and other developers come out with more applications, fonts, and desk accessories for GEOS, you will be able to expand the capabilities of your system. GEOS really is a whole new world for your Commodore computer.

Using Desk Accessories

Loading Desk Accessories

Desk Accessories are small programs quickly accessible while in an application. When selected, a desk accessory loads into memory and takes control of the system. The main application is suspended and cannot be used again until you put away the desk accessory. When you turn the desk accessory off the application will resume exactly where it was before you started the desk accessory.

To bring up (load) a desk accessory, click on the **geos** menu item in the command menu, then click on the desired desk accessory in the sub-menu that pops up. For example, load the **preference mgr** desk accessory (mgr stands for manager). After selecting the desk accessory, the disk drive will become active and in a few moments the following window will pop up on the screen.
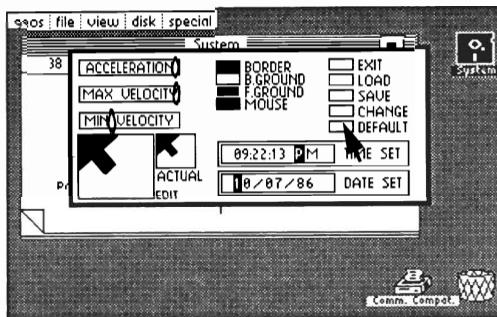
To set the time and date in the preference window, point **TIME SET** in the lower right portion of the window. Hit the space bar on the keyboard to move the cursor over to the first digit of the time. Type the correct time and press RETURN.

Now point at the words **DATE SET** appearing in the box just below the time. Again hit the space bar to move the cursor over the first digit of the date. Type in the current date and press RETURN.

Each time you boot GEOS you should set the time and date. GEOS marks all of your files with the time and date they were last modified. If you faithfully set the time and date each time you boot, you will have a chronological record of when each file was modified.

There are several other system parameters that can be set by the preference mgr. These are covered in detail in a later chapter dedicated to desk accessories. For now we will simply return to the deskTop by clicking on the box in the upper right-hand corner next to the word **EXIT**.

When a Desk Accessory Will Not Load

Sometimes when you click on a desk accessory in the geos menu, the disk will start up for a moment but then stop, and the desk accessory will not have loaded. This will happen if there is not enough free disk space on the current disk. Desk accessories need disk space to save the state of the currently running program—that is, the deskTop or an application—so the program can be restored after the desk accessory has been used.

Another reason a desk accessory would not load is if the disk has been removed from the drive. Also if you close a disk and insert a new one, be sure to open the new disk (clicking on its icon) before trying to load any desk accessories.

Adding and Deleting Desk Accessories

The desk accessories that appear in the geos sub-menu are the desk accessory files that are on the current disk. Each of the desk accessories in the geos sub-menu represents a file on the disk with the same name. The menu is actually constructed by searching the disk for all files of the type **desk accessory**.

If you delete a desk accessory file from the disk, that desk accessory will no longer appear in the geos menu. As an example, turn to the Disk Notepad page containing the **preference mgr** file icon. Click on the icon, pause, click again. Drag the ghost icon over to the waste basket and click again. In a few moments both icons will disappear and the Disk Notepad will be redrawn. Now click on the **geos** menu item. You will notice the **preference mgr** sub-menu item no longer exists.

To summarize, the desk accessories available to you are based on whatever desk accessory files are on the disk you are using. This is another part of the flexibility offered by GEOS. You can further tailor your work disks by picking and choosing the desk accessories you want on the disk. We have just "walked through" deleting a desk accessory. To **add a desk accessory,** you simply copy the desk accessory file you wish to add to your work disk. Copying a file is covered in the next section. Berkeley Softworks will shortly be offering a desk accessory pack containing a number of new desk accessories such as a calendar/reminder and electronic address book.

Copying a File from One Disk to Another

To create the disk marked **Work Disk 1** in **Chapter 1**, you used the **Copy Disk** utility program to copy the entire **Applications** disk. Sometimes it is necessary, or more convenient, to copy just a single file from one disk to another.

For example, you will want to have your printer driver file on your work disk. You can copy the correct driver file from the **System** disk. This section shows how to copy a file from one disk to another using only one disk drive. If you own two drives, copying is much easier (see **Chapter 3**).

Selecting a Disk Icon
An icon on the Disk Notepad can be in any of three selected states: unselected (normal state), selected, and ghost. All icons on the Disk Notepad start out in the unselected state. You click on the icon to change how it is selected:

1. **First click—Selected.** Move to any icon and click once. This selects the icon (it becomes highlighted in reverse video). Now you can do things such as select **info** in the **file** menu.

2. **Second click—Ghost Icon.** After *pausing,* click a second time on the icon. This makes a ghost icon appear. In this state you can move the ghost icon with the joystick (for rearranging icons). (Don't move the ghost icon off the notepad at this time.)

3. **Third click—Unselected.** Click a third time and the icon returns to its original unselected state.

Practice cycling through these three states but **always pause a second or more between clicks.** (Otherwise you will open the file--this is called double clicking - described in **Chapter 3** under "Opening files in deskTop.")

Moving a File to the Border
The first step in copying a file on a one-drive system is to open the **source disk** (containing the file to be copied). Recalling the technique we learned in the **Closing and Opening a disk** section, **close** the work disk and remove it from the drive. Insert the **System** disk and **open** it.

You want to copy a printer driver file onto your work disk, so turn to the Disk Notepad page containing your printer driver (see the list at the end of **Chapter 2**). Click on the icon, pause, and click again. Drag the ghost icon down to the border

area below the disk Notepad and click. The ghost icon will disappear and the printer driver icon will move from the disk Notepad page down to the border. Close the **System** disk. Notice that the printer driver file icon remains on the border after the disk is closed. Remove the **System** disk and insert the disk marked **Work Disk 1.** Open **Work Disk 1.**

Printer
Driver File
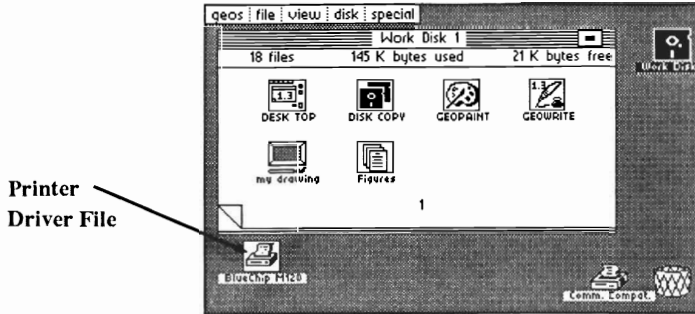
NOTE: Never try to copy a file from one disk to another if the disks have the same name. You should never have two disks with the same name. If you discover you do have two disks with the same name, use the **rename** command in the **disk** sub-menu to rename one of the disks.

Moving a File from the Border onto the Disk Notepad

Click on the printer driver file on the border, pause, and click again. Drag the ghost icon up onto the Disk Notepad page and click. When you attempt to move a border file from another disk onto the Disk Notepad of the current disk, GEOS interprets this as a file copy request.

A dialog box will appear asking you to insert the **System** disk (the disk on which the file resides). Be sure to insert the **System** disk and close the disk door before clicking **OK** in the dialog box. When you have done this, the disk will become active as GEOS reads in as much of the file to be copied as can fit into an internal copy buffer (temporary holding area). Another dialog box will then appear asking you to re-insert the disk marked **Work Disk 1.** If the file is larger than the copy buffer, it may require several disk swaps to completely copy the file on a one-drive system.

When the copy is complete, the **printer driver** file will disappear from the border, and the Disk Notepad will open to the page where the copy exists.

Printer Driver File
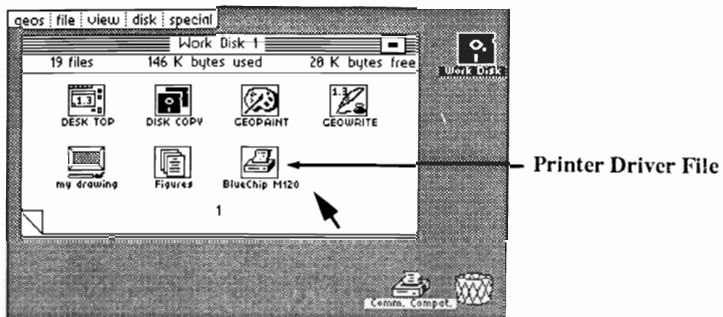
NOTE: Use the same **Copy File** procedure to copy more printer drivers, or other files, onto your work disks.

Opening an Application

Entering geoPaint

To enter an application, simply click once on the icon for the application you want and then select **open** in the **file** sub-menu. For example, turn to the page on the Disk Notepad where the GEOPAINT icon appears. Click once on the icon. The icon image will highlight. Click on **file** in the command menu and then click on **open** in the sub-menu that appears. The disk will become active and in a few moments the **geoPaint** application will appear (see screen below). (NOTE: another way to enter geoPaint is to quickly double-click on its icon.)
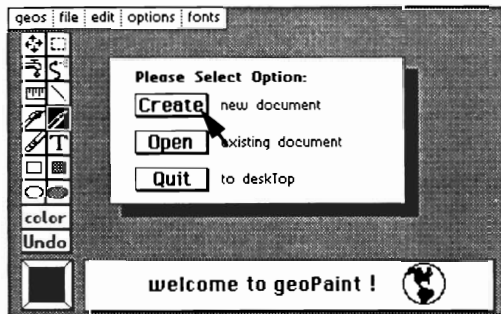
Click on **Create** in the dialog box. Another dialog box will appear requesting you to type in a filename. Type **test** and press RETURN. A large window will appear with the name **test** at the top of the window. This is the window in which your **geoPaint** document is displayed.

If you move the pointer into this window, you will notice the pointer changes shape. **geoPaint** automatically puts you in pencil mode when you create or open a document. Click once and the pencil will change color to indicate it is ready to draw a line. Now as you move the pencil around the screen, you are drawing a line. Click again and the pencil changes back to the original pointer color indicating it is lifted off the page and can no longer draw.

Returning to the DeskTop

An entire chapter is dedicated to the many tools and features of **geoPaint** (**Chapter 4**). Let's return to the desktop by clicking on **file** in the command menu and then clicking on **quit** in the sub-menu that appears. The disk drive will become active and in a few moments the desktop will reappear.

Entering geoWrite

Turn to the Disk Notepad page with the GEOWRITE icon. We will use a *shortcut* to enter **geoWrite**. Move the pointer to the icon and **double click**. As you will recall from the "Let's Get Our Terms Straight" section, **double-clicking** requires pressing the fire button twice in rapid succession.

You will know if you have successfully **double-clicked** if the file begins loading. If GEOWRITE does not come up on your screen, one of two things has happened:

1. If you double-click too fast, sometimes only one of the clicks is recognized and the file simply appears highlighted.

2. If you double-click too slow, a ghost icon for the file will appear and be attached to the pointer.

In both cases, point at the blank space next to the file icon on the Disk Notepad page and click. The file will return to its unselected appearance and you can try again. When you have successfully **double-clicked** on the GEOWRITE file icon, the program will load and the screen shown below will appear.
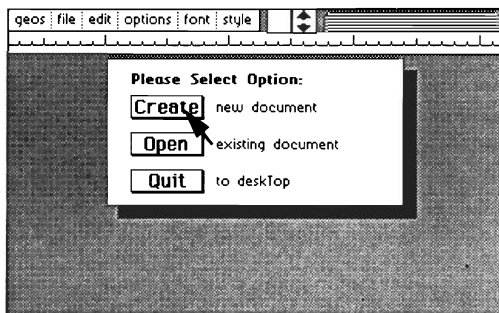
Notice that the dialog box in the center of the screen is identical to the box that appeared when we first entered **geoPaint**. Part of the GEOS philosophy is to maintain as much consistency across applications as possible. Click on the **Create** icon. When the dialog box requesting the filename appears, type: **letter home** (then press RETURN).

The dialog box will disappear and a window will fill the screen below the rules. This is a window into a **geoWrite document**. In the window is a flashing **text cursor**. Before we begin typing, let's select a new font.

Selecting a Font
Click on the word **font** in the command menu. Click on **Roma** in the sub-menu that pops up. Another sub-menu will then pop up listing the **point sizes** avialable. Click on **12 point**. Now type:

> **Dear Mom,**
> **I am writing this letter with geoWrite.**

Fonts are similar to desk accessories in that the fonts available to an application are based on the font files on the disk. You can add and delete font files from the work disk. Whatever fonts appear on the disk will be available in the application. Berkeley Softworks offers a font disk with over 20 additional fonts.

There is an entire chapter dedicated to geoWrite and the features it offers. For now we will simply return to the **deskTop**. As in the geoPaint example, simply click on the **file** menu item, and then click on **quit** in the sub-menu that appears.
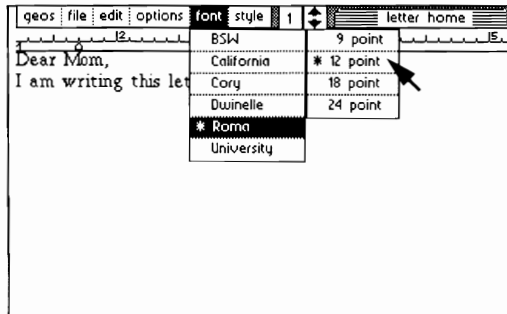
Choosing A Printer Driver & Printer

If you click on the word **geos** at the command menu, one of the items in the sub-menu that appears will be **select printer**. Click on this item. A dialog box will appear displaying a number of files in a window. The files listed in the window are the available **printer drivers** for sending GEOS documents to your printer. These files are called **printer drivers.**

Use the table at the end of this section to match **printer drivers** to printers. If the driver you should be using does not appear in the window, click on the down arrow below the window—the files will scroll to display any additional files. Click on the appropriate printer file—it will highlight to indicate it has been selected.

NOTE: The filename of the currently selected printer will appear underneath the **printer** icon at the bottom of the screen.

There are 25 printer drivers supplied on your **System** disk; they are located on pages 3, 4 and 5 of the deskTop.

Page 3	Page 4	Page 5
1526	IBM 5152+	Oki 120
BlueChip M120	ImageWriter	Scribe
Commodore Compat.	ImageWriter II	Star NM-15
Epson FX-80	MPS-801	Star NL-10 (com)
Epson JX-80	MPS-1000	Star NX-10
Epson MX-80	Okimate 10	Star NX-10C
Gemini 10x	Okimate 20	Star SG-10/15
HP Laserjet	Oki ML-92/93	

NOTE: GEOS selects the first driver found on the Disk Notepad as the 'default' driver. All drivers are found on pages 3, 4 and 5 of the **System** Disk Notepad except for one driver which is on page 1. This driver (Comm. Compat.) is, therefore, selected as the default when you boot GEOS. To set your disk up so your particular printer is the *default,* refer to the instructions "Setting Your Printer as the Default Printer" later in this chapter.

There is a wide variety of printer and printer interface card combinations for the C64. So many, in fact, that we have not had time to test all the different possibilities. We have, however, been able to test quite a few of the popular

printers and interface cards. The table at the end of this section is a synopsis of how we connected or configured different printers and interface cards to make them work with GEOS.

If you don't find your particular printer listed, don't despair—most printers are compatible with one of the printers listed and can use the same setup. If you find some combination not listed that works for you, please let us know so we can help others in the same situation. If you can't get anything to work, please call us for help. We may have tested your printer by then can help get you up and running.

As new printers become available, Berkeley Softworks will write new printer drivers to support these devices. These drivers will be made available to registered GEOS users for the cost of the diskette plus shipping and handling. They will also be available for downloading on Quantum Link.

Selected Printer Driver
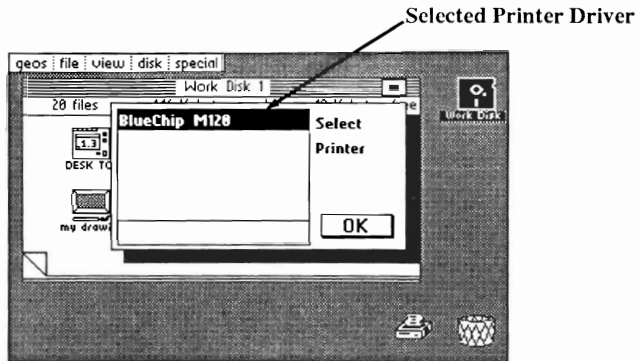
Printing a Document from the Desk Top

After selecting the printer driver for your printer, turn to the Disk Notepad page containing the **letter home** file you created in the previous section. Click on the icon, pause, and click again. Drag the ghost icon over to the printer and click. The disk will become active and in a few moments the file should begin printing. When the printing is complete, the desk top will be redrawn.

Note: Files can also be printed from within applications.

If the printer is not connected, or is incorrectly connected, a dialog box will appear saying: **The printer is inaccessible**. If this happens, check your printer connections and power switch and try again.
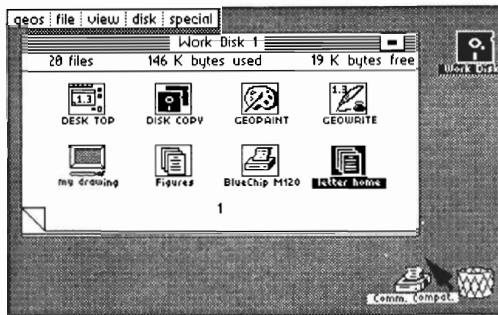
Printing a file from the deskTop

Choosing an Input Driver

Click on **geos** in the command menu on the deskTop. Click on the **select input** item in the sub-menu that pops up. A dialog box will appear with a window displaying all of the input drivers on the current disk. Choose the input device you wish to use by clicking on the appropriate input driver in the dialog box, and then click on the **OK** icon.

As is true with printer drivers, it is possible to change the default input driver set by GEOS when the system boots. You move the input driver ahead of all other input drivers on the Notepad (the same way you set the default *printer* driver).

Berkeley Softworks is developing input drivers for other devices and these will be made available to registered GEOS owners for the cost of the diskette plus shipping and handling. The drivers will also be available by downloading from Quantum Link. Light pen, drawing tablet, and mouse drivers are under development.

The joystick driver will work with some other input devices such as the Commodore 1350 mouse and certain track balls. These devices actually generate joystick directions based on the direction they are moved. Berkeley Softworks is working with Commodore and other mice manufacturers to come up with a mouse that works as a *true* mouse for the C-64. Stayed tuned. . .
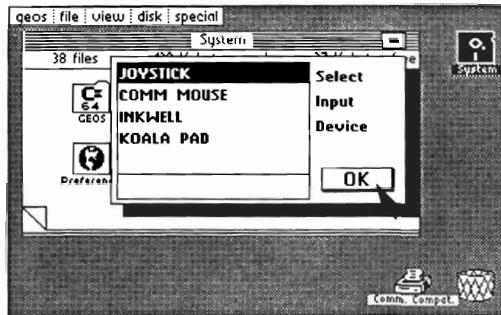
Choosing an Input Driver

Setting Your Printer Driver
as the Default Printer Driver

GEOS supports many different printers. Each one requires its own file called a **printer driver**. (See the table at the end of this section to find the printer driver you should use.) Your printer driver should be the first one on the **System** disk and the only one on your **Work** disk.

What follows is a procedure you do *only once* to the original GEOS System disk. Thereafter, GEOS will boot up ready for your printer.

Whenever you boot up GEOS, it looks for the first printer driver it can find on the **Disk Notepad** (starting at page 1, searching from left to right across the top row, then the bottom row of each page). This printer driver is called the **default** printer driver. GEOS automatically loads this printer driver when it boots up. Thus, to make GEOS boot up ready to use your printer, you must move your printer driver ahead of the others on the original boot disk. To do this, *swap* the first driver with your printer driver.

1. Select **close** from the Disk pull down menu. Then remove **Work Disk 1** from the disk drive.

2. Insert the **System** disk into the disk drive.

3. Select **open** from the **disk** menu (or click on the disk icon with a question mark).

4. Turn through the pages of the Disk Notepad for your particular printer driver. (Do this by clicking on the dog ear in the lower left-hand corner of the Disk Notepad.)

5. When you find your printer driver, click on the icon, pause, and click again to bring up the ghost icon.

6. Drag the ghost icon downward off the Notepad and onto the gray deskTop.

7. Leave the ghost icon of the driver on the deskTop area by clicking once.

8. Page back through the Notepad to the page containing the first printer driver on the disk (usually page 1).

9. When you find the first printer driver, click on its icon, pause, and click again to bring up the ghost icon.

10. Drag the ghost icon downward off of the Notepad and onto the gray deskTop. Deposit it there by clicking once.

11. Move to your printer driver (at the bottom of the screen). Drag its ghost icon to the open spot you just freed up on the Notepad and click once to deposit it there.

12. To finish, drag the ghost icon of the other printer driver (at the bottom of the screen) onto the Notepad and click once. If that page is full, the icon will drop into the first available space on a following page.

13. When done, the **System** disk should be in the drive. Choose **select printer** from the **geos** menu. Your printer driver should now be the first one in the list. Click on **OK** to select it.

14. Select **close** from the disk menu and remove the **System** disk from the disk drive.

15. Insert your work disk and open it. Be sure that the file for your printer driver is on the work disk. (If not, see "**Copying a File From One Disk To Another**," earlier in this chapter.)

16. Select a GEOS application and begin your work. Have fun!

Never and Always (Do's and Don'ts)

Never remove a disk from the drive on the deskTop without first closing the disk (unless specifically instructed to do so by a dialog box).

Never give two disks the same name.

Never try to copy a file from one disk to another if the disks have the same name.

Never use the old C-64 validate command. If you accidentally do use this command, immediately boot GEOS and use the **validate** command in the **disk** sub-menu on the desk top.

Never use the old C-64 scratch command on a GEOS disk.

Never remove the disk from the drive while using an application unless specifically instructed by a dialogue box.

Always create and use work disks—use the **System** disk only for booting.

Always close the drive door after inserting any disk.

Printer Interfaces

Use the table below to set up GEOS to print your documents. Find your printer in the first column, set up the interface card as indicated in the middle column, and then set up the printer driver shown in the right-hand column as the default printer river. (See "**Setting Your Printer as the Default Printer Driver**," earlier in this chapter.)

Your Printer	Interface	Printer Driver
Apple ImageWriter	Use RS-232 interface	ImageWriter
Apple ImageWriter II	Use RS-232 interface	ImageWriter II
Apple Apple2 Scribe	Use RS-232 interface.	Scribe
* Blue Chip M120	Set interface card to Epson	BlueChip M120
* C.Itoh 8510	Set interface card to Prowriter	C.Itoh 8510
Commodore 1525	No interface card.	MPS-801
Commodore 1526	No interface card.	1526
Commodore MPS-801	No interface card	MPS-801
Commodore MPS-802	No interface card	1526
Commodore MPS-803	No interface card.	MPS-1000
Commodore MPS-1000	No interface card.	MPS-1000
* MPS-1000 using parallel port in IBM mode.	Set interface card to Epson	IBM 5152+
Commodore 1525	No interface card.	MPS-801
Commodore 1526	No interface card.	1526
Ergo Hush80CD	No interface card.	MPS-1000
* Epson FX-80/100	Set interface card to Epson	Epson FX-80
* Epson JX-80	Set interface card to Epson	Epson JX-80
* Epson JX-80 (one color)	Set interface card to Epson	Epson FX-80
* Epson RX-80/100	Set interface card to Epson	Epson FX-80
Hewlett Packard Laserjet	Use RS-232 interface.	HP Laserjet
* Mannesmann Talley Spirit	Set interface card to Epson	BlueChip M120
* Okidata Microline 92/93	Set interface card to Oki	Oki ML-92/93
Okidata 120	No interface card.	Oki 120
Okidata Okimate 10	No interface card.	Okimate 10
* Panasonic KX-P1091	Set interface card to Epson	Epson FX-80
Seikosha SP-1000VC	No interface card.	Comm. Compat.
Star Gemini II	No interface card.	Comm. Compat.
* Star Gemini 10X	Set interface card to Epson	Gemini 10X
* Star Micronics NX-10	Set interface card to Epson	Star NX-10
Star Micronics NX-10C	No interface card.	Star NX-10C
Star Micronics SG-10	Set interface card to Epson	Star SG-10/15
* Star NB-15	Set interface card to Epson	Star NB-15
Star NL-10 w/Commodore interface	Set interface card to Epson	Star NL-109 (com)
* Toshiba PA7253	Set interface card to Prowriter	C.Itoh 8510

* **Special note:** If you own, or are planning to purchase one of the printers indicated by an asterisk (*) and do not already own an interface card, we at Berkeley Softworks strongly recommend that you purchase our **geoPrint** cable. It is less expensive and less bullky than an interface card, and it may also increase the speed of your printing process.

Interface Notes:
1. The printer is always addressed as device #4 on the serial bus, so set the interface card or printer to device #4.
2. Defeat any auto line-feed settings on the printer and the interface card.
3. If the interface card that you are using has a **transparent** mode and you cannot get your printer to work with the specific printer setting, you can use the transparent mode instead.
4. Tested cards are: Cardco Card?+G, G-Whiz, Super G, Micrographix MW350, Telesys TurboPrintGT, Xetex Graphic Printer Interface, Super Graphix, Super Graphix Jr.

Congratulations

You have completed GEOS basic training. You have learned the techniques necessary to begin using GEOS. Take some time to review the concepts and terminology introduced in this chapter. Practice the skills you have learned. You will then be ready to proceed to the following chapters to learn the wealth of additional power GEOS brings to your computer.

Chapter 3: The GEOS deskTop
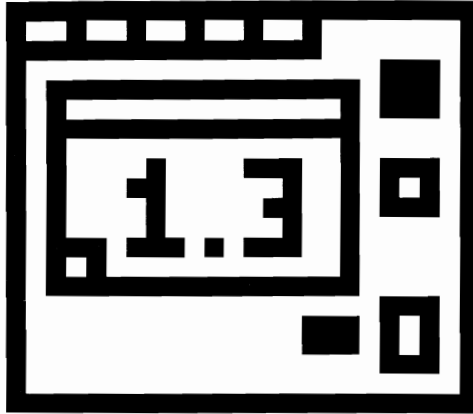
This chapter describes the functions of the GEOS deskTop. It describes how to:

- identify the icons, menus and notepad on the diskTop
- manage *files* (open, rename and copy, move, delete, print and get info)
- manage *disks* (open, close, copy, format, rename and validate)
- create a working disk
- select a joystick, mouse cr light pen
- select a printer
- use Non-Geos disks
- use two disk drives
- use BASIC

At the end is a Quick Reference of all the commands in deskTop menus.

The deskTop Screen

The deskTop is the user interface to the disk operating system. This chapter describes how the deskTop is used to manipulate files and disks.

Command Menu

Title Bar

Disk Info

File Icons

Page Advance

Close Icon

Disk Icon

Disk Notepad

Printer

Trash Can
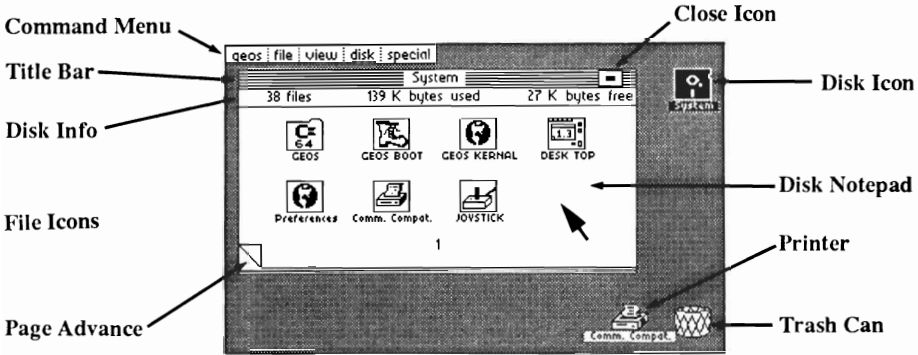
GEOS deskTop

The **Command menu** when selected, lies along the top of the GEOS deskTop. Each item in the command menu will cause a sub-menu of commands to appear .

In the upper-right corner of the deskTop there is a **Disk Icon**, indicating the disk currently in the disk drive. This icon is black when the disk is open.

The **Disk Notepad** is the large white area to the left of the disk icon. It contains information about the currently open disk. The disk's name appears in the Title Bar. The number of files on the disk and the amount of disk space used and available are listed below the Title Bar. The pages of the Disk Notepad display the files residing on the currently open disk.

There may be up to eight **File Icons** on each page of the Disk Notepad. The icon's picture indicates the file's type, such as application or document. The name of the file is written below the icon. To view all of the files on the disk, simply page through the Disk Notepad by clicking the "dog-eared" **Page Advance**. Clicking on the **Close Box**, located in the upper-right corner of the Disk Notepad, closes the disk.

The **Printer** and **Waste Basket** icons appear in the lower-right corner of the deskTop. The Printer icon allows you to easily print a data file: simply drag the file's ghost icon to the Printer icon and click. The waste basket works similarly; to delete a file, simply drag the file's ghost icon to the waste basket and click.

GEOS deskTop 3-2

File Management

There are several categories of GEOS files. These categories depend upon the type of information the file contains and how that information is used.

GEOS File Categories

System Files
- The GEOS operating system files Boot and Kernal
- System data files such as the Photo Scap and Text Scrap.

NOTE: GEOS will not let you rename system files.

Program Files
- Applications programs such as geoWrite and geoPaint.
- Desk Accessories, including the calculator, alarm clock, notepad, preference manager, photo manager and text manager.
- User programs in either Assembly Language or BASIC format.

Data Files
- Documents created by GEOS applications.
- Font files containing bit-mapped image data for text.
- Data files created by non-GEOS programs.

Interface Drivers
- Input drivers to accommodate a joystick, mouse, light pen, Koala pad and drawing tablet.
- Printer drivers, each for a specific printer.

Non-GEOS Files
- Programs and data files which have not been converted to GEOS format. The deskTop displays a "C-64" icon for each of these files.

Opening Files On the deskTop

There are two methods of opening a file from the deskTop. One is to click on the file and then select **open** from the **file** menu. The other is to simply double click on the file icon. The types of files (listed on the previous page) that can be opened from the deskTop are: **BASIC programs, assembly languages programs, application programs, application data** (documents), and **desk accessories.** If you attempt to open another file type, a dialogue box will inform you the file cannot be opened from the deskTop.
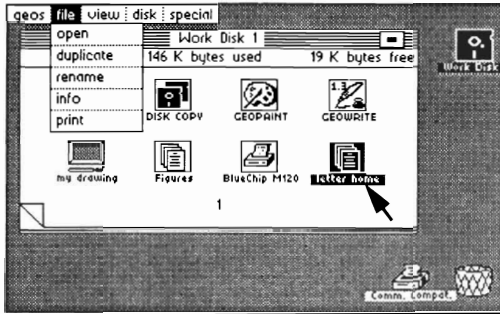
Opening a Document

Renaming a File

To change a file's name, select the file by clicking it once on the Disk Notepad. Then choose the **rename** option from the **file** command menu. A dialogue box will pop-up asking you for the new name.

Making a Copy of a File to the same disk

To create a duplicate copy of a file on the disk, select the icon for that file on the Disk Notepad by clicking it once. Choose **duplicate** from the **file** menu. Enter the name for the new duplicate file in the dialogue box that appears. GEOS will create a copy of the file with the name you enter.

Copying a File to Another Disk

The deskTop makes it easy for you to copy files from one disk to another. For example, you may want to copy a photo scrap created on a work disk containing **geoPaint** to another work disk containing **geoWrite**. When copying between disks, the disk containing the original file is called the **source** disk. The disk receiving the copy is called the **destination disk.**

The procedure for copying a file from one disk to another is different if you own one or two disk drives. If you are using two drives, see Using Two Disk Drives later on this chapter for instructions. If you are using one disk drive, follow these instructions:

1. Insert the source disk and select **open** from the **disk** menu.
2. Move the file icon to the area below the Disk Notepad.
3. Close the source disk and remove it from the disk drive.
4. Insert the destination disk and select **open** from the **disk** menu.
5. Drag the file's ghost icon upward from the deskTop onto the Disk Notepad and click.

Dialogue boxes will prompt you to swap disks as needed while copying the file from the source disk to the destination disk. When the copy is complete, the file icon will disappear from the border and reappear on the Disk Notepad page.

NOTE: Copying a file does **not** delete the file from the source disk. If you re-open the source disk, the file will re-appear on the border.

Moving Files Around on the Disk Notepad
By carefully organizing your files on the Disk Notepad, you will make them more accessible. Here are some techniques to help you:

Moving a File To Another Disk Notepad Page
There are two methods to pull up another page of the Disk Notepad. The first is to click on the dog-eared Page Advance in the lower-left corner of the Disk Notepad. Or, to quickly move through the first nine pages, enter the page number (1 through 9) on the keyboard. You do not need to press RETURN.

NOTE: For pages 10 or greater, you will need to use the "dog ear".

Rearranging Files On the Disk Notepad Page
The Disk Notepad can display up to eight file icons, in the eight positions shown. To swap the positions of any two file icons, move both icons off the Disk Notepad then move the file you wish to appear ahead of the other back onto the Disk Notepad page. When you drop an icon onto the Disk Notepad, it falls into place at the first available open spot on the notepad. If the current page is full, it will drop into place at the first open spot on a following page. GEOS orders the files on the Disk Notepad from left to right, top to bottom.

Moving Files Between Disk Notepad Pages

To move a file icon to another page of the Disk Notepad, drag the file·icon downward off the Notepad and drop it onto the border of the deskTop. Pull up another page of the Notepad and drag the file icon from the deskTop border to the Notepad. Position it on the Notepad, click once and let go of it. The file will appear in the first open file slot.
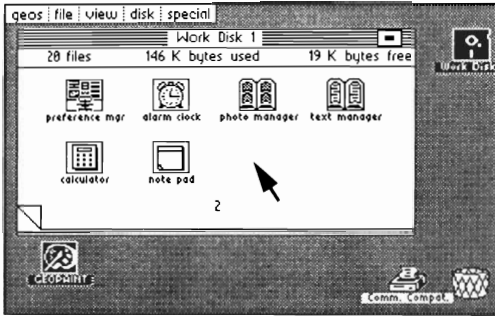
Dragging a file icon back onto the Disk Notepad

Deleting a File

To delete a file from the disk, drag the ghost of its icon to the Waste Basket icon and click once to drop it. The original file icon will disappear from the Disk Notepad and the file will be deleted. One note of caution about the Waste Basket: it is actually an *incinerator*–any files dropped into it cannot be recovered.

If while trying to delete a file, a dialog box appears saying: "This file is write protected and cannot be deleted", you must use the **info** command in the **file** menu to change the file's write protect status. This is covered in the **File Info Command** section of this chapter.

Printing a Document

There are two ways to print a document from the deskTop. You can select the document icon and then choose **print** from the **file** menu. Or, you can drag the document's ghost icon to the Printer icon, and click to begin printing.

NOTE: Only application data files can be printed from the deskTop—that is, geoWrite and geoPaint documents.

The File Info Command

Select **info** from the **file** menu to view a list of information about the currently selected file. This information includes:

disk	name of disk where file is located
type	type of file (system, application, etc.)
class	permanent internal name of file
structure	file structure (sequential or VLIR)
size	size of file, in units of "K" (1024) bytes
modified	date and time file was last modified
author	name of programmer (certain files)
write protect	write-protect status for file

To change the write protect status, click the button next to "write protect". A hollow button indicates the file is not write protected, whereas a solid button indicates the file is write protected.

If the file is on the currently opened disk, and there is a copy of the deskTop on the disk, the area below the file information contains user notes about the file. To add a note to this box, click once in the box to position the Text Cursor. Type in a sentence or two. Useing the DEL key to correct mistakes. Your notes will be saved with the file. To exit the file info box, click on the Close Button at the top of the information window.

Viewing Disk Files by Name, Date, Size, or Type

The **view** menu allows you to change the way the files are displayed on the Disk Notepad. The Choices are:

icon	display in icon form.
name	display alphabetically by name.
date	display most recently modified files first.
size	display by size, largest file first.
type	display by file type.

The **name, date, size, and type** view modes sort the files according to the information category selected. For example, **view by name** sorts the files alphabetically. In these four modes, the files are displayed in text only with one file per text line. To view the other files, click on the up/down scroll arrows appearing at the bottom of the screen.

NOTE: You can select or move file icons only when the Disk Notepad is in "view by icon" mode.

Disk Management and Organization

The GEOS **disk** menu contains several commands to help manage and organize your disks.

Opening a Disk
Choosing **open** in the **disk** menu opens the disk in the drive. The Disk Notepad will display the contents of the disk. After closing a disk and removing it from the disk drive, you can open another by inserting it and again selecting **open** in the **disk** menu. You can also open the disk by clicking once on the disk icon to the right of the Disk Notepad.

NOTE: While a disk is opened, do not remove it from the disk drive.

Closing a Disk
Before removing a disk from the disk drive, select **close** from the **disk** menu. You can also close a disk by clicking the Close Button in the top right corner of the Disk Notepad. The Disk Notepad will be cleared, and the disk's icon will be replaced by an image of a disk with a question mark inside.

Copying a Disk
The **copy** command in the **disk** menu copies the entire contents of one disk onto another. The **disk copy** command is intended for two-drive systems. The disk copy command will work on a one drive system, prompting you to swap disks as needed, but may take up to 25 disk swaps to copy a full disk! A better solution for owners of one drive systems would be to use the Disk Copy utility program — which takes only three disk swaps — and use the disk **rename** command to change the name of the copied disk .

Formatting a Disk
Before a blank disk can be used to store files it must be formatted. To format a disk, first **close** and remove the disk which is currently in the disk drive. Insert the disk you want to format and select **format** in the **disk** menu. A dialogue box will pop up to verify that you want to format the disk.

NOTE: Formatting a disk will destroy all files on the disk.

Renaming a Disk
To change a disk's name, select **rename** from the **disk** menu. A dialog box will allow you to enter a new name. You must enter at least one character as the new disk name.

GEOS deskTop

Validating a Disk

Should you ever encounter problems with a disk, use the **validate** command in the **disk** menu to check the integrity of the sectors on the disk. Validate will not change the contents of the disk. The disk will be reopened after it is validated.

NOTE: Do not use the original C-64 DOS **validate** command on a GEOS disk. This will cause GEOS-specific information to be lost. Should this happen accidentally, immediately re-boot the GEOS disk and do a GEOS **validate** to restore the disk integrity.

Creating Work Disks

As you work with GEOS, you will find it convenient to create several "work disks." This will allow you to organize your work onto several disks and will ensure free disk space for larger documents. You can organize these disks by projects, such as Correspondence or School Work, or by document type, such as Pictures or Essays. Here is a list of the files you might want to include on a particular work disk:

deskTop	(optional, but recommended)
applications	(one or more)
documents	(one or more)
fonts	("BSW" automatically included; others optional)
photo/text scrap	(optional)
desk accessories	(optional)
input drivers	(one for each input device in use)
printer drivers	(one for each printer in use)

Although the deskTop is not required on a work disk, it will be especially useful on disks containing two or more applications. If you do not place a copy of the deskTop on your work disk, you will have to insert a disk with the deskTop on it each time you exit an application.

There are two approaches to creating a work disk depending on how many of the original GEOS files you plan on copying to the work disk. One approach, outlined in the **Before You Begin** chapter, copies the entire applications disk. Another approach is to simply copy the individual files you wish to have on the work disk. The choice is yours. If you own one drive and want to copy all of the files, the first method is easier. However, if you have a two-drive system and want to create a work disk with only a few files (e.g., geoWrite and a few fonts) it might be easier to copy these files individually to the work disk because of the ease with which files are copied on a two-drive system.

To begin work, boot GEOS *using the original system disk*. Close this disk. Insert your work disk and select **open** from the **disk** menu. Select an application or document on the Disk Notepad.

Selecting an Input Device

When booting, the first input driver on the original GEOS disk is read by the operating system. You may then choose an alternate input driver using the **select input** command in the **geos** menu on the deskTop.

Selecting an Alternate Input Device

If you want to select an alternate input driver, click on **select input** in the **geos** menu after booting GEOS. If you are using an input device other than a joystick, see the note below. A dialog box will display a list of the input drivers it finds on the disk. If the list contains more than five names, click on the scroll arrows to scroll the others into view. Select one, and click on the **OK** button.

If this input driver is to be your primary device, move its file into the default position on your system disk (as you did for your printer driver file in **Chapter 2**). Now GEOS will always boot with your input device ready to use.
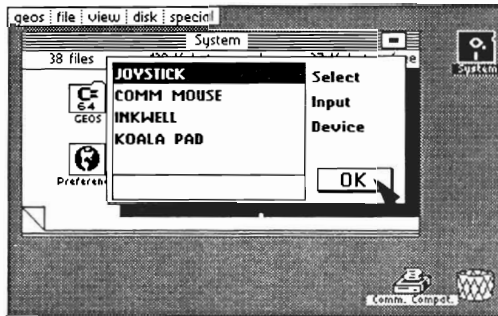
Choosing an Input Drive

NOTE: You can use the keyboard if your input device is not working when you boot up. For instance, if your input device is not set up as the default when you boot up GEOS, you can select the proper driver. Use the following keyboard shortcuts to move the cursor around the screen, or to open and close the disk.

To open the disk: `<Commodore Key> C=` and O
To close the disk: `C=` and C
To put up the Select Input Driver dialog box: `C=` and I

(This allows you to use the keyboard cursor keys to move the cursor. Press RETURN to select a driver).

Selecting a Printer

When booting, GEOS selects the first printer driver it finds on the Disk Notepad as the default printer driver. To change the default printer driver, move the driver you wish to use into the first printer driver position on the Disk Notepad of the **original** System disk. This procedure is discribed in **Chapter 2** "Setting Your Printer Driver as the Default Printer Driver."

Selecting an Alternate Printer

If, after booting GEOS, you want to select an alternate printer driver, click on **select printer** in the **geos** menu. A dialog box will display a list of the printer drivers it finds on the disk. If the list contains more than five names, click on the scroll arrows to scroll the others into view. Select one, and then click on **OK.**
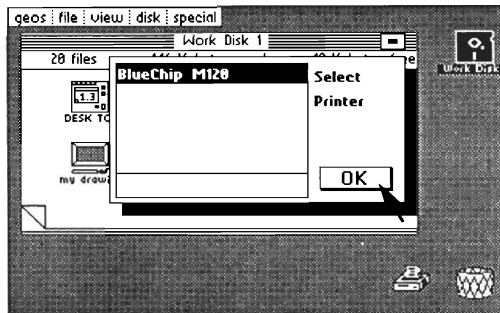
Selecting a Printer

As in the case of input drivers, Berkeley Softworks will be developing printer drivers for all popular printers. If your printer is not listed in the table in the printer section of the **GEOS Training Camp** chapter, call our customer service number. New printer drivers will be made available for the cost of the diskette plus shipping and handling; they will also be available over Q-Link.

Using Non-GEOS Disks

Although programs not specifically designed for the GEOS operating system cannot take advantage of GEOS's windows, icons, and pull-down menus, you can use the deskTop to examine the contents of a non-GEOS disk and to run programs from non-GEOS disks.

Using the deskTop with Non-GEOS Disks

Insert the non-GEOS disk into the disk drive and select **open** from the **disk** menu. A dialog box appears, asking if you would like to convert the disk's directory to GEOS format. If you select "Yes", GEOS will expand the directory on the disk by one block. This additional directory area will be used to keep track of files which are moved from the Disk Notepad to the deskTop border.

If you select "No", GEOS will not allow you to move files from this disk off the Disk Notepad onto the deskTop border. You can however proceed to use the deskTop to manipulate the files on the disk.

Once GEOS has opened the disk, an icon will appear on the Disk Notepad for each file on the disk. Since these files do not have icon images, a "C-64" icon will be displayed for each. You can rename, copy, and delete these files as if they were standard GEOS files.

Running a Program on a Non-GEOS Disk

Once you have opened a Non-GEOS disk and its contents are visible on the Disk Notepad, you can double-click on any of the program file icons to run a program. GEOS will determine the type of program, and will attempt to load and run it. If the disk you have inserted is normally run using the LOAD "*",8,1 command, double-click on the upper-left corner icon on page one of the Disk Notepad.
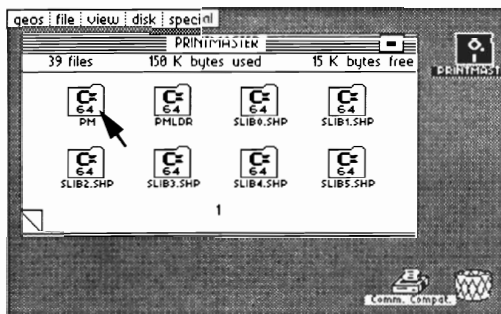
Running a Program on a Non-GEOS Disk

Using Two Disk Drives

Enabling Your Second Disk Drive

If you have changed the jumper in your second drive to permanently change it to device 9, GEOS will automatically enable the second drive when booting. If your drives have not been altered in this manner, **you must start GEOS with the GEOS disk in one drive and the other drive powered off.** (This is because both drives power up as device 8). Then follow the "add drive" procedure as follows:

If you have two disk drives connected but only one appears on the deskTop, you can add the second drive using this procedure. Connect both drives to the serial bus, but only turn on one drive (either one). Boot GEOS and choose **add drive** from the **disk** menu. Follow the directions in the dialog boxes to add the second drive. The drive that was originally powered up will remain device 8 and be referred to as DRIVE A, the drive added will be changed in software to device 9 and is referred to as DRIVE B.

When you have successfully added the second drive, its icon will appear at the right edge of the deskTop (see below). The disk icon for the currently active drive is highlighted (displayed in reverse video).

Selecting the Active Drive
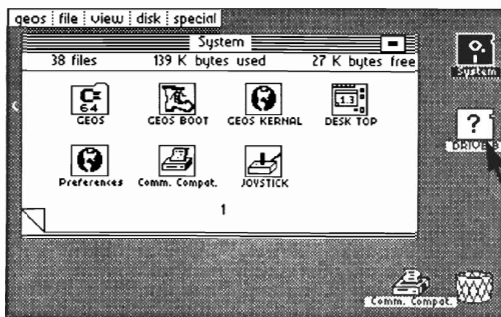
GEOS deskTop with Pointer over Drive B Icon

GEOS deskTop

The Disk Notepad displays the contents of one drive at a time. Furthermore, the disk menu commands act on the currently selected drive. To select the active drive, simply click on that drive's disk icon located at the right. Remember: **Drive A (device 8) is the original drive and appears above Drive B (device 9) on the deskTop.**

Copying Files Using Two Drives

To copy a file from one disk to the other in a two-drive system, simply drag the file's ghost icon over to the disk icon of the other drive and click. GEOS will automatically copy the file.

NOTE: Never attempt a copy operation between two disks with the same name. You should never have two disks with the same name. If you do, use the **rename** command in the **disk** menu to rename one of the disks.

Copying Disks Using Two Drives

Disk copying is also much easier in a two-drive system under GEOS. Simply select **copy** from the **disk** menu. Your disk will be copied quickly and without disk swapping.

The RAM Expansion Unit (REU)

Perhaps the greatest single performance improvement that you can make to your Commodore (now that you have purchased GEOS) is purchasing the Commodore RAM Expansion Unit (REU). This device adds 256K of RAM. Another 256K may be added to yield 512K additional RAM storage.

Enabling The RAM Expansion Unit

The REU comes bundled with a special version of the GEOS KERNEL and a special **deskTop** designed to take advantage of the additional RAM. Follow the instructions for installing the REU KERNEL that comes with the disk in the REU package.

Using the RAM Expansion Unit

The REU GEOS KERNEL implements a disk drive and RAM, and uses the DMA capabilities of the REU to speed memory recall. In essence, the REU KERNEL in combination with the unit itself creates a two-drive system. This gives you all the benefits of a second drive as outlined in **Using Two Disk Drives**, and much more performance, since the second drive is actually in RAM. This gives you virtually instant access. By copying applications and data files to the REU "drive," and running the applications on that drive, you will notice a ten to one hundred times performance improvement in the speed with which applications load and run. When you have completed a document, be sure to copy the files back onto the disk in the actual 1541 drive so you have a permanent copy. Once you turn off the computer, any files stored on the REU drive will be lost.

One of the best ways to utilize the REU is to create a work disk containing the application you wish to use, any desk accessories, and a copy of the **REU deskTop**. Use the **disk copy** command to copy this entire work disk into the REU RAM disk. Open the RAM disk, and work on the documents contained there. When you finish a document, copy it back over to the data disk.

Copying Files Using the RAM Expansion Unit

Copying files from one disk to another is also much faster when using the REU. Place the source disk in drive A (the 1541 drive) and copy the files to the RAM disk. This can be accomplished by dragging the ghost icon for the file over to the RAM disk icon and dropping it. The copy operation will occur very quickly because writing to the RAM disk is almost instantaneous. Now close the source disk in drive A. Insert the destination disk, open it, open the RAM disk, and copy the file from the RAM disk to the destination disk. You will notice that file **copy** can now be performed in a fraction of the time previously required.

The same benefit applies to copying an entire disk. Using the REU you can make backup disks much faster by using the **copy** command from the disk sub-menu. First copy the source disk to the RAM disk. Close the source disk and place the destination disk in drive A. Open the RAM disk and again invoke the **copy** command from the **disk** sub-menu.

Using Desk Accessories with the REU

By placing any desk accessories you wish on the RAM disk you will notice a dramatic improvement in their performance. When you invoke a desk accessory on a RAM disk, it will almost instantly pop up on the screen. Similarly, when you exit the desk accessory, you will almost instantly return to the deskTop currently running applications.

GEOS and BASIC (for BASIC programmers only)

Entering The BASIC Interpreter from the deskTop
The **BASIC** command in the **special** menu will take you out of the GEOS deskTop environment and place you into the Commodore BASIC interpreter. The machine is then running much as if it had just been powered up with one exception: the default NMI vector has been replaced with a vector to some re-boot code for the deskTop in the $C000 memory space. This allows the deskTop to be re-booted by inserting the original GEOS disk into the drive and pressing the RESTORE key on the keyboard (RESTORE generates an NMI).

Returning to the deskTop
If the programs you have run while in the BASIC interpreter do not disturb the memory space between $C000 and $C100 (hex address values), and the NMI vector is not changed, then the deskTop can be re-booted by placing the original GEOS disk in the drive and pressing RESTORE.

Running BASIC Programs from the deskTop
Any BASIC program can be loaded and run from the deskTop. Simply double-click on the program's icon on the Disk Notepad page. If the program is smaller than 26K, the GEOS diskTurbo software will fast load the program into memory and automatically execute a RUN command. If the file is larger than 26K, it will be loaded by the normal Commodore DOS routines and a RUN will be executed.

The Future of GEOS and BASIC
Berkeley Softworks is working on a GEOS programmer's reference manual, which will be published in the near future. Most of the powerful routines in GEOS are accessible through a jump table. The reference manual will allow experienced BASIC and assembly language programmers to access all of the graphics and operating system features of GEOS to develop their own GEOS applications. Another project being researched is an enhanced BASIC interpreter to take advantage of GEOS capabilities.

Quick Reference: deskTop Menus

geos

    geos info: displays copyright notice and version number of GEOS.

    deskTop info: displays version number of deskTop.

    select printer: lets you select a printer driver.

    select input: lets you select an input driver.

    preference mgr: a desk accessory— See Chapter 5 for more details.

    alarm clock: a desk accessory

    photo manager: a desk accessory

    text manager: a desk accessory

    calculator: a desk accessory

    notepad: a desk accessory

file

    open: loads and executes the currently selected file on the deskTop.

    duplicate: creates a duplicate copy of the selected file.

    rename: allows you to rename the selected file.

    info: displays information about the selected file.

    print: prints the selected file (application documents only).

view

    icon: files on disks are displayed on Disk Notepad pages in icon form. You must be in this Icon-View Mode to manipulate the files. The other viewing modes listed below can only be used to display the contents of the disk.

    size: displays files sorted by size, largest file first.

    type: displays files grouped by type.

    date: displays files in order of last modification. The most recently updated file is listed first.

    name: displays files sorted alphabetically.

disk

    open: opens disk currently inserted in disk drive, and displays files on Disk Notepad.

    close: closes currently open disk.

    rename: renames currently opened disk.

    copy: full disk copy. Copies source disk to destination disk, replacing contents of destination disk.

    add drive: enables second disk drive.

    validate: verifies integrity of currently opened disk.

    format: initializes new disk.

special

BASIC: escapes from GEOS deskTop to Commodore BASIC. To reload
deskTop, original GEOS disk must be in Drive A, then hit the RESTORE
key.

RESET: initializes the deskTop and reopens the disk. Use this command after
disk errors, or if you accidently swap disks without following the proper
open and close procedures.

QLINK: boots the QuantumLink disk.

Chapter 4: geoPaint
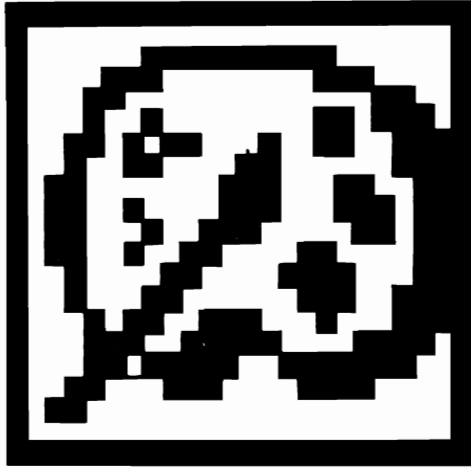
This section covers geoPaint, a powerful color graphics editor. geoPaint allows you to create high-resolution, color graphic images on the display screen and print them. This chapter explains how to:

- enter geoPaint
- draw images
- add text to the images you have drawn
- correct and add details to the images
- issue special geoPaint commands
- print out the images you have drawn
- exit from geoPaint

The geoPaint Screen

Command Menu

Document Name

Drawing Icons

Drawing Window

Current
Pattern Indicator

Pointer

Status Box

The maximum "printed" resolution of a document is 80 dots per inch, or 640 dots wide by 800 dots long (8 x 10 inches). Since this resolution is greater than what can be shown on your screen, geoPaint supports the use of a **Drawing Window.**

Like other "windows" in GEOS, the Drawing Window displays only a portion of a much larger document. In most cases (the "Normal Edit" mode), the Drawing Window allows you to work with an area 3.3 inches wide by 1.8 inches high (approximately 1/14 of the total document). In t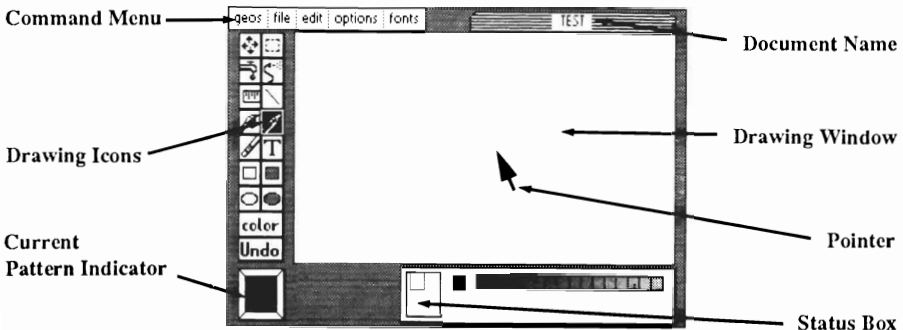he "Pixel Edit" mode (described later in this chapter) the Drawing Window actually magnifies a smaller section of your document into much greater detail. In either case, you can move the document around to work on or view other portions of it.

Above the large drawing window is a **Command Menu.** Clicking on one of the menu names displays a menu with several commands to choose from. Simply click on the command you desire.

Along the left side of the geoPaint screen is the **Graphic Tool Box.** The icons located in the Graphic Tool Box give you access to the many drawing tools described later in this chapter.

The **Status Box,** a rectangular box at the bottom of the screen, displays different information depending on the tool in use.

In most cases, the Status Box appears as shown. Inside it, from left to right, are the **Page Map**, **Card Paint Color Indicator**, and the **Paint Color Bar**. The Page Map displays the size and relative position of the Drawing Window on your document. The Card Paint Color Indicator displays the color that is beneath the Pointer as it moves across the document. The Paint Color Bar displays the sixteen available colors to paint with. The arrow immediately above the Paint Color Bar points to the **Current Color**. geoPaint uses this color whenever you use a drawing tool.

The Status Box displays measurement information when using the Ruler, Line or Rectangle drawing tools. It can also alternately display a choice of available brush shapes and patterns.

Directly to the left of the Status Box is the **Current Pattern Indicator**. Several tools use the pattern displayed in this box—the Paint Brush, Faucet, Air Brush, and Filled Rectangles & Circles.

If you have not already done so, read **Chapter 2**, "GEOS Training Camp" before you continue.

The **Pointer** is used to select menus, drawing tools or patterns. When in the Drawing Window, the Pointer changes shape and color to indicate the particular tool you are using.

geoPaint

Entering geoPaint

There are two ways to enter geoPaint from the deskTop:

*   click on the geoPaint icon on the Disk Notepad, and then select **open** from the **file** menu
*   double-click on the geoPaint icon

In both cases, geoPaint will load and display a dialog box with three options: Create document, Open document, and Quit.
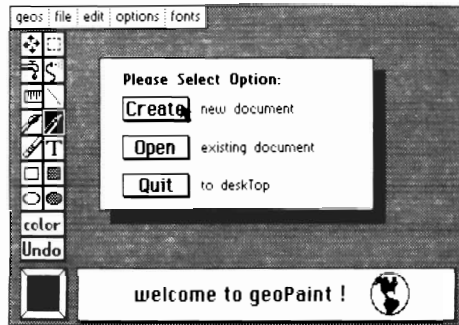
geoPaint Create/Open/Quit Dialog Box

Create New Document

Select **create** to create a new geoPaint document. A second dialog box appears displaying the name of the currently opened disk. Enter a name for your new document and press RETURN.

If you have installed two disk drives, and would rather create the document on the disk in the other disk drive, click on the **disk** icon once. This will activate the other disk. Enter a name for your new document and press RETURN.

Open Existing Document

Select **Open** to open a document that already exists on the disk. A second dialog box appears, displaying the name of the currently opened disk and a list of the first five geoPaint documents on the disk. If there are more than five documents on the disk, click on the lower scroll arrow at the bottom of the box. Each time you click on this scroll arrow, another document name will scroll into view. Highlight the document you desire by clicking on its name once, then click on the **Open** button to open that document.

If you have installed two disk drives, and would rather open a document on the disk in the other disk drive, click on the **Disk** button once. This will activate the other disk. Highlight the document name, and click the **Open** button to open that document.

NOTE: Only 15 documents can be displayed in the **Open** dialog box window. To display more documents, you will need to to move, delete, or rearrange the file icons on the deskTop (see "File Management" and "Disk Management and Organization" in **Chapter 3**).

Quit to deskTop
Select this option to exit geoPaint and return to the deskTop.

Opening an Existing Document From the deskTop
Once you have created a document, saved it and quit geoPaint, you can open it from the deskTop by selecting its icon, and clicking on **open** from the **file menu**. Or you can double-click on the document icon. Either procedure will automatically load geoPaint and then open your document

Running geoPaint with the RAM Expansion Unit (REU)
If you own the Commodore RAM Expansion Unit and have installed the REU GEOS KERNEL, you should always run geoPaint on the RAM disk. We recommend creating a geoPaint disk containing the REU deskTop, geoPaint, the Photo Manager desk accessory, and any other desk accessories that you desire. Use the **copy** command in the **disk** menu to copy the work disk onto the RAM disk. Create and edit your document on the RAM disk. Be sure to copy your document to the 1541 disk drive before turning the system off. For more information on the RAM Expansion Unit, read the section on the REU in the **deskTop** chapter.

Selecting Colors

geoPaint provides 16 "paint" (foreground) colors and 16 "canvas" (background) colors. You draw the images with the paint colors onto the canvas color. You can then choose to go back and change the colors (using Color Wipe).

While drawing with geoPaint, consider that you are painting onto a canvas, and that both the paint and canvas colors can be chosen from a set of 16 colors. Thus, there are two methods of drawing a picture:

1. **Drawing Tools to Create an Image.** You can select any tool and draw the image with any color you choose—the background (canvas) color will not be affected.
2. **Using "Color" to Wipe on New Colors.** Once you've drawn a picture, you can wipe on new colors by selecting "Color" in the Tool Box. This lets you change the canvas color.

These methods are described in more detail below, but before you decide on an approach, you must understand the way in which colors interact and are controlled by the C-64.

The Gridwork of Cards
The C-64 divides a color picture into small squares called "cards". Each card is 8 pixels (dots) wide and 8 pixels high. (The pixels are visible in **pixel edit**.) You can specify a maximum of two colors for each card: one paint (foreground) color, and one canvas (background) color. These cards are not immediately apparent. When you create a new document the canvas color (for all cards) is light gray; the paint color is set to dark gray. When you draw a line on the screen, there are both dark gray and light gray pixels on the same card.

A problem arises however when you attempt to draw a third color on this card. Since the card can show only *two* colors (not three), something has to give—the old foreground color switches to the new color. The result is a "jagged" color change at the boundary of the card. This problem can be avoided with careful placement of your images and the proper selection of paint and canvas colors.

Using the Drawing Tools to Create an Image
Whenever you paint using one of the drawing tools, geoPaint will use the Current Paint Color you have selected. The color of the canvas (background) will not be changed as you draw. To choose a new Current Paint Color, point to the desired color in the Paint Color Bar and click. The Current Paint Color Indicator will move to that color.

By clicking on the Card Color Indicator, to the left of the Color Bar, geoPaint will set the Current Color to whatever paint color is selected for a given region of the Drawing Window. In other words, as you move across the Drawing Window, the Current Color will change to match the color in that region.

Using "Color" to Wipe on New Color

You can change the colors of an existing drawing with the following procedure. Select the **Color** icon from the Tool Box. Once selected, a second color bar for the *canvas* color will appear below the Paint Color Bar:

geoPaint Paint and Canvas Color Bars
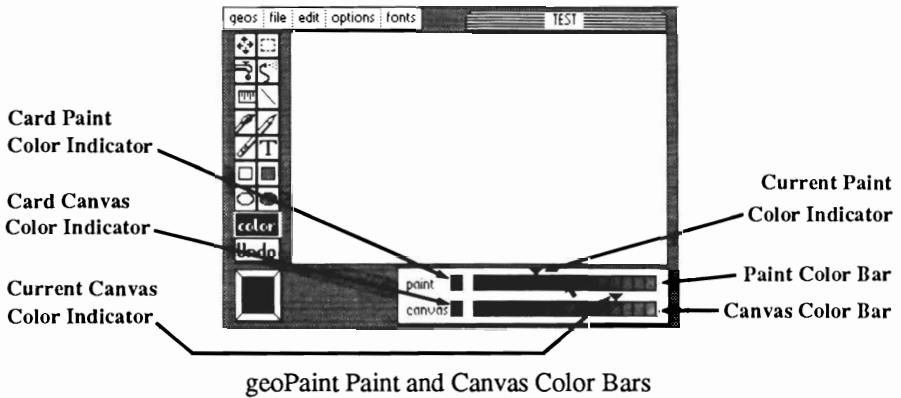
Choose a paint color from the upper color bar and a canvas color from the lower color bar.

Now move the Pointer to the picture. Click once to activate **Color** and wipe these new colors over the existing picture. Click again to deactivate **Color**.

If you wish to change the paint (foreground) color over several cards, without changing the *canvas* color of those cards, click on the Card CanvasColor Indicator (to the left of the lower color bar). Then move into the picture, click and wipe. The wiper is now "transparent" to the canvas color—it changes only the foreground color.

Color Off

If you prefer to draw in "black and white", you can disable color usage by selecting **color off** in the **options** menu. Whatever Drawing Tool you use will then draw dark gray on a light gray background. Select **color on** again to enable colors.

Drawing Tools and Shapes

geoPaint provides several drawing tools and shapes. Each tool produces a different graphic effect. The pencil, paint brush and air brush let you draw freehand. Lines, rectangles and circles provide you with an easy way to draw geometric shapes. Use the faucet to fill in with patterns.

Using the Pencil

The **Pencil** draws individual points and free-hand lines. To use the Pencil, click on the Pencil icon in the Tool Box. The Pointer looks like a pencil as it moves across the Drawing Window. Click once to activate the Pencil. It will be colored black to remind you that it is active. Sketch a line in the Current Color by moving the Pencil around in the Drawing Window. Click again to turn the Pencil "off". To plot a single point, click the Pencil on, then off without moving it.
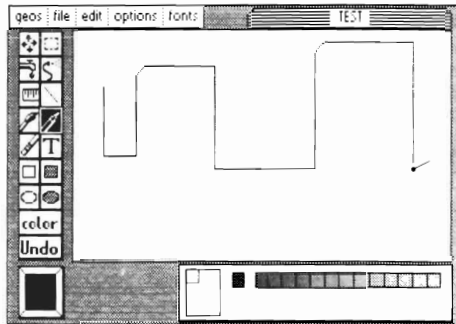
Drawing with the Pencil

Using the Paint Brush

The **Paint Brush** paints with any of 14 different brushes using the pattern displayed in the Current Pattern Indicator. (To select a different brush shape, see "Changing the Current Pattern" in the Special Commands section later in this chapter). Click on the Paint Brush icon in the Tool Box. As you move the Pointer onto the Drawing Window it will take the shape of the currently selected brush, a solid circle for example. Click once to activate the brush and begin painting. Click again to quit painting.
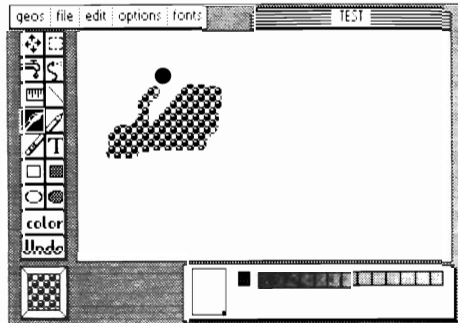
Drawing with the Paint Brush

Using the Airbrush

With the **Airbrush** you can paint large areas with the Current Pattern in a variety of intensities. Click on the **Airbrush** icon and point where you wish to begin. Click once to start spraying. By "spraying" the airbrush over your document you apply one "coat" of the Current Pattern. The more coats of the pattern that you apply in this manner, the more distinct the pattern becomes (until it is as sharp as if you had used the Paint Brush). Click again to stop spraying.
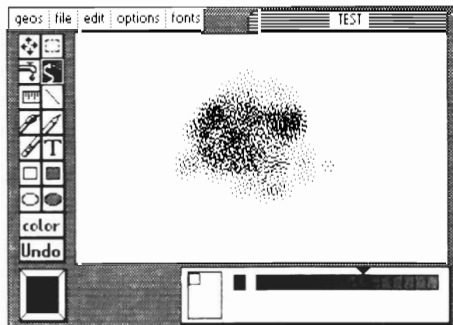
Drawing with the Airbrush

Using the Faucet (Pattern Fill)

The **Faucet** is used to fill an enclosed area with the Current Pattern. Note that if you use the **Faucet** in an unenclosed area, the pattern will "leak" out and may even fill the entire Drawing Window (which you *can* undo). To start, select the Faucet icon. Move the "cross-hair" pointer to a position within the enclosed area and click once to fill the area. To select a different pattern, see the "Special Commands" section later in this chapter.
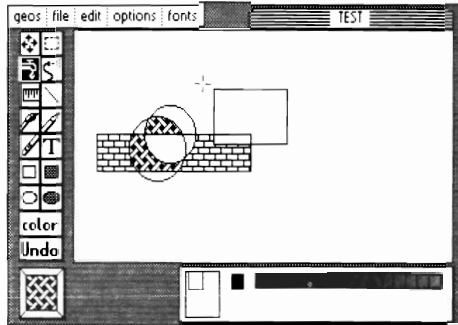
Filling an area with the Faucet

Drawing Straight Lines

Select the Line icon to add straight lines to your document. Note that the pointer takes on the appearance of a cross-hair as it moves across the Drawing Window, allowing you to accurately place the start and end points of the line. Click once to begin the line. Now stretch the line out on the screen in any direction. It will shrink or extend like a rubber band until you "tack" it down by clicking again. You may draw several lines in this fashion, clicking at the start and end points of each line.
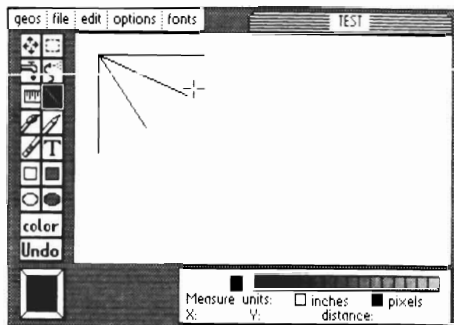
Drawing Straight Lines

Drawing Squares and Rectangles

geoPaint lets you draw two different types of squares and rectangles: hollow and filled. To draw a hollow square or rectangle, select the **Hollow Square** icon in the Tool Box. Position the "cross-hair" Pointer on the screen and click. This will fix one corner of the rectangle. Drag the pointer to a location diagonally opposite the starting point to complete the rectangle. Vary the rectangle, using the measuring units displayed in the Status Window, until you achieve the size and shape you desire (see also "Measuring Distances"). Click once and the rectangle will be permanently placed on the screen.

You may draw a *filled* square or rectangle in the same manner by selecting the **Filled Square** icon and clicking at the two corner points as indicated above. The completed square or rectangle will be filled with the Current Pattern. To select a different pattern, see the "Special Commands" section later in this chapter.

Drawing Circles

geoPaint also allows you draw hollow or filled circles very easily. To draw a hollow circle, select the **Hollow Circle** icon. Position the cross-hair Pointer where you want the center of the desired circle and click once. As you move the Pointer out, a circle is drawn between the start point (center) and the pointer. Vary the circle until you achieve the size you desire. Click once and the circle will be permanently placed on the screen.

You can draw a *filled* circle in the same manner by selecting the **Filled Circle** icon and clicking at two points as indicated above. The completed circle will be filled with the Current Pattern. To select a different pattern, see the "Special Commands" section later in this chapter.
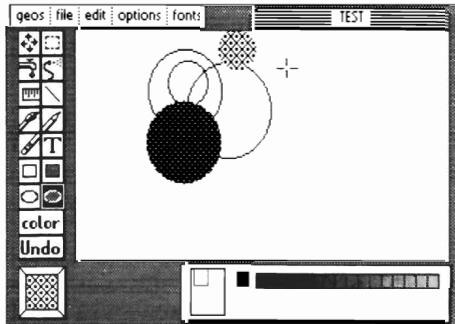
Drawing Hollow and Filled Circles

NOTE: You probably will notice that circles appear slightly elongated on the screen (that is, they are not perfect circles). This is because dots in GEOS are ideally square. But the dots on the screen, are slightly rectangular. This results in circles that are slightly distorted on the screen.

Adding Text

To add text to your document, click on the **Text** icon (the "T"). Define a rectangular region in the Drawing Window; then type your text. This rectangular area is called the **Text Region**.

Opening a Text Region
After clicking on the **Text** icon, position the cross-hair Pointer on the screen and click. This will fix one corner of the Text Region. Drag the pointer to a location diagonally opposite the starting point to open up the Text Region. You will see a dotted rectangle. Move the cross hairs to the size and shape you desire. Click once and the Text Region will be opened and placed on the screen.

Entering Text
Notice that once the Text Region is formed, the cross-hair Pointer becomes shaped like an "I-beam". In addition a flashing "line" cursor (Text Cursor) appears in the upper left corner of the Text Region. The Text Cursor marks the active insertion point for new text. The "I-beam" is used to reposition the text cursor in a new location for inserting additional text.

As you enter text it will fill the Text Region. If you reach the right side of the Text Region while typing a word, geoPaint will "wrap" the entire word to the beginning of the next line. This allows you to continue typing. You may insert up to 254 characters (including spaces) into the Text Region. Any text entered that exceeds the length of the Text Region is stored in memory and can be displayed by resizing the Text Region (see "Changing the Position and Layout of Text" on the next page).

Changing Text
To make changes to the text, point with the I-beam to a location in the Text Region. Click once to position the Text Cursor. You can either insert more text or use the DEL key to remove portions of text.

Selecting a Font and Style

To select a font (typeface), click on **fonts** in the **command** menu. Select a font and point size. The Status Box displays the available **type styles** when in Text mode. Select one or more style combinations by clicking the button next to the style desired. To disable a style, select different style.

Any font or style you select affects all of the text in the Text Region. You may however change to another font or style at any time.

Changing the Position and Layout of Text

geoPaint allows you to change the size and position of the Text Region. Simply move the I-beam to a point outside the Text Region and click to define one corner of the new Text Region. Open the new Text Region and click to select the opposite corner in the same manner as "Opening a Text Region". All of the existing text will reformat itself to correctly fill the new Text Region.
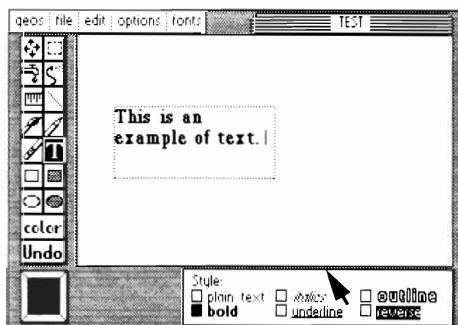
Entering Text

Placing the Text Region into the Text Scrap

All the text in an "open" Text Region may be "cut" or "copied" into the **Text Scrap** for use elsewhere in geoPaint, or in other applications. A Text Scrap is an actual file (on the disk) used for temporarily storing a "single" portion of text you have selected. The Text Scrap file holds only one selection of text at a time. Each time you cut or copy text into the Text Scrap, you will replace the current contents of that file with the new text.

To cut or copy the Text Region into the Text Scrap, select **cut** or **copy** from the **edit** menu. Cut will remove the text from the screen and place it into the Text Scrap; copy will leave the original text on the screen and place a duplicate version of the text in the Text Scrap.

Pasting the Text Scrap into the Text Region

To retrieve (paste) text which has been previously cut or copied to the Text Scrap, you must first click on the text icon and open a Text Region for it. Then select **paste** from the edit menu. The contents of the Text Scrap will appear in the Text Region in the currently selected font, point size and style. Once placed into the Text Region, you may change the text any way you wish.

Closing the Text Region

You can continue to reposition and edit the Text Region until you achieve the layout you desire. To permanently place text on the screen, and "close" the Text Region, click on the **Text** icon or any other drawing tool icon. (Once you have done this, the only way to delete text is with the eraser or by painting over it.)

Correcting and Detailing

geoPaint lets you correct what you have drawn with the **Undo** command, the **Recover** command, or the Eraser. You can also make detailed changes with **Pixel Edit.**

Using the Undo Command

If you make a mistake while using geoPaint don't panic! Just click on the **Undo** command at the bottom of the Tool Box. geoPaint will reverse your last change, restoring the original graphics. **Note**: Undo cannot be used to "undo" itself.

Using Recover To Undo Changes

Any changes you make in the Drawing Window are stored temporarily in memory. They become permanent changes only when they are "saved" onto the disk. This occurs when you scroll the Drawing Window vertically, **update,** or **close** the document. To reverse all of your temporary changes, use the **recover** command in the **file** menu. geoPaint will recover the last "saved" version of the document from the disk. Any temporary changes you made in the Drawing Window will be lost and will no longer appear.

Using the Eraser

To erase portions of your document, click on the **Eraser** icon. Move the pointer to the Drawing Window and click once to activate the Eraser. When activated, the Eraser will appear pink to indicate that it is erasing. The Eraser will remove any foreground color it slides over in the Drawing Window. Click again to deactivate the Eraser.
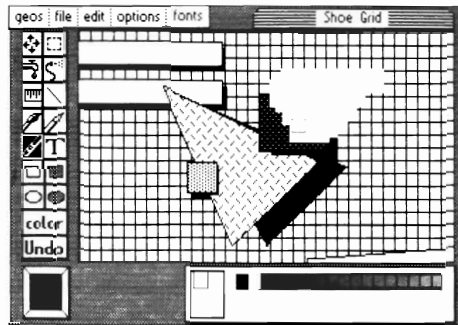
Erasing

Use the Pixel Edit mode (explained on next page) to erase in greater detail. Double-click on the **Eraser** icon in the Tool Box to erase in greater detail .

Detailing with Pixel Edit
To add fine detail to your document, switch the Drawing Window to **Pixel Edit** mode. In this mode, a small portion of your document is enlarged so that each dot (pixel) is magnified and easier to edit.

To enter Pixel Edit mode you may either select **pixel edit** in the **options** menu, or double-click on the **Pencil** icon. An editing box will appear in the upper left corner of the Drawing Window. Position the box on the region you want to "magnify." Click once. The Drawing Window will display the area you selected in an enlarged format. An actual-size representation of what is contained in the Drawing Window is displayed to the left of the Status Box. Use this smaller window to see how changes in the Pixel Edit mode will appear in the document.
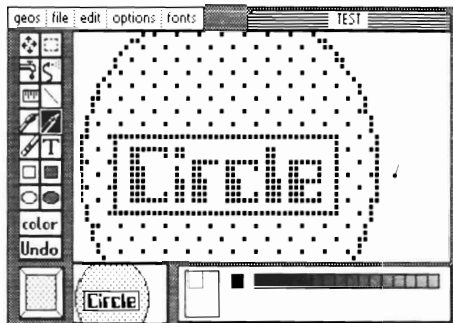
Detailing with Pixel Edit mode

In Pixel Edit mode the Pencil can be used to both draw and erase pixels. If you click the Pencil on a blank pixel (i.e., a pixel set to the canvas color), the Pencil will draw in the current paint color. If you click the Pencil on a set pixel (i.e., a pixel set to the paint color), the Pencil will become an eraser removing pixels set to the paint color.

Using the Drawing Tools in Pixel Edit Mode
While using the Pixel Edit mode, you may use several of the standard drawing tools from the Tool Box. You will probably find the Pencil, Line, and Eraser most useful in this mode.

Exiting Pixel Edit Mode

To return to normal edit mode, you may either select **normal edit** in the **options** menu or double-click on the Pencil icon.

Editing Selected Regions

With geoPaint you can perform several editing operations on selected rectangular regions of your document. Click on the **Edit Box** icon in the Tool Box to select such an area.

Opening an Editing Region

Position the cross-hair pointer on the screen and click. This fixes one corner of the Edit Box. To open the Edit Box, drag the pointer to a location diagonally opposite the starting point. Notice that the Edit Box is a dotted rectangle. Move this point around until you have enclosed the region that you wish to edit, and click again to select it.

If you wish to select the *entire* Drawing Window, double-click on the Edit Box icon. This selects the entire visible image.
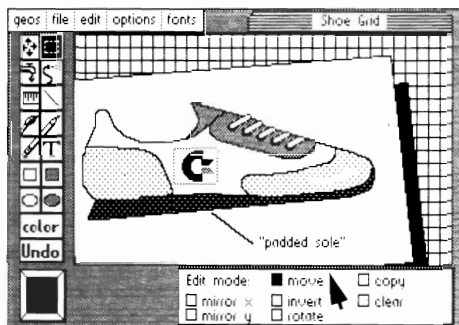
Selecting a rectangular area

Moving or Copying the Selected Region

Once you have selected an image with the **Edit Box**, you can move that image to a new location. To do this, click on the **move** button (the button turns solid black), position the cross-hair pointer within the selected region and click once. This attaches the selected region to the cross-hair. Move the image to the new position and click again to deposit it. When you perform a move in this fashion, the area where the image came from is cleared.

You can also *copy* a selected area. Click on the **copy** button in the Status Box to copy an area. Position the cross-hair within the selected region and click once. This will attach the selected region to the cross-hair. Move the image to the new location and click again to deposit the image. In copy mode a duplicate of

the selected region is created leaving the original image unchanged. To make additional copies simply click again and reposition the new copy to another location.

Mirroring

The **mirror** commands let you flip an image either horizontally or vertically. Once you have selected an image with the **Edit Box**, clicking on **mirror x** flips the selected region horizontally (left to right). Clicking on **mirror y** flips the selected region vertically (top to bottom).

Inverting

Once you have selected an image with the **Edit Box**, clicking on the **invert** button causes the selected region to reverse in color (black to white; white to black).

Rotating

Once you have selected an image with the **Edit Box**, clicking on the **rotate** button will rotate the selected region 90 degrees. Each additional click will rotate the region another 90 degrees.

Clearing

Once you have selected an image with the **Edit Box**, clicking on the **clear** button will erase the image in the selected region.

Placing the Selected Editing Region into the Photo Scrap

Once you have selected an image with the Edit Box, you can move it into other applications such as a Photo Scrap. A Photo Scrap (like a Text Scrap) is an actual file on the disk used to temporarily store a selected graphic image. NOTE: The Photo Scrap file holds only one selected region at a time. Each time you cut or copy a region into the Photo Scrap, you will replace the *current* contents of that file with the new region.

Select **cut** or **copy** from the **edit** menu to cut or copy the selected region into the Photo Scrap. Cut will remove the region from the screen and place it into the Photo Scrap; copy will leave the original region on the screen and place a duplicate version of that region in the Photo Scrap.

Pasting a Photo Scrap into a Selected Editing Region

To paste the Photo Scrap image into a geoPaint document, select the Edit Box icon and "open" a region in which to paste the Photo Scrap. Select **paste** from the **edit** menu. It is important to open a region large enough to contain the entire Photo Scrap, otherwise only a portion of the Photo Scrap will be pasted in. Once pasted into the Editing Region, you may make any changes you wish.

Pasting the Photo Scrap into a geoWrite Document

Use geoWrite to open your document. Position the Text Cursor where you would like the image to begin and select **paste photo** from the **edit** menu (see also "Using Graphics from geoPaint", **Chapter 5**).

Using the Photo Manager

Note that there can be only one Photo Scrap at a time. If you want to save several images from your document, you can use the Photo Manager desk accessory to collect them (see "Photo Manager", **Chapter 6**).

Special Commands

Updating and Saving Changes to the Document

geoPaint saves your recent changes onto the disk whenever you move up or down the page (scroll), or when you close the document. You may wish to update your file more frequently, however, if you have just made an especially important change or are working with a very detailed portion of a document. Use the **update** command in the **file** menu to save your most recent changes onto the disk.

Recovering Your Document from the Disk

Should you decide that you want to reverse all of the changes you made since your document was last updated on the disk, you can use the **recover** command in the **file** menu. geoPaint will re-open your document and restore the screen to the last saved (or updated) version of your document.

Renaming a Document

You can rename the document you are working with by selecting **rename** from the **file** menu. Enter the new file name into the dialog box and press RETURN. **NOTE: Rename** does not create a duplicate copy of your document under a new name. Rename merely changes the name of the current document. For making copies of documents see "File Management", Chapter 3.

Preview Page

As mentioned earlier the standard geoPaint Drawing Window reveals only a portion of your entire document at a time. You can however display a "compressed" version of the entire page by selecting **preview** from the **file** menu (4 to 1 ratio). While it does lack some of the detail, it allows you to make decisions about the overall placement and proportions of your document.

Select **OK** from the dialog box to resume working with your document.
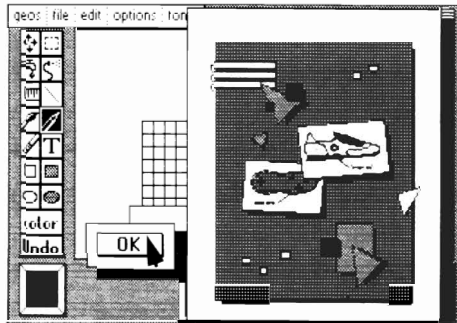
geoPaint Preview Mode

Moving the Drawing Window

There are two ways to move the Drawing Window to a different section of your document: the Scrolling Arrows and the Page Map. The Scrolling Arrows are useful for finer positioning and more precise movement around the document. Selecting the **Scrolling Arrows** in the Tool Box will display a four-direction arrow in the middle of the Drawing Window. Move the joystick in the direction you wish the Drawing Window to move over your document. As you move over the document, the Page Map in the Status Box displays your relative position on an 8-1/2 x 11 inch page. The Scrolling Arrows are useful for more accurate movement and finer positioning on the document.

The **Page Map** is useful for getting from one end of the page to the other very quickly. Position the arrow Pointer at any location on the Page Map and click. The box representing the Drawing Window will become attached to the Pointer. Use the pointer to move the box to the portion of the document on which you wish to work. Click again, and the "actual" Drawing Window will appear over that location.

Measuring Distances

Often, when working with a particularly precise drawing, you may need to measure distances, or create scale figures on your document. There are several tools that perform measuring functions: the Line, Hollow and Filled Rectangles, and the Ruler. The Line, Hollow and Filled Rectangles are actual "drawing" tools: the scale images they create become permanent figures on the document.

The **Ruler,** however, is strictly a measuring device (similar to a tape measure) that leaves no permanent image on the screen. Click on the Ruler and position the cross-hair pointer at a start point. Click again. As you pull the line out, the Status Box displays the distance in either inches or pixels. When you reach the end point, click again and the ruler line will disappear (just like a tape measure snapping back), capturing the final distance. Click on the inches button to change units from pixels to inches.
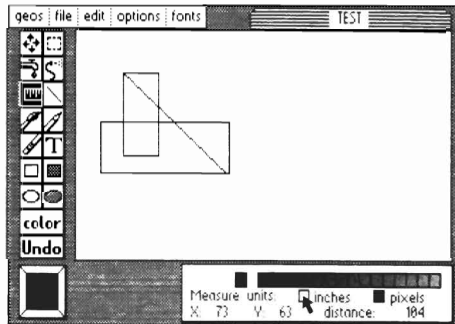
Measuring Distances with the Ruler

Note that, as with all the measuring tools, the pixel measurement is in actual dots on the screen. Inches are based on "printed" inches (not "screen" inches) of 80 dots to the inch. The accuracy of any printed document depends, therefore, on the resolution of your printer. For example, on an 80-dot per inch printer, a 1-inch line created in geoPaint prints out 1 inch long. On a 60-dot per inch printer that same line would print out 1.3 inches long.

Changing the Current Pattern

To select a new pattern, click on the Current Pattern Indicator to display the **Pattern Options** in the Status Box. Once inside the Pattern Options, you must choose a pattern before you can return to the Drawing Window. Point to any pattern you wish and click once. The new pattern appears in the Current Pattern Indicator and is available for use by different tools: Faucet, Paint Brush, Airbrush, Filled Rectangle and Circle.
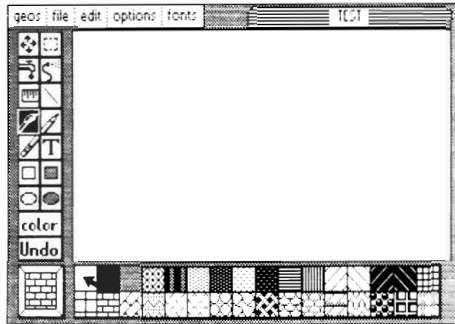
Choosing a Pattern from the Pattern Menu

Changing the Brush Shape

To change the shape of the Paint Brush, select **change brush** from the **options** menu or double-click on the Paint Brush icon. The Status Box will display a box containing the 32 different brush shapes. The currently selected brush will have a square surrounding it. Once inside the Brush Shape Box, you must select a brush before you can return to the Drawing Window. Point to any brush shape you wish and click once to select it.
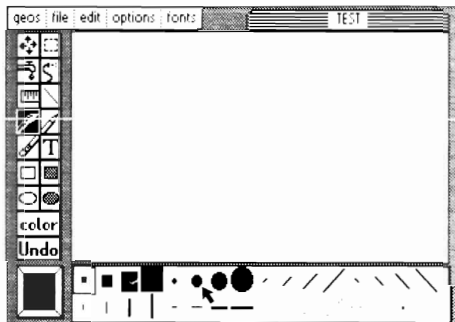
Choosing a Brush Shape

Printing Your Document

In order to print your document, the Printer Driver for your printer must first be selected, and must be on the disk with geoPaint. If you have not already done so, return to the deskTop and choose the correct printer (see "GEOS Training Camp", **Chapter 2**).

With the correct Printer Driver selected, turn on the printer and align the top of the form. Select **print** in the **file** menu to print your document.

NOTE: The printed resolution of a geoPaint document is based on 80 dots per inch on an 8-inch wide page (640 total dots). Printers that support less than this resolution--60 dots per inch, (480 dots total), for example--may produce only a portion of the geoPaint document.

NOTE: Some printer configurations will require that the printer be turned on before turning on the computer.

Leaving geoPaint

Closing the Document
The close option is useful if you wish to stop working with one geoPaint document and begin work on another. Select **close** from the **file** menu to close and save your current document onto disk, but not to exit geoPaint. Instead a dialog box will appear allowing you to Create a new document, Open an existing one, or Quit geoPaint and return to the deskTop.

Closing and Quitting
Select **quit** from the **file** menu to close the current document, save it to disk, leave geoPaint, and return to the deskTop.

Chapter 5: geoWrite
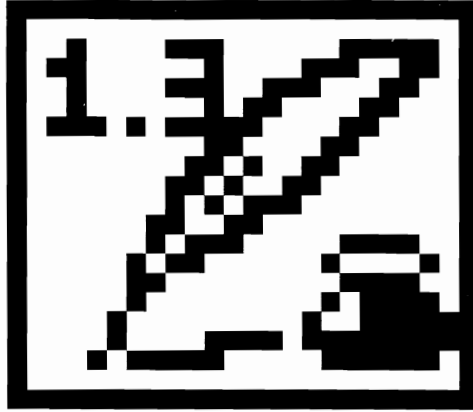
This section covers geoWrite, a powerful word processor, which allows you to create multi page documents with multiple proportionally spaced fonts in different styles and point sizes. This chapter explains how to:

- enter geoWrite
- type a document and delete text
- move around in a document
- format a page with margins, tabs, and page breaks
- use font and type styles
- insert pictures from geoPaint
- use text from other documents
- print your document
- leave geoWrite

The geoWrite Screen

Command Menu
Text Cursor
Pointer
Page Indicator
Writing Window
Title Bar
Ruler
Scroll Box
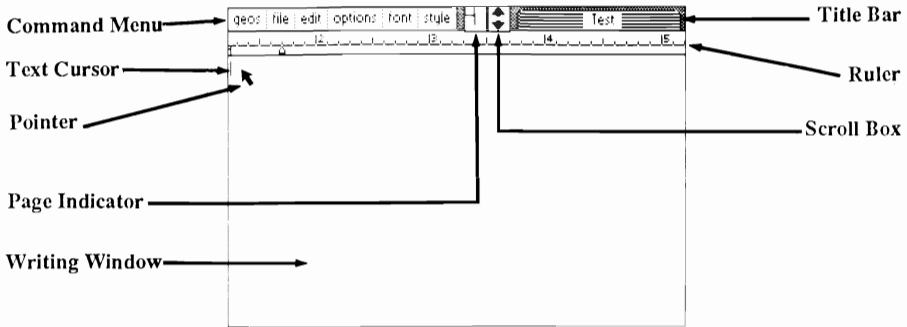
As shown above, the geoWrite **Writing Window** occupies most of the screen and serves as a window into each page of your document. The **Command Menu** lies along the top of the screen. This menu gives you access to some of geoWrite's more specialized commands. The commands are divided into six groups: **geos, file, edit, options, fonts,** and **styles**. Click on one of these menu names to pull down a menu of additional commands. Then simply click on the desired command.

To the right of the Command menu you will find the **Page Indicator**. This box has two uses; it displays the page number of the page visible in the Writing Window, and it can be used to move the writing window to a different portion of the current page.

You may also scroll the Writing Window using the the **Scroll Arrows** located just to the right of the Page Indicator. These arrows scroll the page one line, up or down depending on the arrow clicked.

The **Title Bar** in the upper-right corner displays the name of the document you are working with.

The **Ruler** is located directly below the Command Menu. It lets you change the format of your document.

Inside the Writing Window you will notice the **Pointer** and **Text Cursor**. The Text Cursor indicates your active position in the Writing Window—that is, where the next typed character will appear.

Entering geoWrite

If you have not already done so, read **Chapter 2**, "GEOS Training Camp".

Entering geoWrite from the deskTop

When you are on the deskTop, there are two ways to enter geoWrite. You can select the geoWrite icon on the Disk Notepad and then select **open** from the **file** menu, or you can double-click on the geoWrite icon. In both cases geoWrite will load and display a dialog box on a blank screen. It will contain three options: Create document, Open document, and Quit. Select one.
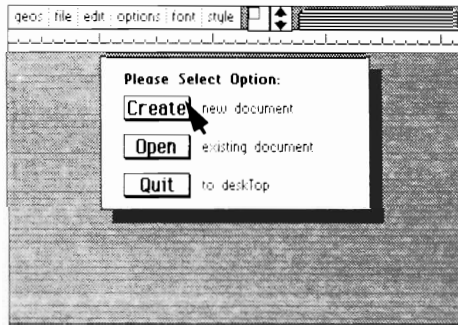
geoWrite Create/Open/Quit Dialog Box

Create Document

Use this option to create a new geoWrite document. A second dialog box will pop up, displaying the name of the currently opened disk. Enter a name for your new document and press RETURN.

If you have installed two disk drives, and would rather create the document on the disk in the other disk drive, click on the **Disk** button once. This will activate the other disk. Enter a name for your new document and press RETURN.

Open Document

This option opens an existing document on the disk. A second dialog box will appear, displaying the name of the currently opened disk and a list of the first five geoWrite documents on the disk. If there are more than five documents on the disk, click on the lower scroll arrow at the bottom of the box. Each time you activate this scroll arrow, another document name will scroll into view. Highlight the document you desire by clicking on its name once. Click on the Open button to open that document.

If you have installed two disk drives, and would rather open a document on the disk in the other disk drive, click on the **Disk** icon once. This will activate the other disk. Highlight the document name and click on the Open button to open that document.

NOTE: Only 15 documents can be displayed in the **open** dialog box window. It is unlikely you will have more than this on a single 1541 disk. If you do, you will have to rearrange the files on the deskTop to be able to access later files through the open dialog box window.

Quit

Select this option to exit geoWrite and return to the deskTop.

Opening an Existing Document from the deskTop

Once you have created a document, you can open it by selecting the document icon on the Disk Notepad and activating **open** from the **file menu,** or you can double-click on the document icon. Either procedure will automatically load geoWrite and then open your document.

Running geoWrite with the RAM Expansion Unit (REU)

If you own the Commodore RAM Expansion Unit and have installed the REU GEOS KERNEL, you should always run geoWrite on RAM disk. We recommend creating a geoWrite work disk containing REU, deskTop, geoWrite, Photo Manager desk accessory, and any other desk accessories you desire. Use the **copy** command on the **disk** menu to copy the work disk onto the RAM disk. Create and edit your documents on the RAM disk. Be sure to copy the document to the 1541 disk drive before turning the system off. For more information on the RAM Expansion Unit, read the section on the REU in the deskTop chapter.

Entering Text

To enter text into your document, simply start typing. The text you type will appear in the Writing Window at the location of the text cursor. To change the position of the text cursor, move the pointer to another location and click. The cursor will be repositioned to that point. If you click the pointer past the last character currently in the document, the cursor will appear after that character.

| geos | file | edit | options | font | style | | | Test |

Almost a hundred different elements
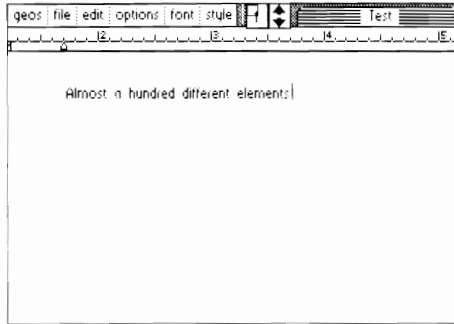
Entering Text Into the Writing Window

Using Delete

Should you make a mistake as you are typing, you can delete one or more characters on the line by using the DEL key on the keyboard. This moves the Text Cursor backward on the line, deleting characters as it goes.

Writing Window and Document Dimensions

The ruler at the top of the Writing Window starts at 1.2 inches on the initial screen and spans to 5.4 inches. If you move the pointer to the right edge of the Writing Window, the screen will instantly shift to display the right two-thirds of the document. The left visible edge of the ruler, when on the right side of the document, is 3.2 inches. The right edge of the ruler is 7.4 inches. The total span of the writing area on a geoWrite document is 6 inches (1.2 inches on the left side to 7.2 inches on the right side). There are minimum margins of 1.2 inches on the left side and 1.3 inches on the right.

NOTE: The document dimensions described here are based on a print resolution of 80 dots/inch. If your printer has a different resolution, the dimensions will be slightly different.

Word-Wraparound

If you reach the right margin of the page when typing a word, geoWrite will pick up the entire word and move it to the beginning of the next line and allow you to continue typing. In most word processing using geoWrite you should let the word wrap create the new lines within paragraphs, rather than entering RETURN. If you follow this guideline, paragraphs will automatically reformat when you delete words or sentences.

Ending a Paragraph

To end the paragraph you are currently typing, simply press the RETURN key on the keyboard. This moves the Text Cursor to the start of the next line.

Using Tabs

geoWrite allows you to set several tab-stop positions across the width of your document. Once you have set these tab positions as described in "Setting Tab Positions," you can use them to format your document. To skip to a tab position as you are entering text, press CTRL-I. The Text Cursor will advance to the tab position.

NOTE: The C-64 keyboard does not have a **tab** key. A tab is entered with a CTRL-I. This is done by holding the CTRL key down and striking the letter I.

Inserting a Page Break

If you are entering text and you want your next paragraph to start on the top of the next page, select **page break** in the **options** menu to insert a Page Break.

Preview Page

Since the standard geoWrite Writing Window only allows you to view a portion of one page at a time, you may use **Preview Page** to get a full-screen preview of a page. Activate **preview** under the **file** menu. Preview is very useful since it allows you to make decisions about the overall placement and proportions of a page. Once you have examined the page preview, click on the OK button in the dialog box in the lower left-hand corner of the screen.

Moving the Writing Window

Since the Writing Window displays a portion of one of the pages of your document, you will often want to move the window over a particular portion of the document.

Moving Within the Current Page

There are several ways to move the Writing Window within the current page. The first method is a side-effect of entering text. As you type in a paragraph, the Writing Window will alternately display the left and right sides of the page, scrolling down the page to supply new lines. You can also manually scroll the Writing Window up or down on the page by clicking on one of the arrows in the Scroll Box. The up arrow scrolls the Writing Window upward one line on the page; the down arrow scrolls downward one line .

You can also use the Page Indicator to move the Writing Window. The Page Indicator box itself represents the size of a page and the small square inside the box represents the area of the page visible in the Writing Window. To change the location of the Writing Window, click once inside the Page Indicator. The small square representing the Writing window will become attached to the pointer. Move the square to the portion of the page you wish to view and click. That section will appear in the Writing Window.

Moving Forward or Backward One Page

To move the Writing Window forward or backward one page, select either **next page** or **previous page** from the **options** menu.

Moving to Any Page

To move the Writing Window to any arbitrary page in your document, select **goto page** from the **options** menu. Enter the page number in the dialog box that appears, and press RETURN.

Editing Your Document

Inserting Text

Inserting text into your document is similar to entering text: simply point to where you want to add text and click once to position the Text Cursor at that spot. Now you may begin typing on the keyboard.

Inserting Text Into a Multipage Document

It is important to realize that when you insert text into a multipage document the pages following the text you have inserted may also be affected. When you move off of this page, or close the document the program will update the following pages. You can minimize the amount of additional page reformatting by inserting page breaks at the appropriate places - - e.g., the end of sections or chapters.

Deleting Text

To delete text, point the Text Cursor at a point immediately after the character or word you want to delete. This positions the Text Cursor. Now simply press the DEL key several times to delete this text. To remove larger sections of text, use the "select" feature.

Selecting Text to Move, Copy, or Delete

To work with several characters, words, sentences, or paragraphs at a time, you must first **highlight** this text. Point to the first character of the text. While holding the joystick button down move the cursor to the last character and release the button. The text will be highlighted as you go along.

NOTE: When you select more than one line, you select all of the text between the start and end points you specify, even if portions of the text are on the one-third of the document not visible in the Writing Window.
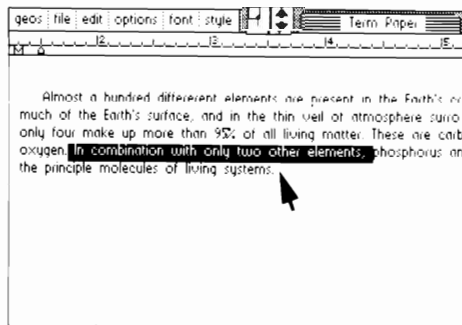
You may perform several different operations on a selected block of text:

- Replacing Selected Text
  To replace the highlighted text with new text, enter the new text on the keyboard. The highlighted text will disappear and the new text will be inserted.

- Deleting Selected Text
  To delete the selected text, simply press the DEL key once.

- Changing the Font or Style of Selected Text
  You may change the Type Face or Style of the text you have selected. See "Using Different Fonts and Styles" later in this chapter for instructions.

- Cutting Selected Text for Moving or Copying
  In order to move or copy text to another section of your document, you must "cut" or "copy" it from its current position and "paste" it into the new position. Select **cut** from the **edit** menu to cut the selected text out of the document. geoWrite will remove the selected text and place it in the Text Scrap. The **copy** command also places the selected text in the Text Scrap, but will not remove it from the document.

Pasting Text into the Document

Position the Text Cursor where you want to paste the text. Select **paste text** from the **edit** menu. geoWrite will insert the contents of the Text Scrap where the Text Cursor is positioned.

Formatting

The Ruler

You can change the margin and tab positions on the currently visible page using the geoWrite Ruler. As shown below, the Ruler appears along the top of the screen:
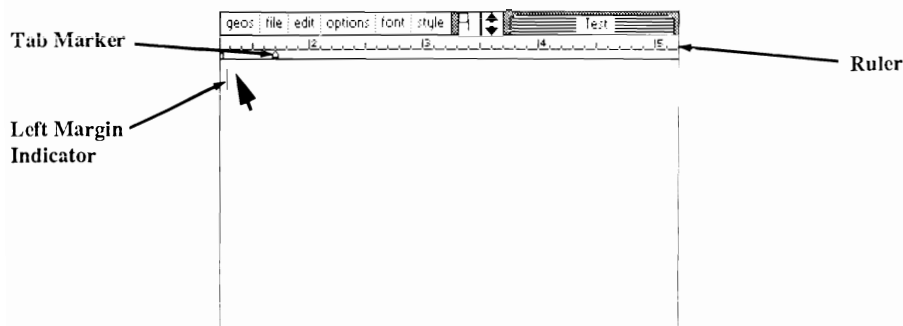
geoWrite Screen Showing Ruler

Setting Left and Right Margins

On the left and right sides of the Ruler you will find two margin markers which resemble the letter M. These two markers define the left and right margins for your text. To change the position of one of these markers, click on it once, drag it along the Ruler, and click again to drop it.

Setting Tab Stops

geoWrite allows you to set up to eight independent tab-stop positions on each page. For each tab-stop position there is a corresponding tab marker on the Ruler. To set a tab, point to a spot on the ruler and click once. To change a tab's position, click on it once, drag it along the Ruler, and click again to drop it. To remove a tab, drag it up to the top half of the ruler and click.

Inserting Page Breaks

geoWrite allows you to insert a page break at any point in your document. The text immediately following a page break will appear on the top of the next page. To insert a page break, select **page break** from the **options** menu.

Deleting Page Breaks

To delete a page break, position the text cursor at the top left of the page following the page break. Press DEL. A dialog box will ask if you want to delete the last character of the preceding page. Select **OK**. The page break will be deleted and the cursor will appear on the bottom of the previous page.

Using Different Fonts and Styles

Choosing a Font

You may choose a font and point size at any time in geoWrite. Simply select the desired font from the **font** menu and begin typing.

Changing the Font of Selected Text

Once you have selected a section of text as described in "Selecting Text" you may choose a new type face for it from the **font** menu. Just pull down this menu and select one of the fonts and point sizes listed in the menu.
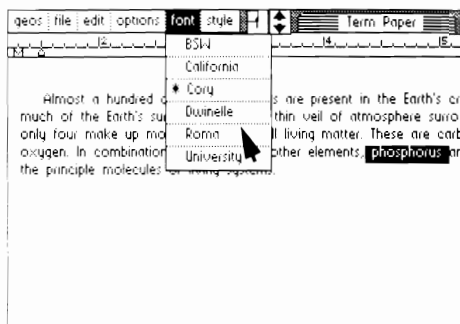
Changing Fonts

Changing the Style of Selected Text

You may also change the style of the text you have selected. First pull down the **style** menu to reveal the styles available, such as **boldface** and underline. You can select one or more of these styles. Click on one of the style names to enable. Simply click on the style option again to disable a style change.

Editing Tips

Pulling the Right Margin In
When you are first entering the text into your document, we recommend that you set the right margin at 5 inches. This will keep the body of text on the left side of the screen and avoid the screen shifting from right to left. This also makes it easier to read the paragraphs you are entering. After entering the text, you can move the margin back to set the actual printing format.

Let the Word Wrap Work for You
Be sure to allow the word wrap to occur for new lines, and only enter carriage returns at paragraph boundaries. This will make re-formatting much easier since the software will fill out paragraphs to match the margin boundaries.

Use a Single Small Font to Enter Your Draft
If you are entering a large document, use a single font in a small point size to enter your first draft. This will allow you to view more of the document on one page and minimize disk access for additional font information. After you have gotten your thoughts down, go back and change the text to the desired fonts and sizes.

Use Page Breaks in Large Documents
geoWrite documents can grow up to 64 pages - - assuming enough disk space is available. In large documents, you should insert page breaks wherever appropriate. This will minimize performance degradation. The basic logic is this: If you have a large document with no page breaks, as you insert a character on the first page, it might push the last character on the first page down to the second page and so on, causing a ripple down effect that may involve every page of the document. By inserting a page break, the software only has to ripple the changes down to the

Updating the Document as You Work
After entering a considerable amount of text on a page, you may wish to select **update file** from the **file** menu. This will write your current changes to the disk and protect against losing this data.

Recovering a Document from Disk
If you accidently delete a large section of text from a page, or wish to **undo** all of your recent editing changes, selecting **recover** in the **file** menu will recover the last saved version of the current page.

Keyboard Shortcuts

Shortcuts allow you to select frequently used menu and ruler items directly from the keyboard. Shortcuts are selected by holding down the Commodore key "@", and pressing the particular key for the short cut desired. The shortscuts for menu items are listed below:

Edit Menu:	cut:	**C=** , and **X**
	copy:	**C=** , and **C**
	paste(text):	**C=** , and **T**
	paste(picture):	**C=** , and **W**

Options Menu:

previous page:	**C=** , and **(left arrow)**
next page:	**C=** , and **+**
goto page:	**C=** , and **G**
page break:	**C=** , and **L**

Style Menu:	plain text:	**C=** , and **P**
	bold:	**C=** , and **B**
	italic:	**C=** , and **I**
	outline:	**C=** , and **O**
	underline:	**C=** , and **U**

Cursor Keys:

The cursor keys on the Commodore keyboard (next to the right side shift key) can be used with geoWrite version 1.3 To move the cursor up, down, or left, directly from the keyboard, follow the directions listed below.

move right:	use left/right cursor key *only*
move left:	use **Shift** key *and* left/right cursor key
move down:	use up/down cursor key
move up:	use **Shift** key *and* up/down cursor key

Additional Characters

The following additional characters can be created by holding down the Commodore
Key and pressing the key indicated:

        ' { ' -- press **C=**, and [
        ' } ' -- press **C=**, and]
        ' | ' -- press **C=**, and ^
        ' _ ' -- press **C=**, and -
        ' \ ' -- press **C=**, and /
        ' ~ ' -- press **C=**, and *
        ' ` ' -- press **C=**, and @

Using Graphics from geoPaint

geoWrite allows you to mix geoPaint graphic images with your text. First see **Chapter 3**, "geoPaint," to copy an image into the Photo Scrap. Then place the Text Cursor where you would like the image to begin, and select **paste** in the **edit** menu. Another sub-menu will appear. Select **photo**. This will place the picture on the page, centered left-to-right between the margin. (geoPaint *always centers* the picture.) The picture must fit between the margins—there is no way to reduce a large picture to fit.

Showing and Hiding Pictures

Whenever geoWrite displays a page containing a picture, the bit-mapped image data for the picture must be loaded from the disk. Since this will slow geoWrite slightly, you may want to select **hide pictures** from the **options** menu. This will prevent the pictures from appearing in the Writing Window. Space for each picture will still be reserved in the document, and the pictures will be printed when **print** is selected. To show pictures in the Writing Window, select **show pictures** from the **options** menu.

Using the Photo Album

When you select **paste picture** from the **edit** menu, the current contents of the Photo Scrap file are used. If you have several pictures or charts you wish to create in geoPaint for pasting into geoWrite documents, you will probably want to use the **photo manager** desk accessory. Selecting the **photo manager** gives you access to any of the graphic images stored in the Photo Albums on the disk, allowing the cutting or copying of images from the Photo Albums into the geoWrite document. For more details see the "Photo Manager Desk Accessory" in **Chapter 5.**

Using Text from Other Documents

In order for text from one geoWrite document to be inserted into another, the text must first be cut or copied into the Text Scrap (see **"Selecting Text"**). Open the second document, position the Text Cursor, and select **paste text** from the **edit** menu. geoWrite will insert the text into the page.

Using the Text Album
The Text Scrap file used to paste text into a document only holds one section of text at a time. If you have several text sections you wish to copy from one geoWrite application to another, you will probably want to use the **text manager** desk accessory. The text manager will let you collect several text "clippings" into a **Text Album**. A text album can be opened, using the **text manager** desk accessory, while in another geoWrite document, allowing the cutting or copying of text from the Text Albums into the geoWrite document (see "Text Manager Desk Accessory", **Chapter 6**).

Printing Your Document

In order for your document to be printed, the correct printer driver must first be selected, and must be on the disk with geoWrite. If you have not already done so, return to the deskTop and select the correct printer driver. (See the printer section of **Chapter 2**, "GEOS Training Camp" and "Selecting a Printer" in **Chapter 3**).

With the correct printer driver selected, turn on the printer and align the top of form. Select **print** in the **file** menu to print your document.

NOTE: Some printer configurations will require that the printer be turned on before turning on the computer.

Leaving geoWrite

Closing the Document
You must close the document you are working with before leaving geoWri
Select **close** from the **file** menu. The document will be closed, and a dialog box
will appear. Choose one of the three options presented.

Closing and Quitting
Select **quit** from the **file** menu to close the current document and leave geoWrite,
returning to the deskTop.

Renaming a Document
You can rename the document you are working with in geoWrite by selecting
rename from the **file** menu. Enter the new file name into the dialog box, and
press RETURN.

Chapter 6: Desk Accessories
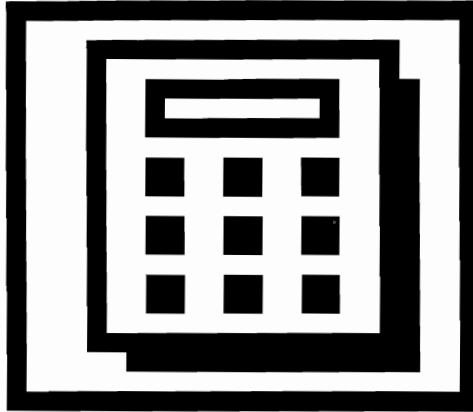
This section covers the GEOS Desk Accessories — helpful and convenient tools available anywhere in GEOS. It describes each of the Desk Accessories:

- the Alarm Clock
- the Calculator
- the Notepad
- the Photo Manager
- the Preference Manager
- the Text Manager

Desk Accessories Overview

The GEOS disk contains a number of useful programs called **Desk Accessories**. These programs are different from regular GEOS applications programs because they can be used *while* running any GEOS application. Simply select a desk accessory from those listed in the **geos** menu. The desk accessories will "pop up" in an application (or the deskTop) ready for use. For example, the Calculator desk accessory can be used while you are running the geoWrite application program, without having to exit geoWrite.

Any information that is beneath the desk accessory where it pops up is "swapped" out and temporarily stored on the disk as a **swap file**. When you are through with the desk accessory, the information from the swap file is replaced on the screen and you may continue working in the application.

Some desk accessories, because of their size or complexity, require up to 15K bytes free on the disk for a swap file. If you request a desk accessory and there is not enough space on the disk for the swap file, GEOS will automatically return you to the application. If you still wish to use the desk accessory, it will be necessary to move or delete files from the disk (see "File Management", **Chapter 3**).

Available Desk Accessories

All available desk accessories are listed under the **geos** menu in any application in the order they appear on the deskTop. To reorder the menu, for easier access to commonly used accessories, simply reorder the files on the deskTop (the left, uppermost item on the deskTop Disk Notepad will appear highest in the menu).

Depending on your needs, you may want to add or delete desk accessories from a particular disk. Since all desk accessories are treated as independent files by GEOS, you may add or delete them to tailor a disk to your individual requirements (see "Adding and Deleting Desk Accessories", **Chapter 2**).
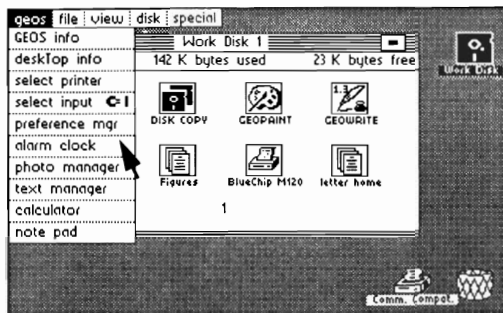
GEOS deskTop Showing Desk Accessories in GEOS Menu

Activating and Quitting a Desk Accessory

Select the desk accessory you want to use from the **geos** menu. The desk accessory will "pop up" over the current screen. When you have finished with the desk accessory, select its **Close**, or **Quit**, (or **Exit**) option to restore your original screen, and the status of the application program you were running.

Running Desk Accessories with the RAM Expansion Unit

If you own the RAM expansion unit and have installed the REU GEOS KERNEL, you should always run Desk Accessories on the RAM disk. This requires copying any desk accessories over to the RAM disk and working off of the RAM disk whenever you select a desk accessory. When activated from the RAM disk, a desk accessory will pop up almost instantaneously. Similarly, when you quit the desk accessory you will almost instantaneously return to the previously running application. For more information on the RAM Expansion Unit, read the section on the REU in the deskTop chapter.

Desk Accessories

The Alarm Clock

The Alarm Clock desk accessory may be called up to display the current time (if it has already been set), set the correct time, or set an alarm time. Once set, the clock and alarm are active anywhere in GEOS. Setting an Alarm will cause a tone to sound at the specified time.
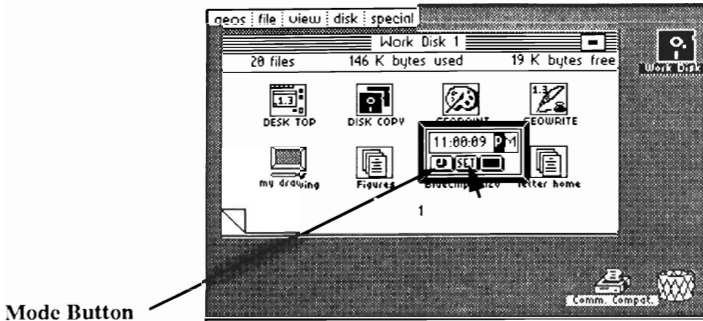
Mode Button

The Alarm Clock Desk Accessory

As shown above, the Alarm Clock is in alarm time mode. In this mode, the time is frozen and you can set the alarm time. To switch to clock time mode click on the Mode button once. Notice that the button graphically changes from a bell (alarm) to a clock face (clock). Each click on the Mode button will switch between alarm time and clock time.

The "highlighting" black cursor in the display window is used for changing the time in either mode. To reposition the cursor, point and click at a location (hours:minutes:seconds), or use the SPACE BAR to move through the digits. Use the number keys to enter a new time; then type A or P to indicate AM or PM.

To set the alarm, switch to alarm mode and enter an alarm time. Click once on the Set Button, or press RETURN. A Bell Indicator will appear signifying that an alarm has been set. To disable the alarm, click again on the Set Button, and the Bell Indicator will disappear.

To set the clock time, switch to clock time mode. The clock will freeze as you enter a new time. Click once on the Set Button, or press RETURN. The time will begin to advance.

To exit the Alarm Clock, click on the Close Button. For each of the three buttons, there is a corresponding key: M for Mode, RETURN for Set, and SHIFT Q for Close.

Desk Accessories 6-4

The Calculator

The Calculator desk accessory gives you the capability to do quick arithmetic while running any GEOS application. It operates in the same fashion as a typical four-function calculator.
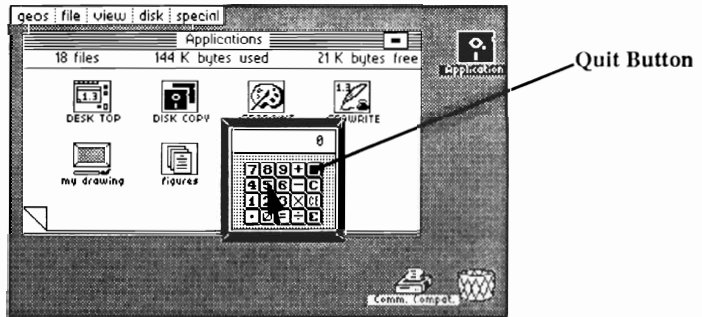
Calculator Desk Accessory in Use

To enter values and execute functions on the Calculator, you can either use the pointer and click on the calculator's buttons, or use the keyboard. Below is a list of the keys you will need to use for the Calculator.

Calculator Key	Keyboard Key
Add	+
Subtract	-
Divide	/
Multiply	*
E (Exponential)	E
C (Clear)	C
CE (Clear entry)	DEL
Close	SHIFT-Q

The calculator supports the basic arithmetic functions: addition, subtraction, multiplication and division. The calculator also supports handling numbers in

scientific notation. To enter very large (or very small) numbers, use scientific notation. Type the mantissa, then E, then the power of 10. For example, to calculate the equation $3.2 \times 10^{11} \times 2.1 \times 10^{-5}$, you would input this sequence on the calculator (using either the pointer or the keyboard:

1. Type: **3.2E11**
2. Click on the **Multiply Key (*)**
3. Type: **2.1E-5**
4. Click on the **Equal Sign (=)**

The correct result, 6,720,000E6 (i.e., 6.72×10^6), is displayed in the calculation window. **Note:** the maximum exponent that may be displayed or used in a calculation is 10^{-37} or 10^{37} (E-37 or E37).

To exit the Calculator, click on the Close button (black key in the upper-right corner of the Calculator's keypad) or press SHIFT-Q on the keyboard.

The Notepad

With the Notepad desk accessory you can jot down short notes while you are using any GEOS application. Your notes will automatically be saved as a Notes file on the disk. Any text that was saved in the Notes file will be displayed each time you use the Notepad. The Notepad is shown below:
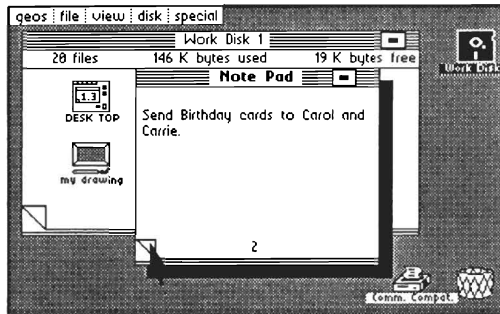
Notepad Desk Accessory

To add notes to the Notepad, type them on the Commodore keyboard. You can start a new line using the RETURN key. Delete characters using the DEL key. To flip to the next page, click on the "dog-eared" page flap at the lower-left corner of the page. The Notepad will store up to 127 pages of notes, with approximately 250 characters on each page. To exit the Notepad, click on the Close button, located in the upper right-hand corner, once.

NOTE: If you wish to delete the *entire* contents of a Notepad, simply delete the Notes file from the deskTop. This will remove all the existing notes and give you a fresh Notepad with which to work. Also, avoid typing on the last line of the Notepad, as this line is sometimes not displayed.

Desk Accessories

The Photo Manager

The **Photo Manager** desk accessory manages graphic images stored in multiple **Photo Albums** on the disk. Each Photo Album may contain up to 127 pages of graphic images collected from your geoPaint documents. Typically, Photo Albums are organized by the type of graphics that they contain. For example, you may have one Photo Album that contains charts and graphs for a business proposal; another album may contain examples of leaf types for a science report.

The Photo Manager desk accessory enables you to select graphics from any of the Photo Albums and use them in other GEOS applications, like geoWrite.

Photo Scraps and Photo Albums
There is a distinct relationship between all of the "photo files." Whenever you cut or copy a picture (graphic image) from an application, the picture is placed into a Photo Scrap file on the disk. Photo Albums are a means of collecting and managing Photo Scraps. The Photo Manager desk accessory allows you to move Photo Scraps to and from a Photo Album.

Collecting an Image
Only the current **Photo Scrap** image can be added to a Photo Album. A Photo Scrap is an actual file (on the disk) used for temporarily storing **one** selected graphic image, or region, at a time. Each time you cut or copy a region into the Photo Scrap, you will replace the *current* contents of that file with the new region.

To create a Photo Scrap, you must be working with a geoPaint document. Click on the Edit Box icon and select a rectangular region (see "Editing Selected Regions: Placing the Selected Region into the Photo Scrap", **Chapter 4**). Select **cut** or **copy** from the **edit** menu. Cut will remove the selected region from the screen and place it into the Photo Scrap; copy will leave the original region on the screen and place a duplicate version of that region into the Photo Scrap. The rectangular area you have selected will be cut or copied into the GEOS Photo Scrap.

Creating a New Photo Album
To save multiple images for use later, you must create a Photo Album in which to place the current Photo Scrap. To create a Photo Album, select **photo manager** from the **geos** menu (you can do this while in an application, or from the deskTop). The Photo Manager will pop up over the screen, and will display a dialog box containing three separate options: Create new Photo Album, Open exisiting Photo Album, and **Quit** (to exit back to the application). Select **Create**.

In the next dialog box which appears, enter the name for the new photo album and press RETURN. The name of the new Photo Album appears in the title bar at the top of the album.

Opening An Existing Photo Album

To view or use an existing Photo Album, select **photo manager** from the **geos** menu. A dialog box will offer three separate options, Create, Open, or Quit. Select **Open**. A second dialog box will appear, listing the Photo Albums found on the disk. If there are more than five Photo Albums on the disk, click on the scroll arrows at the bottom of the dialog box. Each time you click, a new name will scroll into view. Highlight the album you desire by clicking once on its name. Open the album by selecting **Open**.

NOTE: The album name dialog box will only display 15 album names on the disk. If you have more than 15 albums, and wish to display another set of names, you will need to move, delete, or rearrange the file icons on the deskTop (see "File Management" & "Disk Management and Organization", **Chapter 3**).

Quit

Select the Quit option to return you to the current application.

Pasting a Photo Scrap into a Photo Album

To paste a Photo Scrap into a Photo Album, select the **photo manager** desk accessory from the **geos** menu and Create or Open a Photo Album. If the Photo Album contains more than one image, and you wish to place the image in a particular order, click on the dog-eared page flap to advance the page. When you are viewing the page where you would like your image inserted, select **paste** from the **edit** menu. The Photo Manager will transfer the Photo Scrap image to the Photo Album. **Note:** Only a *copy* of the Photo Scrap has been pasted into the Photo Album. If you wish you may use it again in another album.

If you want to open another album, or a new album, select **close** from the **file** menu. This will exit the current Photo Album but still remain in the Photo Manager. A dialog box will appear with the Create, Open or Quit options. Select one and continue.

To quit the current Photo Album and exit the Photo Manager, select **quit** from the **file** menu, or click on the Close icon. The Photo Manager will disappear and you can continue using your application.

The Photo Manager desk accessory is shown below with a sample image pasted into the Photo Album.
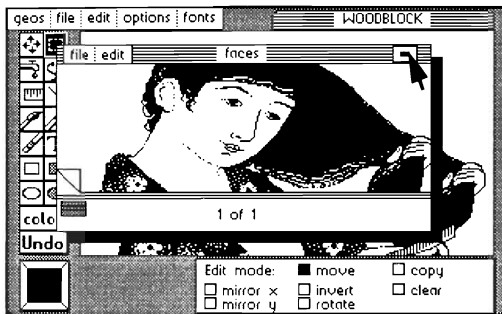
Photo Manager Showing the Photo Album

Viewing Images in a Photo Album

While you are in any GEOS application, including the deskTop, you can run the Photo Manager desk accessory. Open the desired Photo Album and click on the dog-eared corner to page through the images stored in the Photo Album. If an image is larger than the Photo Manager window, you can scroll the window to reveal a different area of the image using the Window Indicator.

The **Window Indicator**, located in the lower-left corner of the Photo Manager, consists of two rectangles. The black rectangle represents the size of the image; the other colored rectangle (the same color as the Pointer) represents the Photo Manager window. The relative position of these two rectangles shows what portion of the image is currently displayed in the Photo Manager window. To move the Photo Manager window, click on where you would like its top-left corner to lie. The Photo Manager window will display the requested area of the image.

Pasting an Image into a Document

To paste an image into a document, first run the appropriate application and open the document. Then select the **photo manager** desk accessory from the **geos** menu. Open a Photo Album, and page through it until your image is visible. Choose **cut** or **copy** from the **edit** menu. The Photo Manager will cut or copy the image into the Photo Scrap. Cut will remove the selected region from the album and place it into the Photo Scrap; copy will leave the original region in the album and place a duplicate version of that region into the Photo Scrap. Follow the specific directions in each application to paste the Photo Scrap into the document. For geoPaint, see "Editing Selected Regions", **Chapter 4;** for geoWrite, see "Using Graphics from geoPaint", **Chapter 5**.

You may also paste the "new" Photo Scrap into another Photo Album. See above, "Pasting a Photo Scrap into a Photo Album".

Desk Accessories

Preference Manager

The **preference mgr** desk accessory allows you to set several different parameters. As shown below, the Preference Accessory is divided into several functional areas.
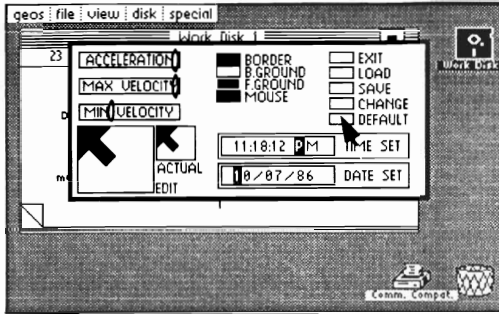
Preference Desk Accessory

By changing the settings displayed in these areas, you can customize the way GEOS works to your own particular preferences.

Setting the Mouse Movement Characteristics
The three bars in the upper-left corner of Preferences allow you to control the speed of the Mouse (Pointer/Cursor). **Minimum** and **maximum velocity** set the minimum and maximum speed the pointer will achieve. **Acceleration** controls how quickly the pointer will achieve the maximum velocity. Simply point to the knob on one of the three control bars and click. Drag it to a new position to change its setting. Moving the knob to the left slows the mouse (Pointer) down; moving to the right speeds up the mouse.

Changing the Mouse Shape and Color
The box in the lower-left corner of Preferences lets you change the actual "bit-mapped" image and color of the GEOS mouse (pointer). Pointing and clicking on the window turns the pixels "on" or "off". You can edit and change the shape of the pointer to whatever you like.

By clicking on the button next to the word "mouse", you can cycle through the available colors for the pointer. You may select any color, except the current Background color.

Changing the Border, Background and Foreground Colors

To change any of the screen colors of the border, background or foreground, simply select **Border, B.Ground or F.Ground** from the options located at the top center of the Preference Manager Accessory. Each click will cycle through the colors available to that section of the screen. For example, the Border can be set to any of the 16 colors at any time. The background color may be any of the 16 colors except the current foreground and mouse colors. This prevents the pointer and text from "blending " into the background and becoming invisible.

Changing the Date or Time

To set the built-in date and time clock, move the pointer into either the **Time Set** or **Date Set** box. Press the SPACE BAR to move the black "highlighting" cursor from digit to digit. Type in any values on the keyboard. (Notice that the time "freezes" after the first press on the keyboard.) When finished, press RETURN to set the date or time.

Moving the pointer outside the Time or Date boxes before pressing RETURN will cause the values to revert to their original settings.

NOTE: Each time you boot GEOS for accurate time/date stamping of your files setting the date and time is recommended.

Using, Saving, and Recalling Your Changes

When you use the Preference Manager to change a GEOS setting, your alteration will not have an effect until you click the **Change** button. At that point, all color changes, mouse/pointer speed, and mouse/pointer graphics will change *within* the preference manager. If you exit the preference manager and return to an application, all of your changes will remain in effect while you *use* the application. However, the default parameters will be *reset* upon quitting the application and returning to the deskTop.

You may wish to make permanent changes in the Preference Manager for particular work disks. For example, on a geoPaint work disk, you may wish to have the Pointer speed set very slow for accurate drawing; on a geoWrite work disk you may wish to set your screen colors to an amber foreground on a black background for easier readability. To save any changes, first select **Change**, then **Save**. The new settings appear as a Preferences file on the disk and are loaded each time you open that disk.

If, after making additional changes to the preferences, you wish to recall your last "saved" changes, click on the **Load** button. This will load the Preferences file into the Preference Manager. The controls will then display the new settings (i.e., color on the buttons will change, speed knobs will move to new positions, new mouse graphics will appear in the edit window). To activate the changes, select **Change**.

Recalling the Default Settings
To recall the built-in default settings, select **Default**. This will load the standard GEOS colors, shapes, and settings.

Leaving the Preference Accessory
To leave the Preference Accessory and return to the application you were running, select **Exit**.

The Text Manager

As the Photo Manager manages graphic images, the **Text Manager** desk accessory manages blocks of text stored in multiple **Text Albums** on the disk. Each Text Album may contain up to 127 pages of text collected from your geoPaint or geoWrite documents. Typically they are organized by the type of text they contain. For example, you may have one Text Album that contains headers and footers for a business proposal; another album may contain poetry samples for an English paper.

The Text Manager desk accessory enables you to select text from any of the Text Albums and use them in other GEOS applications.

Text Scraps and Text Albums

There is a distinct relationship between all of the "text files." Whenever you cut or copy text from an application, the text is placed into a Text Scrap file on the disk. Text Albums are a means of collecting and managing Text Scraps. The Text Manager desk accessory allows you to move Text Scraps to and from a Text Album.

Collecting Text

Only the current **Text Scrap** can be added to a Text Album. A Text Scrap is an actual file (on the disk) used for temporarily storing   one selected text block. Each time you cut or copy text into the Text Scrap, you will replace the *current* contents of that file with the new text.

To create a Text Scrap, you must be working with a geoPaint or a geoWrite document. Select a block of text from an application (see "Adding Text: Placing the Text Region into the Text Scrap", **Chapter 4** and "Editing the Document: Selecting Text to Move Copy or Delete", **Chapter 5**). Select **cut** or **copy** from the **edit** menu. Cut will remove the selected region from the screen and place it into the Text Scrap; copy will leave the original region on the screen and place a duplicate version of that region into the Text Scrap. The text block you have selected will be cut or copied into the GEOS Text Scrap.

Creating A New Text Album

To save multiple blocks of text for use later, you must create a Text Album in which to place the current Text Scrap. To do so, select **text manager** from the **geos** menu (you can do this while in an application, or from the deskTop). The Text Manager will pop up over the screen and display a dialog box containing three

options : Create new Text Album, Open exisiting Text Album, and Quit (to exit back to the application). Click on **Create** once. In the next dialog box that appears, enter the name for the new text album and press RETURN. The name of the new Text Album appears in the title bar at the top of the album.

Opening an Existing Text Album

To view or use an existing Text Album, select **text manager** from the **geos** menu. A dialog box will offer three options, Create, Open, or Quit. Click on Open. A second dialog box will appear, listing the Text Albums found on the disk. If there are more than five Text Albums on the disk, click the scroll arrows at the bottom of the dialog box. Each time you click, a new name will scroll into view. Highlight the album you desire by clicking once on its name. Select Open to open that album.

NOTE: The album name dialog box will only display 15 album names on the disk. If you have more than 15 albums and wish to display another set of names, you will need to move, delete, or rearrange the file icons on the deskTop (see "File Management" and "Disk Management and Organization", **Chapter 3**).

Quit

Selecting Quit will return you to the current application.

Pasting a Text Scrap into a Text Album

To paste a Text Scrap into a Text Album, select the **text manager** desk accessory from the **geos** menu and Create, or Open, a Text Album. If the Text Album contains more than one page, and you wish to place the text in a particular order, click on the dog-eared page flap to advance the page. When you are viewing the page where you would like your text inserted, select **paste** from the **edit** menu. The Text Manager will transfer the text from the Text Scrap into the Text Album.

NOTE: Only a *copy* of the Text Scrap will be pasted into the Text Album. If you like, you may use it again in another album. The text will automatically "word wrap" when it reaches the right edge of the window. You will also notice that there is no font or style displayed for any of the text in the album window. There is no need to worry; the correct font and style information will be displayed when the Text Scrap is pasted into a new document.

If you want to open another album or a new album, select **close** from the **file** menu. This will exit the current Text Album, but you will remain in the Text Manager. A dialog box will appear with the Create, Open, or Quit options. Select one and continue.

To quit the current Text Album and exit the Text Manager, select **quit** from the **file** menu or click on Close. The Text Manager will disappear and you can continue using your application.

The Text Manager desk accessory is shown below with sample text pasted into the Text Album.
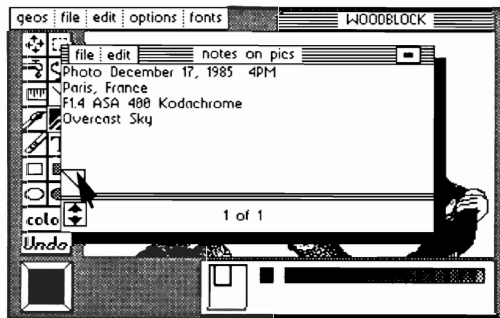
Text Manager Showing the Text Album

Viewing Text in a Text Album

While you are in any GEOS application, including the deskTop, you can run the Text Manager desk accessory. Open the desired Text Album, and click on the dog-eared corner to page through the text stored in the Text Album. If the text is larger than the Text Manager window, you can scroll the window to reveal a different area of the text using the scrolling arrows. A new line of text will come into view each time you click on a scroll arrow.

Pasting Text into a Document

To paste text into a document, select the appropriate application and open the document. Then select the **Text Manager** desk accessory from the **geos** menu. Open a Text Album and page through until the correct text is visible. Select **cut** or **copy** from the **edit** menu. The Text Manager will cut or copy the text into

Desk Accessories

the Text Scrap. **Cut** will remove the selected text from the album and place it into the Text Scrap; **copy** will leave the original text in the album and place a duplicate version of that text into the Text Scrap. Follow the specific directions in each application to paste the Text Scrap into the document. For geoPaint, see "Editing Selected Regions: Pasting the Text Scrap into the Text Region", **Chapter 4**. For geoWrite, see "Using Text from Other Documents: Using the Text Album", **Chapter 5**.

You may also paste the "new" Text Scrap into another Text Album. See the previous section, "Pasting a Text Scrap into a Text Album".

Chapter 7: Troubleshooting

This chapter describes the standard error messages and provides help when you run into difficulty using GEOS.

If Your GEOS Disk Will Not Boot...

First of all, make sure your system is set up as described in "System Requirements for Training Camp" located on page 2-2. Then follow the directions on page 1-4 to boot GEOS. If, when you turn on your computer, you do not see the READY prompt and blinking cursor on the screen, consult your Commodore User's Manual. If after typing LOAD "GEOS",8,1 and pressing RETURN your GEOS disk does not boot, make sure you are using the original System disk, and not a backup or work disk copy.

Standard Error Messages

The error messages listed in this section may result from a number of causes. The problem could be user-related, or a hardware fault, or a GEOS software error. To ensure that the problem is not user-related, this section provides a number of trial solutions to the various error messages you might discover while using GEOS. If the problem persists after following the recommendations in this section, and using alternate hardware does not help, contact Berkeley Softworks for assistance. The following error messages are listed alphabetically.

A maximum of 8 files may be placed on the border.
> The deskTop only allows eight files to be placed in the lower border area below the Disk Notepad. To create room for more, move some of them back onto the Disk Notepad or to another disk.

Bad or missing disk, no sync.
> This error frequently occurs when the disk is not properly inserted into the drive. Check to make sure the disk is inserted label-up, and the disk drive door or latch is closed. Also check the disk drive cables.

Can't copy picture to scrap.
> geoWrite does not allow you to transfer graphics from a geoWrite document to the Photo Scrap.

Can't find printer driver.
> In order to print a document, you must have a copy of the printer driver for your printer on the disk with your document and application.

Cannot go to given page.
> You have entered a page number that does not exist in the document.

Cannot recover from file.
> You have made changes to your document (such as deleting a picture) that have automatically been saved to the file on the disk. You cannot use the **recover** command.

Device not found
GEOS is having trouble communicating with the disk drive. Check to make sure that the drive is on and that the cables are properly connected.

Directory is full
You cannot create a new file because the disk directory cannot hold any more file names. Delete or move some files to another disk to continue.

Disk ID mismatch.
This error means that you have inserted a new disk without letting GEOS know about it. You can only insert or remove disks while at the deskTop and using the open and close commands.

Disk too full.
There is not sufficient free storage space on your disk to perform the requested operation. Delete or move some files to another disk before trying again.

Not enough disk space.
Same as above.

Error reading disk.
GEOS cannot reliably read data from your disk. Repeat the operation you were trying. If this does not help, the disk is probably bad.

File exists, use another.
You are trying to create a document to be saved on the disk, but the name you have specified has already been given to another document on the disk. Choose a different name.

File not found.
GEOS cannot find the file you have requested on the currently opened disk.

Files may not be moved to the border from a non-GEOS disk.
Only disks which have been formatted using GEOS and disks which have been converted to the GEOS directory format can contain files which have been moved from the Disk Notepad to the lower bordered area.

Page too large.
When using geoWrite, it is possible to create a page that requires more memory than is available.

Please move/delete files from disk to continue.
There is not sufficient free storage space on your disk to perform the requested operation. Delete or move some files to another disk before trying again.

Printer is inaccessible.
GEOS cannot communicate with your printer. Make sure you have selected the correct printer driver, and that your interface card and printer are connected properly.

The application that created this file can't be found.
You have tried to open a file which was not created by a GEOS application such as geoPaint or geoWrite.

The operation requested may not be performed on system files.
The requested operation is inappropriate for GEOS system disk file.

This disk not active.
This message is displayed on the deskTop when certain operations are attempted on border files not from the current disk.

This file can't be opened from the deskTop.
Only files of the type BASIC, Assembly, Application, Application Data, or Desk Accessory can be opened on the deskTop.

This file can't be printed from the deskTop.
Only Application data files may be printed from the deskTop.

This file is write protected and cannot be deleted.
Before you can delete a file, you must turn off its write-protect flag. To do so, select the file by clicking on it once. Then select **info** from the **file** menu. Click once in the box next to "Write Protect". Select Close in the top right corner of the dialog box.

This is not a GEOS format disk. Would you like to have it converted?
You are attempting to open a disk which has not been converted to the GEOS directory format. Refer to "Using Non-GEOS Disks" in **Chapter 3** for details.

This operation can only be performed on files from the current disk.
The operation you have requested can only be performed on a file which is on the currently opened disk.

Warning: Disk near full.
You are rapidly running out of storage space on the currently opened disk. Delete or move some files to other disks to free up some space before continuing.

Write protect tab on disk.
You cannot change a disk if the write-protect tab is affixed to it. If you are absolutely sure you want to change the disk, remove the tab from the disk and try again.

Internal Error Messages

Under normal circumstances, you should never see an "internal" error message, a message which begins with an "I". An internal error can only come about in one of two cases: either there is a problem with your disk or hardware, or there is a software error in GEOS. If an internal error persists, even after you have tried alternate hardware, contact Berkeley Softworks for assistance.

Chapter 8: QuantumLink

This section covers QuantumLink, the telecommunications network for Commodore owners. The software needed to access QuantumLink is included on the back side of the GEOS disk. To access QuantumLink, you'll also need a modem (either 300 or 1200 baud).

QuantumLink, also known as Q-Link, is easy to use and affordable. A large selection of services are available to help you make better use of your computer, learn new things, make new friends, save time and money, and have a lot of fun. Services available on the Q-Link network include:
   - Free software (over 2,000 programs are available)
   - Special Interest Groups (SIGs), including a GEOS user group
   - On-line chat and messaging
   - Multiplayer on-line games and tournaments
   - Previews of new software releases
   - Conferences and discussions on a variety of topics
   - The Commodore Hotline (you'll get fast answers from Commodore)
   - Electronic Encyclopedia
   - Discount Shopping and Travel Planning

Take a Guided Tour! (No Modem Required)
You can see for yourself how Q-Link can help you get the most out of your Commodore computer by taking a brief demonstration tour. The tour is stored on your disk, so no modem is required. To take the tour, load the Q-Link side of the disk—if you're using the GEOS desktop, click the Q-Link (under the Special menu bar); otherwise, place the Q-Link side of the disk in your drive and type: LOAD "QDEMO",8,1 (and then press RETURN)

QuantumLink Customer Service:
(800) 392-8200
(Canadians call 703-883-0788)

Q-Link is available from 6 p.m. until 7 a.m. (local time) weekdays and 24 hours weekends and major holidays.

Q-Link Services

Q-Link offers its members dozens of services which are useful, educational and fun. The services are divided into eight Q-Link Departments:

People Connection

People Connection is the social center of the system. This is the place to go to meet other Q-Link members, get help, compete in game tournaments, attend club meetings, or get a front row seat at Auditorium lectures given by experts. People Connection is divided into rooms. A room can be created by any user, and can hold up to 23 people.

Getting Around -- When you first enter People Connection, you will find yourself in a Lobby. If you want to send a message, simply type it and press RETURN -- it will then be broadcast to everyone else in that room. To find out what other rooms are available, press F7 and select "List all occupied public rooms." To move to a different room (or start your own), press F7 and select "Change rooms or enter Box Office."

On-line Games -- Q-Link offers a number of on-line games in PEOPLE CONNECTION. These games, such as Hangman and Sea Strike, can only be played online with another Q-Link member. To find out more about the games, see the instructions which are posted in the JUST FOR FUN department. If you're in PEOPLE CONNECTION and would like to play a game, press F7 and select "Play or observe an on-line game." If needed, Q-Link can even help find you a partner.

News & Information

This department contains the latest headline news and polls where you can express your opinions.

Commodore Software Showcase

The Commodore Software Showcase is where you'll find thousands of useful Commodore programs which you can download to your disk and keep! A wide variety of programs are available, including games, education, utilities, and music. In addition to housing the software libraries, the Commodore Software Showcase also contains other information about software that you will find of interest, including reviews.

Commodore Information Network

The Commodore Information Network (also known as CIN) is designed to aid you, the Commodore user, in getting the information you need and want. It's also the place to get answers to your questions, and exchange helpful suggestions about your Commodore. There's information about new Commodore products, a direct hotline to Commodore, user group information, and Special Interest Groups (SIG) on a variety of topics. If you leave a message on one of the "SIG Message Boards," you can expect to get a fast response from fellow Commodore users across the country!

Learning Center

Thinking of taking some college courses? Need some help with your homework? Want to look something up in a comprehensive electronic encyclopedia that's updated several times a year? The Learning Center can assist you.

Just For Fun

Just for the fun of it...sports contests, trivia quizzes, entertainment news, movie reviews, soap opera summaries, even an "electronic" cafe. Just For Fun is the department to go to for light-hearted entertainment.

The Mall

The Mall helps you save time and money. A wide variety of products are available for your convenience. If you want to save money *and* have fun, be sure to participate in our on-line auctions!

Customer Service Center

This is the place to go if you want to find out what's new on Q-Link, get a calendar of upcoming special events, check the status of your account, create additional user names, or submit your suggestions to Q-Link.

NOTE: Services are subject to change. Q-Link is constantly adding new services, and from time to time we may remove some. To get an up-to-date listing of the available services, go to CUSTOMER SERVICE CENTER and select "Services and Pricing."

Connecting to Q-Link

You will find Q-Link very easy to use. You don't have to memorize any complicated commands or keywords; instead, all you have to do is select options from Q-Link's colorful, easy-to-understand on-line menus.   If you ever have a question or a problem, help is available on-line (we have a team of Q-Guides and Q-Helpers ready to help you) or by phone (our Customer Service department is open every day until 1:00 a.m. Eastern Time).

Getting Started

1. Purchase A Modem
To access Q-Link, you'll need either a 300- or 1200-baud modem. If you don't yet own a modem, see your computer dealer, or call Q-Link Customer Service at 800/392-8200 (Canadians call 703/883-0788).

2. Set Up Your Equipment
• Properly connect your computer, disk drive, monitor, and modem.
• Turn on the power to your computer, disk drive, and monitor.
• Place the Q-Link command template over the function keys (F1, F3, etc.).

3. Load Your Q-Link Disk
You can load the Q-Link software either from the GEOS deskTop, or separately.
Loading from GEOS desTtop:
• Click on the "Special" menu option at the top of the deskTop
• When the menu appears, select **Q-Link**
• When instructed, turn over the disk and click on the **OK** icon.
Loading Separately:
• Insert the Q-Link side of your disk into your disk drive
• When you see READY on your screen, type:
LOAD "*",8,1 (and then press RETURN)

4. Take a Guided Tour
After the Q-Link disk has loaded, you will be asked what you would like to do. You should select **See preview of Q-Link,** which is an off-line demonstration of some of the services and features available on Q-Link. After the brief tour ends, you should then select **Connect to Q-Link**.

5. Enter Your Access Information

You will be asked to enter the following information once, and it will then be stored on your disk:
- type of modem you are using
- type of phone system (touch tone or pulse)
- local access number

To determine your local access number, check the listings at the end of this chapter. When typing in the appropriate number, be sure to include the special symbol (either a "/" or a "+") that precedes the number.

NOTE: If you ever want to change your access information to reflect a different modem or phone number, you can do so by loading a program stored on the Q-Link side of your disk. Type LOAD "CHANGE ACCESS",8,1 (and press RETURN).

6. Connect to Q-Link and Register

After you've entered your access information, select **SIGN ON TO Q-LINK** and press F1. If your equipment is properly connected and you have an auto-dial modem, you will be automatically connected to Q-Link. If you have a manual dial modem, follow the instructions on your screen.

Once you're connected, you will be asked to enter additional information, including:
- the number on the enclosed "Special Introductory Offer" coupon
- your billing information (you can have monthly Q-Link charges billed to a Visa or MasterCard, or your bank will automatically pay your bill from your checking account)
- your name and address, so we can send you our monthly newsletter

7. Welcome Aboard!

After you complete the one-time registration, you'll be ready to explore the system. We recommend that you make PEOPLE CONNECTION your first stop, as you'll find plenty of fellow users ready to chat, play a game, or answer your questions.

IF YOU HAVE ANY PROBLEMS, CALL CUSTOMER SERVICE:

800-392-8200
(Canadians call 703-883-0788)

Follow-Up Visits to Q-Link

The information you entered during your first visit to Q-Link is saved, so you do not need to enter it again.   On subsequent visits, all you need to do is load the Q-Link software, either from the GEOS deskTop or separately.

Loading from GEOS deskTop:
- Click on the **Special** menu option at the top of the deskTop
- When a menu appears, select **Q-Link**
- When instructed, turn over the disk and click on the **OK** icon.

Loading Separately:
- Insert the Q-Link side of your disk into your disk drive
- When you see READY on your screen, type:
    LOAD "*",8,1 (and then press RETURN)

You will then be connected to Q-Link.

NOTE: You cannot make a copy of your Q-Link disk once you have registered it. It will void your account information and you will be unable to use the account again.

How to Disconnect from Q-Link

When you are finished with your on-line session and would like to sign off, return to the Department menu and select **Sign Off**.   Or, turn off the modem to hang up.

Getting Around Q-Link

To get around Q-Link and get the most out of the services, you'll need to familiarize yourself with the four function keys on your Commodore computer, as well as a few other keys and symbols.

Press	Command
Function Keys	
F1	SELECT the menu item with the check mark next to it
F3	SAVE to a disk the information currently being displayed
F5	CANCEL the current screen and return to previous screen
F7	GET a menu, or get help

Other Important Keys

RETURN	SEND a message (or make a game move)
Up/Down Cursor	To move the cursor (√) to a different menu item, or to review additional text, use this key (it's located in the bottom right of the keyboard, next to the Shift key)

- when you press the up/down cursor key *alone*, the cursor will go **down** to a lower menu item or additional text
- when you press the up/down cursor *and* the Shift key at the same time, the cursor will go **up** to a higher menu item or previous text

Special Q-Link Symbols

†††††   FLASHING ARROWS in the lower-right corner of your screen indicate there is more text available, and you should press the up/down cursor key to view it

MAIL   MAIL message in the lower-right corner of your screen indicates you have E-Mail waiting in your electronic mailbox. To read it, press F7 to get a menu, cursor down to "Q-Link Post Office" and select it (by pressing F1), then cursor down to "Read Waiting E-Mail" and select it

+   PLUS (+) sign in the upper-left corner of your screen indicates that you are using one of Q-Link's special "Plus" services.

√   CHECKMARK (√) in the upper right corner of your screen indicates that information is being transmitted from Q-Link to your screen. When the checkmark disappears, the information you requested has been completely transmitted.

Getting Help

If you have problems connecting to Q-Link, or have a question about billing or some other issue, you can call Q-Link's Customer Service Department at:

800/392-8200
Hours: 9 a.m. to 1 a.m. Eastern Time
(Canadians call 703-883-0788)

If you have a question or problem when you are <u>connected</u> to Q-Link, there are four ways to get help:
1. **Press F7**—Dozens of help instructions are stored on your disk. Press F7 for an explanation of how the function you are currently using works.
2. **Ask a Q-GUIDE or Q-HELPER**—You will find members of Q-Link's Customer Service staff available online in the PEOPLE CONNECTION department. Q-GUIDEs are usually available in the Lobbies, and Q-HELPERs are usually waiting to assist you in the room called Help.
3. **Ask a fellow user**—Q-Link is a very friendly network, and you can almost always find someone in PEOPLE CONNECTION who can help you.
4. **Send E-Mail to Jenny C**—If you have a question or comment that doesn't require an immediate answer, you should send E-Mail to Jenny C, a member of the Q-Link staff. She will respond via E-Mail within 48 hours.

Pricing and Billing Information

Q-Link is designed to be the most affordable telecommunications network for Commodore owners. As a Q-Link subscriber, you will have access to a wide range of services for a monthly fee of $9.95.

There are two types of services on Q-Link:

1. **Basic Services** -- Many of the services available on Q-Link are "Basic" services, and you can use BASIC SERVICES AS MUCH AS YOU WANT each month, with no extra charges. Examples of Basic services include the encyclopedia, a news report, information about Commodore computers, and trivia quizzes.

2. **Plus Services** -- Some Q-Link services are special "Plus" services. In addition to unlimited use of Basic services, Q-Link subscribers get their FIRST 60 MINUTES OF PLUS SERVICES FREE EVERY MONTH! Additional Plus service is billed at the rate of 6¢ per minute. (There is no extra charge for 1200-baud access.) Examples of Plus services include People Connection, software downloading, and message boards.

NOTE: Pricing and services are subject to change. For up-to-date information, check the online CUSTOMER SERVICE CENTER department.

Telecommunications Charges
Telecommunications charges are *included* in the Q-Link fees as long as you are able to connect to Q-Link through one of the hundreds of local access numbers listed at the end of this chapter. Q-Link access numbers are available in over 600 cities. If you live in a local calling area, your calls to Q-Link will be handled by your phone company just like any other call. If you live *outside* of the local calling area, you may wish to check with your phone company because you might be billed extra for a long distance call.

Billing Options
Your monthly Q-Link charges can be billed to either a Visa or MasterCard account, or can be paid by your bank from your checking account through a service called CheckFree. With your permission, CheckFree will tell your bank each month what your Q-Link charges are, and your bank will then pay the proper amount from your checking account and list the transaction on your monthly statement.

Monitoring Your Charges

A record of your usage and charges is available on-line. To review your charges, select CUSTOMER SERVICE CENTER from the department menu, and then select **Billing Information.**   If you have any questions about your account, call Customer Service at 800/392-8200. (In Canada call 703-883-0788.)

Q-Link Local Access Numbers

You connect to QuantumLink through local access numbers available in more than 600 cities. When you are initially registering your disk, you will be asked to enter the access number in your area from the list below. Depending on the number you select, you will need to include either a plus (+) symbol or a slash (/) symbol. This symbol should be entered in front of the local number, just as it is listed in this directory (example: /999-9999).

After your modem connects you to the local access number, you will be instantly linked to QuantumLink through a nation-wide data network such as Telenet or Tymnet. The data network costs are *included* in the QuantumLink rates.

As long as the number you select is in your local calling area, it will be handled by your phone company as a local call. If you have flat-rate telephone service, there will be no extra charge; if you have measured-unit service, you will be charged message units, just like you would for any local call.

If your city is not listed, please call QuantumLink Customer Service at 1-800-392-8200. (in Canada call 1-703-448-8700)

ALABAMA		**ARKANSAS**		Canoga Park	+ 306-2984
Anniston	/236-3342	Fayetteville	/442-3850		/789-9002
Bessemer	+ 328-2310	Ft. Smith	+ 782-2852	Cathedral City	/324-0920
Birmingham	+ 328-2310		/782-2486	Chico	/893-1876
	/942-4141	Hot Springs	/321-9741	Colton	+ 824-9000
Dothan	/792-0914	Jonesboro	/935-7957		/370-1200
Florence	/767-7131	Little Rock	/666-6886	Compton	+ 516-1007
	+ 767-7960		+ 372-4616	Concord	/935-0370
Huntsville	/882-3003	Pine Bluff	/535-8055		+ 827-3960
	+ 539-2281	Springdale	/442-3850		/685-6003
Mobile	/343-8414			Corona	/371-2291
	+ 432-1680	**CALIFORNIA**		Covina	+ 330-1630
Montgomery	/265-4570	Alameda	/430-2900		/594-4567
	+ 269-0090	Alhambra	/308-1800	Cupertino	+ 294-9119
Sheffield	+ 767-7960		+ 507-0909	Danville	+ 829-6705
Tuscaloosa	/349-5670	Anaheim	/756-8341	Davis	/758-3551
	+ 345-2077		+ 558-7078	Diamond Bar	/594-4567
		Antioch	/754-8222	El Monte	+ 507-0909
ARIZONA		Arcadia	/308-1800		/308-1800
Mesa	+ 254-0244	Bakersfield	/322-5078	El Segundo	/643-2907
	/254-5811		+ 327-8146	Escondido	/941-6700
Phoenix	+ 254-0244	Belmont	/366-1092		+ 741-7756
	/254-5811	Berkeley	/430-2900	Eureka	/444-0491
Scottsdale	+ 254-0244	Beverly Hills	/789-9002	Fairfield	/257-1990
Tempe	+ 254-0244	Burbank	/846-9235	Fremont	/490-7366
Tucson	+ 747-0107	Burlingame	/952-4757	Fresno	/442-4328
	/790-0764		+ 591-0726		+ 233-0961

Fullerton	+ 558-7078	San Bernadino	+ 824-9000	Denver	+ 337-6060
Garden Grove	+ 898-9820		/370-1200		/830-9210
Glendale	+ 507-0909	San Carlos	+ 591-0726	Ft. Collins	+ 493-9131
	/846-9235	San Clemente	/492-0165		/221-0687
Hayward	+ 881-1382	San Diego	/296-3370	Grand Junction	+ 241-3004
	/430-2900		+ 233-0233	Greeley	/352-0960
Hollywood	+ 624-2251	San Fernando	/789-9002	Lakewood	+ 337-6060
	+ 937-3580	San Francisco	+ 956-5777	Pueblo	/543-3313
Huntington Bch	+ 558-7078		/947-1300		+ 542-4053
Inglewood	+ 624-2251	San Jose	+ 294-9119		
	+ 937-3580		/980-8100	**CONNECTICUT**	
	/587-0030	San Lou. Obispo	/544-5753	Bethany	+ 624-5954
Irvine	/756-8341	San Mateo	+ 591-0726	Bloomfield	/242-7140
Lancaster	/948-4602		/952-4757	Branford	+ 624-5954
Long Beach	/435-0900	San Pedro	+ 548-6141	Bridgeport	/579-1479
Los Altos	/980-8100		/435-0900		+ 335-5055
	+ 856-9995	San Rafael	+ 492-0752	Canton	+ 247-9479
Los Angeles	+ 624-2251		/453-5420	Danbury	/797-9539
	+ 937-3580	San Ramone	+ 829-6705		+ 794-9075
	/587-0030	Santa Ana	+ 558-7078	Fairfield	/454-2701
Long Beach	+ 548-6141		/756-8341		+ 335-5055
Mantea	/985-7843	Santa Barbara	+ 682-5361	Greenwich	+ 348-0787
Mar Vista	/643-2907		/963-8731	Hartford	+ 247-9479
MarinaDelRey	+ 306-2984		/963-9241		/242-7140
	/643-2907	Santa Clara	+ 294-9119	Georgetown	+ 794-9075
Merced	/384-7227		/980-8100	Granby	+ 247-9479
Modesto	/527-0150	Santa Cruz	/475-0981	Manchester	+ 247-9479
	+ 576-2852	Santa Monica	+ 306-2984	Meriden	/634-9249
Monterey	/372-6433		/643-2907	Middletown	/634-9249
	+ 375-2675	Santa Rosa	+ 578-4447	Milford	+ 624-5954
Mt. View	+ 856-9995		/527-6180	New Britain	+ 247-9479
Napa	/257-2656	Sherman Oaks	/789-9002	New Canaan	+ 348-0787
Newport Bch	+ 558-7078	Stockton	/467-0601	New Haven	+ 624-5954
	/756-8341		+ 473-2056		/773-0082
Norwalk	+ 404-2237	Sunnyvale	+ 294-9119	New London	+ 447-8455
	/435-0900		/980-8100		/443-6997
Oakland	+ 836-4911	Thousand Oaks	/496-3473	New Milford	+ 794-9075
	/430-2900	Torrance	+ 548-6141	North Haven	/773-0082
Oceanside	+ 430-0613	Vallejo	+ 552-6656	Norwalk	+ 566-7404
Ontario	/594-4567		/644-1192		/454-2701
Oxnard	+ 656-6760	Van Nuys	/789-9002	Norwich	/444-1709
	/985-7843	Ventura	+ 656-6760	Ridgefield	+ 794-9075
Pacheco	/935-0370		/985-7843	Simsbury	+ 247-9479
Palm Springs	/324-0920	Vernon	/587-0030	Southington	+ 753-4512
Palo Alto	/366-1092	Visalia	/625-5523	Stamford	/965-0000
	+ 856-9995	Vista	/941-6700		+ 348-0787
Pasadena	/308-1800	Walnut Creek	/935-0370	Stratford	/579-1479
	+ 507-0909	W. Covina	/594-4567	Thomaston	+ 753-4512
Pleasanton	/462-8900	W. Los Angeles	+ 789-9002	Trumbull	+ 335-5055
Pleasant Hill	/935-0370	Woodland Hills	+ 887-3160	Wallingford	+ 624-5954
Pomona	/594-4567		/758-3551	Waterbury	+ 753-4512
Rancho Bernar	/485-1990	Woodside	+ 856-9995		/755-5994
Redding	/241-4820			West Hartford	+ 247-9479
Redwood City	+ 591-0726	**COLORADO**		Westport	/454-2701
	/366-1092	Aurora	+ 337-6060	Windsor	+ 247-9479
Riverside	/370-1200		/830-9210		
	+ 824-9000	Boulder	+ 337-6060	**WASHINGTON DC**	
Sacramento	/448-6262		/830-9210	Washington	+ 429-7896
	448-4300	Colorado Spgs	/590-1003		
Salinas	+ 443-4940		+ 635-5361		
	/757-0147	Copper Mtn.	/968-6560		

QuantumLink

DELAWARE

Dover	/678-9545
Newark	/652-2060
Wilmington	/652-2060
	+ 454-7710

FLORIDA

Boca Raton	+ 368-8300
	/272-7900
Bnytn Beach	/471-9310
Clearwater	/796-2166
	+ 323-4026
Cocoa	/639-1405
Daytona Bch	+ 255-2629
	/255-4783
DelRay Beach	/272-7900
Ft. Lauderdale	+ 764-4505
	/463-0882
Ft. Meyers	+ 337-0308
	/481-8866
Fort Pierce	/466-5661
Gainesville	/378-4576
	+ 377-3005
Holly Hill	+ 255-2629
Hollywood	/624-7900
Jacksonville	+ 353-1818
	/721-8100
Lakeland	+ 688-4366
	/665-8582
Longwood	/841-0020
Melbourne	/639-1405
	+ 676-1393
Merritt Isle	/639-1405
Miami	/599-2900
	+ 372-0230
Ocala	/351-0305
	+ 351-3790
Orlando	+ 422-4088
	/841-0020
Panama City	/769-0709
Pensacola	+ 432-1335
	/477-3344
Pompano Bch	/272-7900
	+ 941-5445
St. Petersburg	+ 323-4026
	/796-2166
Sarasota	/365-6980
	+ 923-4563
Tallahassee	/878-2267
	+ 681-1902
Tampa	/932-7070
	+ 224-9920
Vero Beach	/569-8207
W. Palm Beach	+ 833-6691
	/471-9310
Winterhaven	/665-8582

GEORGIA

Albany	+ 883-8600
	/883-2246
Athens	+ 549-4524
	/548-7006
Atlanta	+ 523-0834
	/451-2208
Augusta	+ 724-2752
	/868-8500
Columbus	+ 571-0556
	/327-0597
Doraville	/451-2208
Macon	+ 743-8844
	/746-2739
Marietta	/451-2208
Martinez	/868-8500
Norcross	/451-2208
Rome	/291-1000
Savannah	+ 236-2605
	/232-6751
Warner Robins	/746-2739

IDAHO

Boise	+ 343-0611
	/343-0404
Idaho Falls	/523-7800
Lewiston	+ 743-0099
Pocatello	/233-2501

ILLINOIS

Arlington Hts	+ 938-0500
Aurora	/844-1800
	+ 859-8483
Belleville	/277-9806
Bloomington	+ 827-7000
	/829-2802
Champaign	+ 384-6428
	/359-1163
Chicago	+ 938-0500
	/922-4601
Cicero	+ 938-0500
	/345-9100
Danville	/431-3133
Decatur	/429-5995
	+ 422-0835
Dekalb	+ 758-2623
Downers Grove	/790-4400
East St. Louis	+ 421-4990
Forest Park	/345-9100
Freeport	/232-7111
Glen Ellyn	/790-4400
Joliet	+ 726-0070
	/727-7691
Kankakee	/932-0850
Lake Forest	/362-0820
Lake Zurich	/358-8770

Libertyville	/362-0820
Maywood	/345-9100
Oak Park	+ 938-0500
Palatine	/358-8770
Peoria	+ 637-8570
	/637-5961
Rock Island	/788-3713
Rockford	+ 965-0400
	/398-6090
Skokie	+ 938-0500
Springfield	+ 753-1373
	/525-8025
St. Charles	/844-1800
Urbana	+ 384-6428
	/359-1163
Wheaton	/790-4400

INDIANA

Bloomington	+ 332-1344
	/332-3051
Evansville	+ 424-7693
	/464-8181
Ft. Wayne	+ 426-2268
	/422-2581
Gary	+ 882-8800
	/885-0002
Hammond	/885-0002
Highland	/885-0002
Indianapolis	+ 634-5708
	/631-1002
Kokomo	+ 455-2460
	/456-3871
Lafayette	+ 742-1165
	/423-4544
Marion	/664-9033
Mishawaka	+ 233-7104
	/234-5005
Muncie	+ 289-5068
	/284-7821
Osceola	+ 233-7104
South Bend	+ 233-7104
	/234-5005
Terre Haute	/232-0112
	+ 232-5329

IOWA

Cedar Falls	/236-9020
Cedar Rapids	+ 364-0911
	/363-7514
Council Bluffs	+ 341-7733
Davenport	+ 324-2445
	/788-3713
Des Moines	+ 288-4403
	/277-7752
Dubuque	+ 556-0783
	/582-3599

Iowa City	+ 351-1421	Baltimore	+ 727-6060	Benton Harbor	/925-3134
	/354-7371		/547-8100	Cadillac	/775-6089
Marshalltown	/753-0670	Bethesda	+ 429-7896	Detroit	+ 964-2988
Sioux City	+ 255-1545		/691-8200		/962-2870
	/255-3834	Chevy Chase	/652-0800	Flint	+ 235-8517
Waterloo	/236-9020	Cumberland	/777-9320		/235-5730
	+ 232-5441	Dundalk	+ 727-6060	Freeland	/695-6751
		Frederick	/293-3380	Grand Rapids	+ 774-0966
KANSAS		Hagerstown	/293-3380		/459-2304
Kansas City	+ 221-9900	Myersville	/293-3380	Jackson	+ 782-8111
	/384-1544	Rockville	+ 429-7896		/782-0584
Lawrence	/843-4870		/652-0800		/789-8133
Leavenworth	/651-8094	Silver Spring	+ 429-7896	Kalamazoo	+ 345-3088
Manhattan	/776-0121	Towson	+ 727-6060		/388-2130
Mission	/384-1544			Lansing	+ 484-0062
Salina	/825-1586	**MASSACHUSETTS**			/482-5721
Shawnee	/384-1544	Arlington	+ 292-0662	Manistee	/723-6296
Topeka	+ 233-9880	Attleboro	/226-6441	Marquette	/228-3780
	/234-3070	Boston	+ 292-0662	Midland	+ 832-7068
Wichita	+ 262-5669		/292-1900		/695-6751
	/681-0832	Brockton	+ 580-0721	Muskegon	+ 726-5723
			/584-6873		/739-3453
KENTUCKY		Brookline	+ 292-0662	Plymouth	/451-2400
Bowling Green	+ 782-7941	Cambridge	+ 292-0662	Pontiac	+ 332-5120
	/781-5711		/292-1900	Port Huron	/982-0301
Frankfort	+ 875-4654	Chicopee	+ 781-3811	Saginaw	+ 790-5166
Lexington	+ 233-0312	Fall River	/675-1750		/695-6751
	/266-0019	Fitchburg	/537-6451	Southfield	+ 827-4710
Louisville	+ 589-5580	Framingham	+ 879-6798		/424-8024
	/499-7110		/626-9801	St. Joe	/925-3134
Owensboro	/685-1318	Holyoke	+ 781-3811	Traverse City	+ 946-2121
			/781-6830		/947-0050
LOUISIANA		Lawrence	/689-0186	Warren	+ 575-9152
Alexandria	/445-2694		+ 975-2273		
Baton Rouge	+ 343-0753	Leominster	/537-6451	**MINNESOTA**	
	/924-5102	Lexington	+ 863-1550	Duluth	+ 722-1719
Lafayette	+ 233-0002	Lowell	+ 937-5214		/722-7441
	/237-9500		/459-0694	Mankato	/625-9481
Lake Charles	+ 436-0518	Lynn	/599-0015	Minneapolis	+ 341-2459
	/494-1991	Medford	+ 292-0662		/333-2799
Monroe	+ 387-6330	New Bedford	+ 999-2915	Rochester	+ 282-5917
	/388-8810		/999-4521		/289-5599
New Orleans	+ 524-4094	Newton	+ 292-0662	St. Paul	+ 341-2459
	/522-1370	North Hampton	+ 586-0510		/333-2799
Shreveport	+ 221-5833	Pittsfield	/499-0971	St. Cloud	/252-9093
	/688-5840	Quincy	+ 292-0662		
Slidell	/649-6050	Salem	/599-0015	**MISSISSIPPI**	
		Somerville	+ 292-0662	Gulfport	/868-0109
MAINE		Springfield	+ 781-3811	Jackson	+ 969-0036
Auburn	/786-5390		/781-6830		/355-9741
Augusta	+ 622-3123	Taunton	/824-6692	Meridian	/482-4335
Bangor	/989-2831	Waltham	+ 292-0662	Pascagoula	/769-6673
Brewer	+ 989-3081	Woburn	/935-2057	Vicksburg	/638-1551
	/989-2831	Woods Hole	+ 540-7500		
Lewiston	+ 784-0105	Worcester	+ 755-4740	**MISSOURI**	
	/786-5390		/791-9000	Bridgeton	/731-8002
Portland	+ 761-4000			Columbia	+ 449-7947
	/775-5971	**MICHIGAN**			/874-2771
		Ann Arbor	+ 996-5995	Florissant	+ 421-4990
MARYLAND			/662-8282		
Aberdeen	/273-7100	Battle Creek	+ 968-0929		
Annapolis	+ 224-8550		/965-3901		
	/263-2344				

QuantumLink

Independence	/384-1544	Long Branch	/758-9100	Ronkonkoma	/467-5178
Jefferson City	+ 634-5178	Lyndhurst	/460-0180	Schenectady	+ 465-8444
	/634-8296	Marlton	+ 596-1500		/458-8300
Joplin	/781-8718	Morristown	+ 455-0275	Syracuse	+ 472-5583
Kansas City	+ 221-9990		/539-1222		/437-7111
	/384-1544	New Brunswick	+ 745-2900	Troy	+ 465-8444
Rolla	/364-2084	Newark	+ 623-0469	Utica	+ 797-0920
St. Joseph	+ 279-4797	Park Ridge	/742-0752		/797-7001
	/232-1455	Passaic	+ 778-5600	White Plains	+ 328-9199
St. Louis	+ 421-4990	Patterson	+ 684-7560		/328-7730
	/731-8002		/742-0752		

NORTH CAROLINA

Springfield	+ 864-4814	Pennsauken	/665-5600	Asheville	+ 252-9134
	/869-4903	Piscataway	/562-9700		/252-9023
		Princeton	+ 799-5587	Chapel Hill	/549-8952
MONTANA			/452-1018	Charlotte	+ 332-3131
Billings	+ 245-7649	Rahway	/499-4747		/377-0521
	/252-4880	Red Bank	/758-9100	Davidson	+ 549-8139
Bozeman	/587-1930	Ridgewood	/742-0752	Durham	+ 549-8139
Butte	/782-4202	Trenton	+ 989-8847		/549-8952
Great Falls	/727-9510		/888-0803	Fayetteville	+ 323-8165
Helena	+ 443-0000	Union City	+ 623-0469		/485-8161
Missoula	+ 721-5900		/824-1212	Gastonia	/866-9095
	/721-8960	Vineland	/696-7121	Greensboro	+ 273-2851
		Wayne	/742-0752		/273-0332
NEBRASKA				Greenville	/758-0102
Grand Island	/382-4075	**NEW MEXICO**		High Point	/883-6121
Lincoln	+ 475-4964	Albuquerque	+ 243-4479		+ 899-2253
	/474-7481		/242-8344	Raleigh	+ 549-8139
Omaha	+ 341-7733	Las Cruces	/525-0011		/829-0536
	/393-0903	Santa Fe	+ 473-3403	Research Tr Pk	+ 549-8139
			/984-2941	Rocky Mt.	/977-0617
NEVADA				Wilmington	+ 343-8773
Boulder City	/293-0300	**NEW YORK**			/762-1865
Carson City	/885-8411	Albany	+ 465-8444	Winston Salem	+ 725-2126
Las Vegas	+ 737-6861		/458-8300		/784-6080
	/293-0300	Binghamton	+ 772-6642		
Reno	+ 827-6900		/724-4351	**NORTH DAKOTA**	
	/885-8411	Buffalo	+ 847-1440	Bismark	/255-0869
			/845-6610	Fargo	+ 237-3442
NEW HAMPSHIRE		Corning	/962-4481		/280-0210
Concord	+ 224-1024	Deer Park	+ 667-5566	Grand Forks	/746-0344
Durham	/868-1502	Elmira	/737-9065	Mandan	+ 663-2256
Hanover	/643-4011	Hempstead	+ 292-3800	Minot	/838-1114
Manchester	+ 668-1420		/485-7422		
	/623-0409	Huntington	/420-1221	**OHIO**	
Nashua	+ 889-8618	Ithaca	+ 257-3227	Akron	+ 678-5115
	/882-0435		/257-6601		/535-1861
Portsmouth	+ 431-2302	Melville	/420-1221	Canton	/453-6555
Salem	/893-6200	Mineola	/485-7422		+ 452-0903
		New City	/638-0882	Cincinnati	+ 579-0390
NEW JERSEY		New York	+ 741-8100		/530-9019
Atlantic City	+ 348-0561		+ 741-4950	Cleveland	+ 575-1658
	/345-4050		+ 620-6000		/241-0024
Bayonne	+ 623-0469		/943-4700	Columbus	+ 463-9340
Camden	/665-5600	Niagara Falls	/285-2561		/221-1842
Cherry Hill	/665-5600	Perinton	/385-5817	Dayton	+ 461-5254
Eatontown	/758-9100	Pittsford	/385-5817		/223-3847
Elizabeth	/824-1212	Plattsburgh	+ 562-1890	Elyria	+ 323-5059
Englewood Clif.	/567-9841	Poughkeepsie	+ 473-2240	Euclid	+ 575-1658
Fair Lawn	/567-9841		/473-0401	Hamilton	/894-1521
Jersey City	+ 623-0469	Rochester	+ 454-1020	Kent	+ 678-5115
	/824-1212		/385-5817		

Lima	/228-6343
Mansfield	+ 526-0686
	/526-6067
Marysville	/644-3896
Newark	/349-9234
North Canton	/453-6555
Parma	+ 575-1658
Springfield	+ 324-1520
	/324-3816
Steubenville	/283-2496
Toledo	+ 255-7881
	/255-7790
Warren	+ 394-0047
	/392-2542
Youngstown	+ 743-1296
	/759-8892

OKLAHOMA

Ardmore	/226-1260
Bartlesville	+ 336-3675
Bethany	+ 232-4546
Enid	/234-5320
Lawton	/353-6987
Norman	+ 232-4546
Oklahoma City	+ 232-4546
	/495-8201
Stillwater	+ 624-1112
Tulsa	+ 584-3247
	/582-4433

OREGON

Corvallis	+ 754-9273
Eugene	+ 683-1460
	/746-0092
Medford	+ 779-6343
	/779-2902
Portland	+ 295-3028
	/222-0900
Salem	+ 378-7712
	/585-0182
Springfield	/746-0092

PENNSYLVANIA

Allentown	+ 435-3330
	/865-6978
Altoona	/943-5848
Bethlehem	/865-6978
Butler	/285-9387
	/285-9527
Coatesville	/383-0440
Danville	+ 271-0102
Downington	/383-0440
Erie	+ 899-2241
	/456-8501
Greensburg	/836-4470
Harrisburg	+ 236-6882
	/763-6481
Johnstown	+ 535-7576
King of Prussia	+ 337-4300
	/666-9190
Lancaster	+ 393-2154
	/393-7732

Latrobe	/836-4470
Levittown	/943-3700
Mt. Penn	/779-9580
New Castle	/658-5056
Norristown	/666-9190
Penn Hills	+ 288-9950
Philadelphia	+ 574-9462
	/567-4390
Pittsburgh	+ 288-9950
	/642-6778
Reading	+ 372-7116
	/779-9580
Scranton	+ 961-5321
	/346-4516
State College	+ 231-1510
	/234-3853
Upper Darby	+ 574-9462
Valley Forge	/666-9190
Wilkes Barre	+ 829-3108
	/826-8991
Williamsport	+ 494-1796
York	+ 846-6550
	/848-9850

RHODE ISLAND

Middletown	/849-1660
Newport	/849-1660
Pawtucket	/273-0200
Providence	+ 751-7912
	/273-0200
Warwick	+ 751-7912
	/273-0200
Woonsocket	/765-5994

SOUTH CAROLINA

Charleston	+ 722-4303
	/556-1040
Columbia	+ 254-0695
	/254-7563
Greenville	+ 233-3486
	/271-9213
Spartanburg	+ 585-1637
	/585-0016

SOUTH DAKOTA

Pierre	+ 224-0481
Rapid City	+ 348-2621
	/341-4007
Sioux Falls	+ 336-8593
	/335-0780

TENNESSEE

Bristol	+ 968-1130
Chattanooga	+ 756-1161
	/265-1020
Clarkesville	/552-0193
Jackson	/424-2114
Johnson City	+ 282-6645
	/928-1191
Knoxville	+ 523-5500
	/690-1543
Memphis	+ 521-0215
	/527-8006

Nashville	+ 244-3702
	/885-3530
Oakridge	/482-9080

TEXAS

Abilene	+ 676-9151
	/672-1363
Amarillo	+ 373-0458
	/371-0031
Arlington	/877-3630
Austin	+ 928-1130
	/444-3280
Baytown	/420-3389
Brownsville	/548-1331
Bryan	+ 779-0173
	/823-1090
College Station	/823-1090
Corpus Christi	+ 884-9030
	/883-8050
Dallas	+ 748-6371
	/638-8888
Denton	/565-0552
El Paso	+ 532-7907
	/533-1453
Fort Worth	+ 332-4307
	/877-3630
Galveston	+ 762-4382
	/765-7338
Houston	+ 227-1018
	/556-6700
Killeen	/634-3439
Lackland	+ 225-8004
Laredo	+ 724-1791
	/727-4626
Longview	+ 236-4205
	/236-4271
Lubbock	+ 747-4121
	/797-0765
Mcallen	/631-6101
Midland	+ 561-9811
	/561-8401
Nederland	+ 722-3720
	/722-4166
Odessa	+ 561-9811
	/561-8401
Port Arthur	/722-4166
San Angelo	+ 944-7621
	/658-6697
San Antonio	+ 225-8004
	/225-8002
Sherman	/893-1024
Temple	+ 773-9423
Terminal	+ 561-9811
Texas City	/765-7338
Tyler	+ 592-3927
	/597-9321
Waco	+ 752-9743
	/753-0001
Wichita Falls	/723-2386

QuantumLink

UTAH			Springfield	+ 429-7896	Brookfield	/785-1614
Ogden	+ 627-1630		Vienna	+ 429-7896	Eau Claire	+ 836-9295
	/621-1280		Virginia Beach	+ 625-1186		/832-1354
Provo	+ 373 0542			/855-7751	Green Bay	+ 432-2815
	/375-0645		Williamsburg	/872-9592		/432-3064
Salt Lake City	+ 359-0149				Janesville	/362-4655
	/364-0780		**WASHINGTON**		Kenosha	/553-9044
			Auburn	+ 939-9982	La Crosse	/784-9099
VERMONT				/735-3975	Madison	+ 257-5010
Barre	/229-4508		Bellevue	+ 625-9612	Milwaukee	+ 271-3914
Burlington	+ 864-0808			/285-0109		/785-1614
	/864-5714		Bellingham	+ 733-2720	Neenah	+ 722-7636
Montpelier	+ 229-4966			/671-5990		/722-5580
	/229-4508		Enumclaw	/735-3975	Oshkosh	/235-7473
Rutland	+ 775-1676		Everett	/258-1018	Racine	+ 552-7217
White River	+ 295-7631		Longview	+ 577-5835		/553-9044
			Olympia	+ 754-0460	Sheboygan	+ 452-3995
VIRGINIA				/943-9050		/452-2622
Alexandria	+ 429-7896		Richland	+ 375-5377	Wausau	/355-1262
	/691-8200			/375-3367	West Bend	/334-1240
Annandale	+ 429-7896		Seattle	+ 624-9612		
Arlington	/691-8200			/285-1019	**WYOMING**	
Charlottesville	+ 971-4082		Spokane	+ 455-4071	Casper	+ 265-5167
	/293-4915			/624-1549		/234-4211
Chesapeake	+ 625-1186		Tacoma	+ 627-1791	Cheyenne	+ 638-4421
Fairfax	+ 429-7896			/272-1503		/632-7464
	/691-8200		Vancouver	/693-0371	Laramite	+ 721-5878
Falls Church	+ 429-7896		Wenatchee	+ 663-6227		
Hampton	/596-7608		Yakima	/248-1462		
Harrisonburg	+ 434-7121					
Herndon	+ 435-1800		**WEST VIRGINIA**			
Lynchburg	/528-1903		Charleston	+ 345-6471		
Midlothian	/744-4860			/345-9575		
Newport News	+ 596-6600		Huntington	+ 523-2802		
	/596-7608			/523-8432		
Norfolk	+ 625-1186		Morgantown	+ 292-0104		
	/855-7751			/292-0682		
Petersburg	/861-1788		Parkersburg	/428-8511		
Portsmouth	+ 625-1186		Westover	/292-0682		
	/855-7751		Wheeling	/233-7950		
Richmond	+ 788-9902					
	/744-4860		**WISCONSIN**			
Roanoke	+ 344-2036		Appleton	/722 5580		
	/344-2762		Beloit	/365-6883		

Canadian Tymnet Access Numbers

There is a 6¢/minute (U.S.) communications surcharge to connect to QuantumLink through Tymnet.

When entering your local access number, you must enter the slash symbol (/) *before* entering the number, as a "/" symbol informs the Q-Link access software to use the Tymnet sign-on procedure.

If you have any questions or problems, you can call Q-Link Customer Service at 1-703-883-0788.

Montreal	/514/748-1051	Ottawa	/613/563-7706	Calgary	/403/232-6661
Vancouver	/604/294-3223	Toronto	/416/365-7630		

Canadian Datapac Access Numbers

There is a 15¢/(U.S.)/minute ($9.00/hour) communications surcharge to connect to QuantumLink through Datapac.

When entering your local access number, you must enter the exclamation symbol (!) *before* entering the number, as a "!" symbol informs the Q-Link access software to use the Datapac sign-on procedure.

If you have any questions or problems, you can call Q-Link Customer Service at 1-703-883-0788.

	300 BAUD	1200 BAUD
Alberta		
Calgary	!264-9340	!290-0213
Edmonton	!420-0185	!423-4463
Fort McMurray	!791-2884	!743-5207
Grande Prairie	!539-0100	!539-6434
Lethbridge	!329-8755	!327-2004
Medicine Hat	!526-6587	!529-5521
Red Deer	!343-7200	!342-2208
British Columbia		
Kamloops	!374-5941	!374-9510
Kelowna	!860-0331	!860-9762
Nanaimo	!753-6491	!754-8291
Nelson	!354-4411	!354-4824
Prince George	!564-4060	!562-8469
Terrace	!635-7221	!638-0238
Vancouver	!689-8601	!687-7144
Victoria	!388-9300	!386-0900
Manitoba		
Brandon	!725-0878	!727-6609
Dauphin	!638-9244	!638-9441
Morden	!822-6237	!822-6287
Portg La Prair.	!239-1166	!239-1688
Selkirk	!785-8625	!785-8771
Steinbach	!326-9826	!326-1385
Thompson	!778-6461	!778-6451
Winnipeg	!475-2740	!943-4488
New Brunswick		
Bathurst	!548-4461	!548-4581
Campbellton	!759-8561	!759-8571
Edmundston	!739-6621	!739-6611
Fredericton	!454-9462	!454-4525
Moncton	!854-7078	!854-7510
Newcastle	!622-4451	!622-8471
Saint John	!693-7399	!642-2231
Woodstock	!328-9361	!328-9351
Newfoundland		
St. John's	!726-4920	!726-5501
Nova Scotia		
Bridgewater	!543-6850	!543-1360
Amherst	!667-5035	!667-5297
Halifax	!477-2000	!477-8000
Kentville	!678-1030	!678-2096
New Glasgow	!752-0944	!752-1731
Sydney	!539-7010	!539-8040
Truro	!662-3258	!662-3773
Ontario		
Barrie	!737-4100	!737-4120

	300 BAUD	1200 BAUD
Belleville	!966-6002	!966-9301
Brampton	!791-8900	!791-8950
Brantford	!756-0000	!756-0020
Brockville	!345-0520	!345-3780
Chalk River	!589-2175	!589-2117
Chatham	!354-7710	!354-7716
Clarkson	!823-6000	NA
Cornwall	!938-9700	!938-4777
Galt	!622-1714	!622-1780
Guelph	NA	!836-7960
Hamilton	!523-6800	!523-6900
Kingston	!549-7720	!549-7760
Kitchener-Wat.	!579-0009	!579-0310
London	!679-7500	!679-7620
Niagara Falls	!357-2702	!357-2770
North Bay	!476-3900	!476-3920
Oshawa	!579-8920	!579-8950
Ottawa	!567-9100	!567-9300
Peterborough	!748-6940	!748-6945
St. Catharines	!688-5620	!688-5640
Sarnia	!336-9920	!336-0950
Sault Ste. Mar.	!942-4960	!942-4970
Sudbury	!673-9602	!673-9652
Thunder Bay	!623-9644	!623-3270
Toronto	!868-4000	!868-4100
Windsor	!973-1000	!973-1020
Woodstock	!485-5220	!485-5236
Prince Edward Island		
Charlottetown	!566-5002	!566-5934
Quebec		
Drummondville	!477-7151	!477-7153
Granby	!375-1240	!375-4184
Joliette	!759-8340	!759-8381
Jonquiere/Chic	!545-2272	!545-2290
Montreal	!878-0450	!878-0640
Quebec City	!647-4690	!647-2691
St. Hyacinthe	!744-9270	!774-9991
St. Jean	!346-8779	!347-6211
St. Jerome	!432-3453	!432-3165
Sherbrooke	!566-2770	!566-2990
Sorel	!743-3381	!743-0101
Trois Rivieres	!373-2600	!373-2603
Valleyfield	!377-1260	!377-1680
Saskatchewan		
Moose Jaw	!693-7611	!374-5910
Prince Albert	!922-4233	!922-4234
Regina	!565-0111	!565-0181
Saskatoon	!665-6660	!665-7758
Swift Current	!778-3941	!778-3951

QuantumLink

Index

Registration Card

Please complete this card to register for product support and new product information.

Name _____

Address _____

City _____ State_____ Zip _____

Phone ( ) _____

Place of Purchase _____ Date _____

Purchaser's age?

☐ under 18   ☐ 18-24   ☐ 25-34   ☐ 35-49   ☐ over 50

Purchaser's sex?

☐ male   ☐ female

Primary user's age?   (if other than yourself)

☐ under 18   ☐ 18-24   ☐ 25-34   ☐ 35-49   ☐ over 50

Primary user's sex?   (if other than yourself)

☐ male   ☐ female

What system do you own?

☐ C 64   ☐ C 128

What is the primary use for your computer?

☐ Business   ☐ Home applications   ☐ Programming

☐ Education   ☐ Entertainment   ☐ Graphics

Rank, in order of preferrence, GEOS applications you would like to purchase. (#1 would be your most favorite.)

____ Word processing ____Spreadsheet ____Database

____Telecommunications ____ Educational ____ Utilities

Other _____

Which magazines do you read?

☐ Commodore Microcomputers   ☐ Compute!

☐ Commodore Power/Play   ☐ Family Computing

☐ Compute!'s Gazette ☐ Run ☐ Ahoy ☐ BYTE

What type of peripherals do you own?

Disk Drive _____

Printer _____

Input device (joystick, lightpen, etc.) _____

BERKELEY SOFTWORKS
2150 Shattuck Avenue
Berkeley, CA   94704