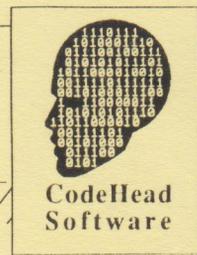


# G+plus



**G+PLUS**

**USERS' MANUAL**

version 1.2

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## Introduction

Before we go any further, CodeHead Software would like to thank you for purchasing our product!

G+PLUS is a powerful and complete replacement for Atari GDOS. You can use G+PLUS with any program that supports Atari GDOS; all functions will work in exactly the same way. But G+PLUS also adds some special capabilities unavailable under Atari GDOS, such as the ability to re-load an ASSIGN.SYS file (which contains the list of fonts and device drivers that G+PLUS will use) any time you run a program. In addition, G+PLUS will free you from the dreaded "GDOS slowdown" effect that many users notice; G+PLUS will cause no perceptible slowdowns in any graphics operations.

G+PLUS is a program that runs from an AUTO folder, just like GDOS. The extended capabilities mentioned above are available when you use the G+PLUS Accessory along with G+PLUS.PRG. If you're tight on memory, you can choose not to install the G+PLUS Accessory; G+PLUS itself will still work although some features will be unavailable.

(By the way, G+PLUS is pronounced "GEE PLUS.")

# Installing G+PLUS

## Included Files

The following files are included on the G+PLUS master disk:

|              |  |
|--------------|--|
| AUTO         | a sample AUTO folder, containing G+PLUS.PRG  |
| G+PLUS.PRG   | the program, duplicated in the AUTO folder   |
| G+PLUS.ACC   | the accessory  |
| ReadMe       | read this first -- it may contain important information which couldn't be included in this manual.       |
| GDOS_INF.DOC | "Everything You Wanted to Know About GDOS", a text file by Douglas N. Wheeler, included with permission. |
| ZoomTest.PRG | a test program to demonstrate zoom box speed   |

## Before Anything Else

The first thing you should do upon opening your G+PLUS package is make a copy of the master disk. This way, if anything should happen to the master you'll have a backup copy. The G+PLUS master disk is not copy-protected because we believe you have the right to protect yourself against disk failures. Please respect our rights too, and don't give away or sell copies of G+PLUS.

## Replacing GDOS

If you've been using a GDOS program such as MICROSOFT WRITE, EASY DRAW, WORDUP, or TIMEWORKS PUBLISHER (just to name a few), chances are that you already have a boot disk set up with GDOS.PRG in a folder called AUTO. If this is the case, simply copy G+PLUS.PRG from the G+PLUS master disk to the AUTO folder of your boot disk, and rename GDOS.PRG to something like GDOS.PRX; changing the GDOS suffix from .PRG to PRX will prevent it from loading. (If you're unsure how to copy or rename files, consult the manual that came with your ST.) You may choose to delete GDOS.PRG from your AUTO folder for, as a G+PLUS owner, you'll probably never use it again (don't delete your only copy of it). If you don't already have an AUTO folder with GDOS in it, you should create an AUTO folder on your boot disk (either floppy or hard) and copy G+PLUS.PRG into it. Now when you boot up, G+PLUS will be installed in place of GDOS.

## Installing the G+PLUS Accessory

The ST GEM desktop supports up to six desk accessories. When you turn on your computer, or press the reset button, or change resolutions the system looks in the root directory of the boot drive for programs with names ending in '.ACC', and installs them so that they appear in the drop-down menu titled 'Desk'.

To install the G+PLUS Accessory, copy the file 'G+PLUS.ACC' to the root directory of your boot disk (or hard disk partition). It will appear in your Desk drop-down menu, but only after you reboot the system. Do this by

pressing the reset switch or turning the power to the ST off and then on. Remember that every time you press the reset switch or turn the power off/on, the accessories will disappear and be reloaded from the disk in your boot drive. If you have a different disk in your boot drive, different accessories (or no accessories) will be loaded, according to what is contained on *that* disk. This is a common area of confusion to beginning ST users. If you don't understand this process, refer to your ST owner's manual.

## Using G+PLUS

For the most part, the operation of G+PLUS.PRG (the one that goes in your AUTO folder) is transparent to the user. In other words, you should never have to bother with it once you've copied it into your AUTO folder.

One big difference between G+PLUS and Atari GDOS is that G+PLUS does *not* require you to have an ASSIGN.SYS file in your root directory when you boot up. If GDOS is unable to find an ASSIGN.SYS file at bootup time, it simply exits without installing itself. If G+PLUS can't find ASSIGN.SYS it will remain active; you can then load an ASSIGN file by holding the Alternate key when you run a program, or use the "Installation File" feature to automatically load your ASSIGN files.

If G+PLUS doesn't find ASSIGN.SYS at bootup time, it will install a set of "default devices". These devices are just what is necessary to allow G+PLUS to remain resident....it's unlikely that you'll be able to run a program that expects to find certain fonts and device drivers without first loading its associated ASSIGN file. Programs will most likely inform you of an error in this case, and immediately exit.

## Using ASSIGN Files with G+PLUS

G+PLUS will read any ASSIGN.SYS file created for use with GDOS, without problems. To make it even easier for you to use ASSIGN files, G+PLUS lets you imbed a title in the file which will be shown both at bootup time and in the G+PLUS Accessory. You can use this "magic word" feature to give titles to your ASSIGN files, or to display notes about their use. An ASSIGN.SYS file is an ASCII text file and you can use a word processor or text editor to make changes to it. If you use a word processor, make sure that you save your edited file without formatting, that is "as ASCII". To add the "magic word" to your ASSIGN files, simply enter the letters "G+PLUS:" (notice the colon after G+PLUS) after the semi-colon in a comment. (Any text following a semi-colon in an ASSIGN file is considered a "comment.") After the magic word, on the same line, you can enter up to 24 characters for your title. Some examples:

```
; G+PLUS: Easy Draw Fonts
```

```
; G+PLUS: Timeworks Publisher II
```

```
; G+PLUS: Broadway/Kolossal
```

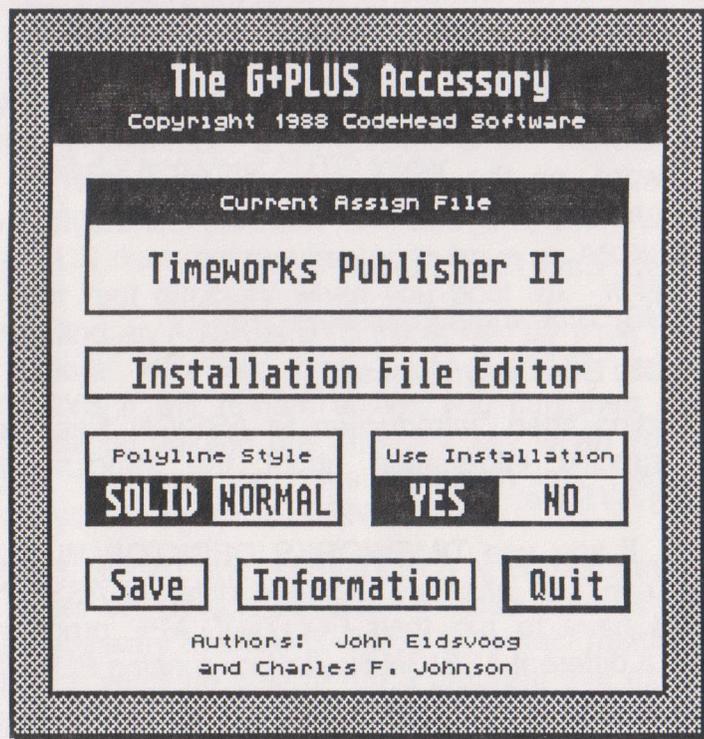
The section titled "Introduction to ASSIGN files" contains more specific information about the structure of the ASSIGN.SYS file.

NOTE: If you use TIMEWORKS DESKTOP PUBLISHER and you wish to alternate between different ASSIGN files, you will have to run their FONTWID.APP program after loading a different ASSIGN file, before running PUBLISHER. This need only be done after changing your ASSIGN file for PUBLISHER, not every time G+PLUS loads a different ASSIGN file.

## Using the G+PLUS Accessory

If you followed the instructions on installing the G+PLUS program and accessory, you should be ready to go. Move the mouse up to the title "Desk" in the upper left corner of your screen and select the G+PLUS Accessory (click the left button while pointing at "G+PLUS Accessory"). If you are unable to do this, go back and follow the instructions on "Installing the G+PLUS Accessory."

A dialog box will appear showing the options available:



## Loading a New ASSIGN File

There are two different ways to load a new ASSIGN file and activate all of its font and device driver assignments. The "Installation File" method (described below) allows you to automatically load ASSIGN files when you run a specified program. You can also load ASSIGN files manually by using the "Alternate Options" feature.

### Alternate Options

To access the Alternate Options menu, hold down the Alternate key as you double-click on a program to run it. A dialog box will appear before the program actually runs, with three buttons labeled "Load ASSIGN File," "Bypass Installation," and "Continue."

When you click on the "Load ASSIGN File" button a file selector will appear, showing all files with an extension of SYS. Locate the ASSIGN file and click on it, then click on the file selector's OK button. The G+PLUS Accessory will now attempt to load the file you chose, and install it with G+PLUS so that the program you're running will use your desired fonts and device drivers. If an error occurs during the loading process you'll see an error message and be given the option to try again, abort back to the desktop, or run the program anyway.

"Bypass Installation" is a quick way to defeat the Installation File feature, without accessing the G+PLUS Accessory from the "Desk" drop-down menu. If you click on "Bypass Installation" the program you're running will use whatever ASSIGN file is currently in memory, bypassing the check for the Installation File entirely.

The "Continue" button lets you continue running the program you selected, if you've changed your mind about using Alternate Options.

After loading an ASSIGN file, its name will be shown in the box labeled "Current ASSIGN File" in the G+PLUS Accessory, so you can tell at a glance which file is active. We suggest giving your ASSIGN files names like EASYDRAW.SYS, PUBLISH2.SYS, WORDUP.SYS, etc. to help you remember which program the file is intended to be used with. (Note: if a "magic word" is present in the ASSIGN file, any text following the magic word will appear in the box instead of the filename. See the section titled "Using ASSIGN Files with G+PLUS" for more details about the "magic word" feature.)

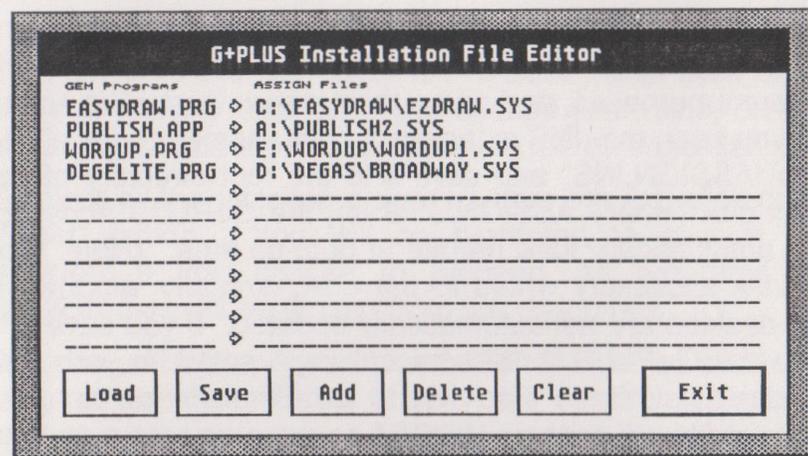
### The Installation File

The "Alternate Options" menu lets you load an ASSIGN file manually. G+PLUS also has a powerful feature called the "Installation File" which can *automate* this process, making it extremely simple to switch back and forth among different programs that use G+PLUS. The Installation File contains the names of the programs you're likely to use and the pathnames of their corresponding ASSIGN files, so that when you run a program its fonts and device drivers can be loaded automatically.

When you have an Installation File active, you don't have to worry about a thing when you run different programs that use G+PLUS. The G+PLUS Desk Accessory automatically loads the correct ASSIGN file for each program. You just double-click on the program you want to use, when you want to use it...what could be simpler?

### The Installation File Editor

To create or edit an Installation File, click on the button labeled "Installation File Editor" in the G+PLUS Accessory. You'll see the following dialog box appear:



The box contains space for a maximum of 12 installation strings, arranged in two columns. The program's name will be shown in the left column, and its associated ASSIGN file in the right column. The current Installation File will always be shown in this box. The first time you use the G+PLUS Accessory all 12 strings will be filled with underline characters, indicating that there is no installation data in memory.

All functions of the Installation File Editor are accessed via the six buttons at the bottom of the box, labeled "Load," "Save," "Add," "Delete," "Clear," and "Exit."

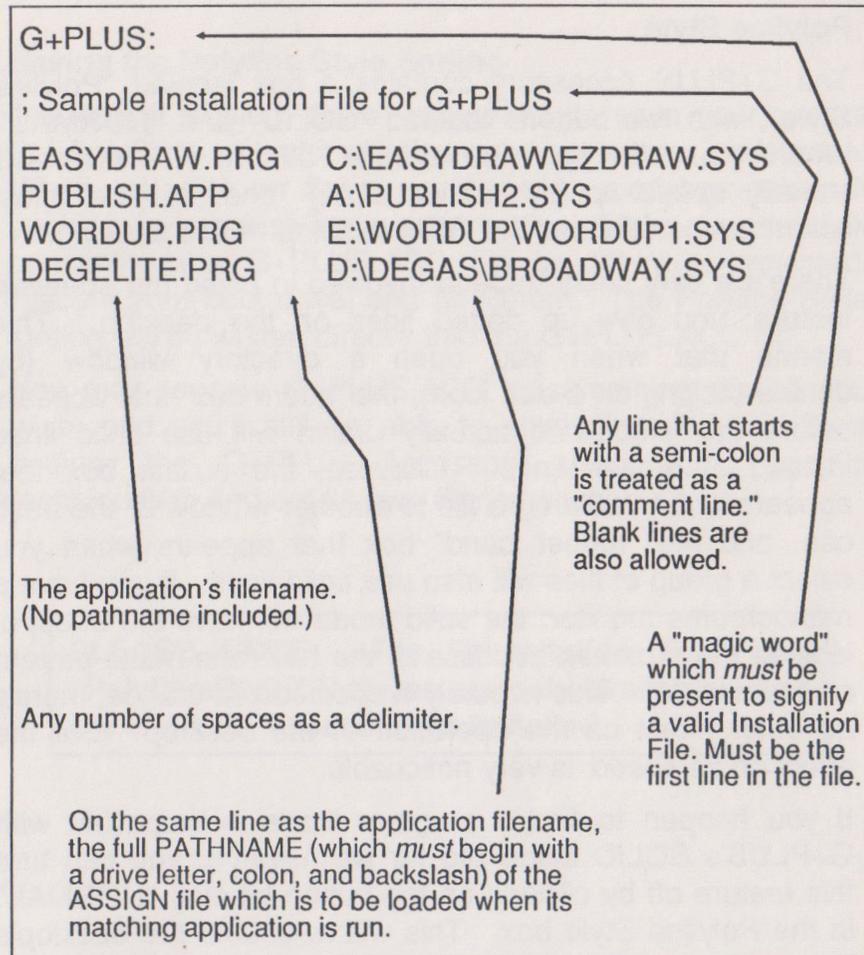
Click on the "Load" button to load an Installation File. (Of course, you must have previously saved one.) A file

## Disabling the Installation File

There may be times when you don't want an Installation File active. Perhaps you're trying to test out a new ASSIGN file, or maybe you want to deliberately use an ASSIGN file from a different program. To disable the Installation File feature, click on the button labeled "NO" in the "Use ASSIGN.INS" box. The Installation File can be re-enabled by clicking on the "YES" button.

As mentioned in "Alternate Options," you may also bypass the Installation File feature when you run a program by holding the Alternate key and selecting "Bypass Installation" from the dialog box that appears.

Figure One shows the format of a G+PLUS Installation File.



A G+PLUS Installation File is saved as an ordinary ASCII text file. You may show or print this file from the desktop by double-clicking it, and you may use a word processor or text editor to modify it.

Figure One.

## Polyline Style

The G+PLUS Accessory contains a box labeled "Polyline Style", with two buttons labeled "SOLID" and "NORMAL". When you click on the SOLID button, G+PLUS will actually *speed up* (by about 25%) one of the most common operations of the GEM desktop --- line drawing.

There's a very small tradeoff involved in using the speedup feature; you give up dotted lines on the desktop. This means that when you open a directory window (by double-clicking on a disk icon), the "zoom box" that appears before the window is actually drawn will use solid lines instead of broken lines. Likewise, the outline box that appears when you drag a file to another window or the trash can, and the "rubber band" box that appears when you select a group of files will also use solid lines. If you have a monochrome monitor, the solid mode will have the effect of looking more broken because of the half-tone matte pattern on the desktop. This is purely a cosmetic difference; there's no other effect on the operation of the desktop. But the effect on its *speed* is very noticeable.

If you happen to find a program that's incompatible with G+PLUS's SOLID mode (so far we haven't), you can turn this feature off by clicking on the button labeled "NORMAL" in the Polyline Style box. This will re-enable the desktop's dotted lines. Programs like DEGAS ELITE and EASY DRAW can still use any line styles (including dotted) in their drawing operations while the "SOLID" button is selected--only the desktop's lines (zoom boxes, windows, etc.) will be "frozen" solid.

## Saving the Polyline Style Setting

The button labeled "Save" allows you to save your current Polyline Style so that it will always be set to your preference. When you click on Save, you'll see an alert box asking if you're sure you wish to save the setting. Make sure the disk containing the G+PLUS.ACC file is not write-protected. Place it your boot drive, and hit Return. The Polyline Style setting will be written directly into the G+PLUS.ACC file.

You may rename G+PLUS.ACC to something else if you wish, and you'll still be able to save your Polyline Style setting; the G+PLUS Accessory uses some special techniques to find out its own filename when it runs.

**PLEASE NOTE: The "Installation File" and "Polyline Style" features are only available when the G+PLUS Accessory is installed.**

## What is GDOS?

GDOS is an acronym for Graphics Device Operating System. It is an extension of the ST's TOS operating system which adds the ability to load disk-based fonts and "device drivers". The fonts used by GDOS can be fully proportional, with multiple point sizes -- although a separate font file will be needed for each point size. The purpose of "device drivers" is to allow programs to use the same commands to send output to any conceivable device that could be connected to the ST, such as plotters, dot-matrix and laser printers, high resolution display screens, etc. Device drivers make a programmer's life much easier; there's no need to write special code for each and every device, it's only necessary that the correct driver be installed.

On the IBM PC, GDOS is an integral part of the GEM operating system. However, for some reason GDOS was not built into the ST version of GEM. (Perhaps it wasn't fully functioning and de-bugged?) As a result, on ST computers GDOS must be "patched" into the operating system at bootup time by running it from an AUTO folder. GDOS cannot be purchased by the public; the current version (RELEASE 1.1, as of this writing) is licensed by Atari to developers for inclusion with commercial programs.

Many people have misconceptions about what GDOS is and what it does. Here are a few facts about GDOS:

- GDOS' main purpose is to load fonts and device drivers, and make sure a program's graphics commands get to the right devices.
- GDOS itself is *not* a "memory hog." The amount of memory it uses is dependent on the number of fonts and drivers you wish to have installed.
- GDOS does not load fonts at bootup time, nor do fonts remain resident in memory. Fonts are loaded when you run a program that uses them, and they are "unloaded" when the program exits.
- GDOS does not talk directly to your printer or any other device. It simply passes the commands to the appropriate device driver.

When GDOS runs at bootup time it reads a text file called ASSIGN.SYS, which contains a list of available device drivers and the font files associated with each device. (That's right, each device will have its own set of fonts.) Fonts are *not* loaded at this time, only the list of available fonts is stored in memory. Device drivers are *not* loaded at this time unless specified (see 'ASSIGN files').

At this point, GDOS remains dormant (except for a noticeable slowdown) until an program opens a workstation for a device listed in the ASSIGN file. The driver for that device is then loaded (if it is not already in RAM or ROM) using the pathname specified in the ASSIGN file. A device driver is simply a specialized type of program which takes the graphics commands sent to it by GDOS, translates them into the appropriate commands for a particular device (e.g. a

printer or plotter), and then passes them on to the device. This is one of the nicest features of the GDOS scheme...a program can use the same graphics commands to access just about any type of output device. A more detailed description of how device drivers work can be found in the section "Introduction to ASSIGN Files".

After opening a workstation for a device, the fonts associated with that device may be loaded. Unfortunately, under the present system the program has no control over which fonts can be loaded; it's an all-or-nothing proposition. When the program tells GDOS to load the fonts listed in the ASSIGN.SYS file (with a VDI call), GDOS looks in the path specified in ASSIGN.SYS for the font files and attempts to load every font that is 'ASSIGN'ed to that device. If you run out of memory before reaching the end of the font list, loading is simply stopped.

This method assumes that the fonts can be found (is the correct floppy in the drive, or fonts in the right hard disk partition?), that there is enough memory available, that you remembered to boot up with the correct ASSIGN.SYS file, and that the maximum number of fonts allowed by the program is greater than or equal to the number of fonts assigned to that device. Remember that the ASSIGN.SYS file can be altered by the user, so there is no way that the program can know for sure that all of this is possible.

## WHAT IS G+PLUS?

The very existence of G+PLUS is based on the fact that GDOS slows down the operation of your computer. Even when your computer is apparently sitting idle, it's performing thousands of operations every second....and when you actually *do* something, like move the mouse or type a key, things *really* get going.

GDOS works by intercepting a large percentage of these system operations (known as "VDI calls") and making sure they get to the proper devices. This added overhead to the system bogs down many of the most common things you do with your ST, such as moving the mouse cursor through the drop-down menus, or dragging a file across the desktop (watch the dotted outline box that follows the mouse cursor as you drag a file). These types of actions show a noticeable lag when GDOS is present that gets worse as you add more AUTO folder programs and desk accessories.

G+PLUS completely eliminates this problem: You can leave G+PLUS installed in your computer all the time without ever noticing any slowdown. This is what Atari probably intends to be done with GDOS, but many people find themselves using GDOS only when they need it to run a certain program, and then rebooting to rid it from the system. You are encouraged to run your own tests with GDOS and G+PLUS to verify the differences in speed for yourself. (See "The ZoomTest Program.")

G+PLUS also incorporates features that can make the use of GDOS programs almost hassle-free. To change your list of fonts with Atari's GDOS, it's necessary to reboot your computer so that a new ASSIGN.SYS file can be read. With

G+PLUS and the G+PLUS Accessory, you can read in a new list of fonts any time you run a program...with no need to reboot, ever.

Due to small differences in the way some programs use GDOS, you often have to reboot when going from one GDOS program to another. For example, DEGAS Elite (which uses GDOS only for screen display of fonts) gets very unhappy when you run it with the ASSIGN.SYS file that works with Timeworks Desktop Publisher. Similarly, running Timeworks Desktop Publisher with another program's ASSIGN file will not work; Publisher handles font assignments differently from other GDOS programs, and will be unable to recognize the fonts in this case. Once again, with Atari GDOS you'll have to reboot the computer to get at the fonts that Timeworks Desktop Publisher expects to see.

However, with G+PLUS, you can arrange things so that the proper ASSIGN.SYS file for each program is loaded *automatically* when you run it. This feature (called the "Installation File" - explained above) makes it very simple to switch between different GDOS programs. Once you've created an Installation File with the G+PLUS Accessory, you'll be able to treat your GDOS programs like any other ST program...just run them in any order, whenever you want, without rebooting or crashing. Using GDOS was never like this!

If you use GDOS for any length of time, you'll notice that some programs that seem to work fine when GDOS is not present will crash and reset your computer when GDOS is active. G+PLUS contains special code to handle the most common causes of these incompatibilities...which means that many programs that don't work with Atari GDOS get

along famously with G+PLUS. It should be noted that these problems are not really the fault of GDOS; in all the cases of crashing programs we've analyzed, the trouble was always due to poor programming techniques on the program's part - not problems in GDOS. Nonetheless, G+PLUS avoids most of these problems too, and as a result ends up being more compatible with the majority of ST software than Atari GDOS.

## WHY IS G+PLUS FASTER?

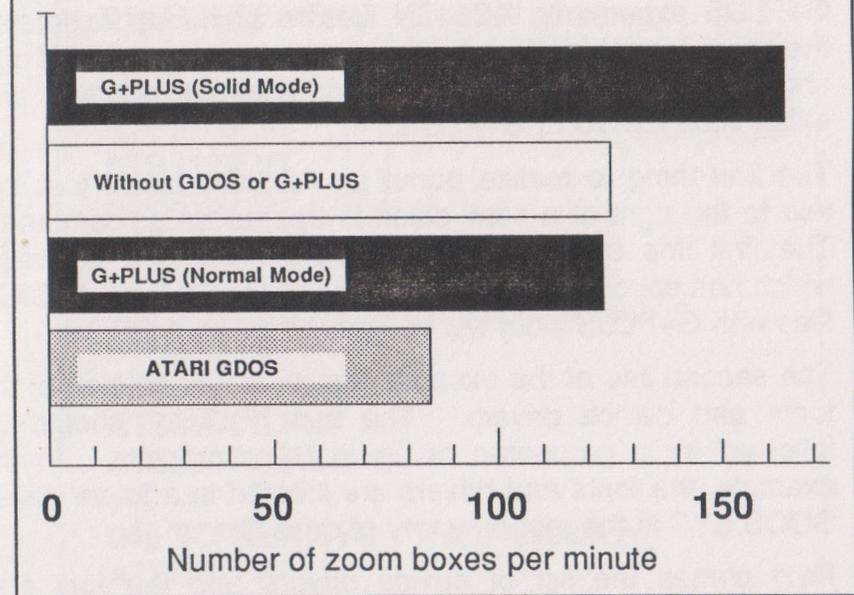
G+PLUS is written in assembly language by programmers who use their STs daily. GDOS was written in 'C', presumably by programmers who do not use the ST enough to realize that it is slowing down their system. Every call to the VDI must go through GDOS (or G+PLUS). Since the AES event system calls the VDI constantly to check for key presses (among other things), it's only natural that there is some slowdown caused by the added routines. In G+PLUS, we have optimized these routines to perform very quickly. Under normal operation, the presence of G+PLUS is imperceptible. And when Polyline Style is set to "Solid," G+PLUS actually speeds up many of the desktop's operations!

## The ZoomTest Program

We've included a program to let you test this speedup for yourself, if you're so inclined. The Zoom Test program calls the AES `form_dial` function to draw a variable number of "zoom boxes." You can choose to run up to 50 repetitions of the test, and the program will keep track of elapsed time to within 1/100th of a second.

Figure Two shows a graph of the results we've been able to achieve with the Zoom Test program.

## SYSTEM SPEED COMPARISON



Results shown are from the ZoomTest program included with G+PLUS, which calls the AES `form_dial` function to draw a variable number of "zoom" boxes. Each test was run five times on three different system configurations and the average time is given. As you can see, a system with G+PLUS installed runs at almost the same speed as a "bare" system; and if Polyline Style is set to "Solid" a system with G+PLUS runs almost twice as fast as a system with Atari GDOS.

Figure Two.

## Introduction to ASSIGN files

To maintain maximum compatibility with Atari GDOS, G+PLUS expects its ASSIGN files to be in approximately the same format as the ones you already use. Figure Three shows an example ASSIGN file that could be used with either Atari GDOS or G+PLUS.

The first thing to realize about an ASSIGN file is that any text to the right of a semi-colon is treated as a "comment." The first line of the example ASSIGN file is a comment which has special meaning to G+PLUS (see "Using ASSIGN files with G+PLUS") but will be ignored by Atari GDOS.

The second line of the example specifies the location of the fonts and device drivers. The text "PATH=" should be followed by a pathname of up to 64 characters. In the example, the fonts and drivers are located in a folder called GDOS.SYS in the root directory of drive C:.

Next comes the list of device drivers and the font files associated with each of them. Atari has reserved certain ranges of ID numbers for each possible device, as follows:

- 01 - 10 Screen drivers
- 11 - 20 Plotter drivers
- 21 - 30 Printer drivers
- 31 - 40 Metafile drivers

There are screen drivers for each resolution built into the ST's ROM. The screen drivers use device ID numbers 01 (default screen), 02 (low res), 03 (medium res), and 04 (high res). If a device driver name is followed by a "p", the driver is located in the ST ROM. The filename "screen.sys" is not used, but is necessary as a place holder.

```
; G+PLUS: Sample ASSIGN file
PATH=C:\GDOS.SYS
;
01p SCREEN.SYS ; default screen
;
02p SCREEN.SYS ; low resolution fonts
ATSS10.FNT
ATSS12.FNT
ATSS18.FNT
ATSS24.FNT
;
03p SCREEN.SYS ; medium resolution
ATSS10CG.FNT
ATSS12CG.FNT
ATSS18CG.FNT
ATSS24CG.FNT
;
04p SCREEN.SYS ; high resolution
ATSS10.FNT
ATSS12.FNT
ATSS18.FNT
ATSS24.FNT
;
21 FX80.SYS ; Epson 9-pin printer driver
ATSS10EP.FNT
ATSS12EP.FNT
ATSS18EP.FNT
ATSS24EP.FNT
;
31r META.SYS ; metafile driver
```

Figure Three.

Following the font definitions for the ROM screen drivers are the definitions for the drivers which must be loaded from disk. Device ID 21 is a printer driver, and must be loaded from the file FX80.SYS, in the directory defined in the "PATH=" line. The fonts following this driver file will be loaded from the same directory.

The metafile driver META.SYS is a special case in our example. Its device ID number has an "r" following it, which means that this driver file is to be loaded at bootup time and remain "r"esident. This is the only time GDOS or G+PLUS will load any device drivers at bootup; if the "r" flag is present after a device ID number. Only the device drivers themselves may be flagged as "resident", not the fonts associated with them.

For more complete information on setting up and using ASSIGN files, consult the text file GDOS\_INF.DOC by Douglas N. Wheeler on your G+PLUS master disk. You can either show this file on screen or list it to your printer by double-clicking on its name from the desktop.

## Developers' Information

The technical information in this chapter is provided for developers who wish to support the special capabilities of G+PLUS. If you're not a programmer you can skip this section entirely.

G+PLUS contains built in "hooks" to enable developers to write programs that can reload fonts and device drivers without the need to exit, and without losing compatibility with Atari GDOS. The following code checks for the presence of G+PLUS, and returns the address of its "backdoor" structure:

```
move.w #$472B,d0 ; Query for "G+"
trap #2 ; Knock, knock...
cmp.w #$472B,d0 ; Is G+PLUS there?
beq continue ; If equal, no G+PLUS
move.l d0,save_ptr ; Save pointer to backdoor
```

On return from the trap call, d0 will be unaltered if G+PLUS is not installed. Otherwise, d0 will contain a longword pointer to the G+PLUS "backdoor" structure:

Offset

|    |      |            |   |
|----|------|------------|---|
| 0  | dc.l | ass_load   | ; Pointer to assign.sys load routine                    |
| 4  | dc.l | dev_ptr    | ; Pointer to array of device types                      |
| 8  | dc.l | font_ptr   | ; Array of 11-byte font names                           |
| 12 | dc.l | the_works  | ; Pointer to workstation structures                     |
| 16 | dc.l | os_ptr     | ; Pointer to GEM's basepage                             |
| 20 | dc.l | name_ptr   | ; Pointer to current assign.sys name                    |
| 24 | dc.w | fload_flag | ; "Fonts Loaded" flag, 0=no fonts                       |
| 26 | dc.l | handle_ptr | ; Pointer to internal workstation<br>; handle structure |

The first entry in the backdoor structure, **ass\_load**, points to a routine which can be used to load a new ASSIGN file. First get the filename from the user (with a file selector or however you normally do this). At this point, you should perform a "New" operation and clear any existing documents from your program's workspace. Next, release all fonts for each device with the **vst\_unload\_fonts** call, then close all open workstations (both virtual and physical). Now, call the **ass\_load** routine with the following code:

```

move.l  #name,-(sp) ; Push pointer to filename
move.l  save_ptr,a0 ; Get address of backdoor
move.l  (a0),a0     ; Get pointer to ass_load
jsr     (a0)        ; Call the routine
addq   #4,sp       ; Correct the stack
tst    d0           ; Check for error
bne    error       ; If not zero, error occurred

```

On return from the routine, a non-zero value in d0 indicates that an error occurred. The possible error numbers are:

- 1        Miscellaneous error
- 2        Insufficient memory
- 3        Corrupted driver file
- 4        Illegal workstation ID
- 5        Partial record found
- 6        Invalid filename
- 7        Drive spec not allowed in font filenames
- 8        Fonts/device drivers currently in use

Now you can re-open your workstations, and re-load the fonts for each device. Since you have a new set of fonts, you'll also need to re-execute any font initialization code. If you're interested in the other entries in the backdoor structure, contact CodeHead Software for more details.

## GLOSSARY

- AES**                    Acronym for "Application Environment Services." The AES is the portion of the ST operating system which is responsible for handling windows, menu bars, dialog boxes, etc.
- AUTO FOLDER**        When the ST starts up it searches the root directory of the boot drive for a folder named "AUTO". If this folder exists, any programs contained therein will be executed in the same order that they were written to the folder. (Note: programs that use GEM may not be run from an AUTO folder.) G+PLUS.PRG must be in your AUTO folder when you boot your computer in order to be properly installed.
- BOOT UP**              The process of starting up a computer. The name comes from the term "bootstraps". The ST will boot up (or re-boot) whenever the power is turned on or the reset switch is depressed.
- DEVICE**                For our purposes, a device is anything which produces output, such as a monitor screen, a printer or plotter. One of the main features of GDOS (and G+PLUS) is its ability to easily produce output on many different types of devices.

**DEVICE DRIVER** The program used to send output to a device. The screen device drivers are permanently installed in the ST. All other device drivers are disk files which must be specified in the ASSIGN.SYS file and present in the same folder that contains your GDOS fonts.

**FONT** A set of graphic images corresponding to the letters of the alphabet. GDOS fonts are loaded from disk when needed. A font has a header which describes its point size, name, and other pertinent information.

**GEM** Acronym for "Graphics Environment Manager." GEM is a broad term for the ST's user-friendly interface incorporating windows, menus, and dialog boxes.

**PATHNAME** A text string defining the name and location of a disk file. A full pathname begins with the drive letter followed by the directory name and the file name, for example "A:\GEMSYS\WORDUP.SYS".

**ROOT DIRECTORY** The main area of a disk, meaning not within a folder. GDOS (and G+PLUS) expect to find the file ASSIGN.SYS in the root directory of the boot disk.

**TOS ROMS** The set of computer chips which contain the ST's operating system. TOS is an acronym for "Tramiel Operating System." A TOS program is one that does not use the features of GEM.

**VDI** Acronym for "Virtual Device Interface," the part of the ST's operating system which is responsible for producing graphics output.

**WORKSTATION** The set of parameters that defines the size, resolution, and other pertinent data for each device. A program opens a workstation for each device to which it sends output.

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Programs and manual written by John Eidsvoog and Charles F. Johnson.

Cover art and CodeHead Software logo designed by Maurice Molyneaux.

Special thanks to our beta testers, Lloyd Pulley and Darek Mihocka.

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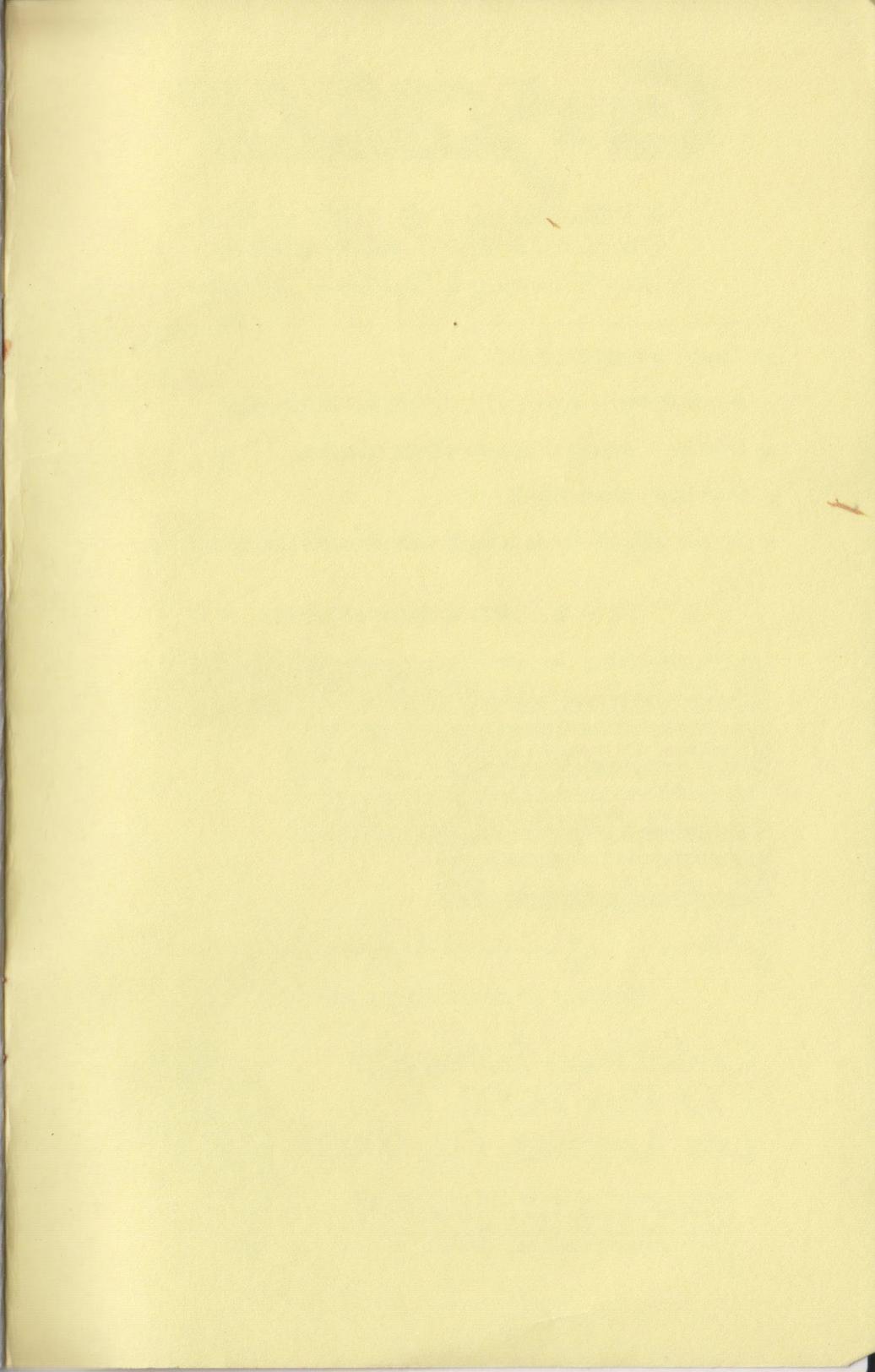
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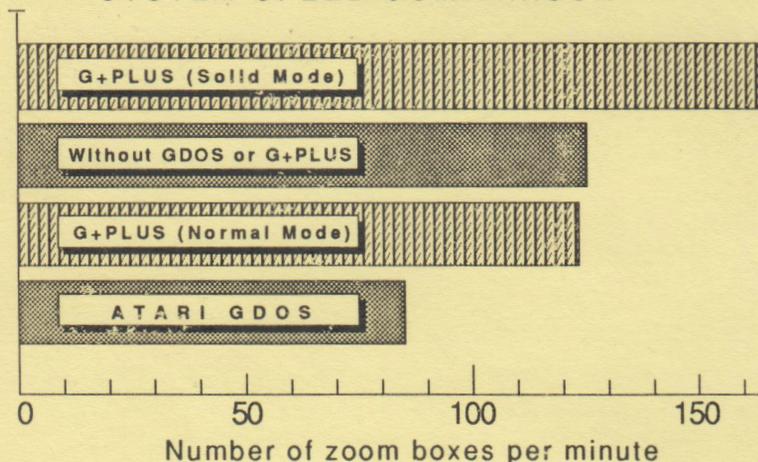
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A POWERFUL AND COMPLETE  
REPLACEMENT FOR GDOS

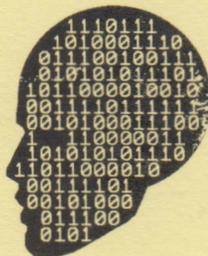
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- Totally compatible with GDOS.
- No slowdown -- leave G+PLUS installed all day long!
- Load fonts and device drivers without rebooting.
- Even boot without ASSIGN.SYS.
- Special solid line mode actually speeds up desktop operations.

## SYSTEM SPEED COMPARISON



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G+PLUS works with the entire family of Atari ST computers.  
It is intended to be used with programs that require GDOS.  
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