GS+®

November
December
1993

Volume 5
Number 2

The *First* Apple IIGS® Magazine + Disk Publication!

Have You Been Good?

Well . . . heck, Santa Bob doesn't care!
He's bringing you the new *GS+*
Magazine early anyway!
Inside it, you'll find:

How to clean eggnog and tinsel out of your IIGS!

How to hook your Christmas tree lights up as a SCSI device!

A program that lets you open GS–ShrinkIt archives without leaving the Finder!

A program that lets you get files off of naughty CD-ROMs!

A great game about things that blow up!

Plus, Santa Bob's Little Helpers Review

3D Logo
Focus Drive Hard Card
Prism
Tulin Floptical Disk Drive

Writer's Block

By Steven W. Disbrow

Well, this is odd. Instead of writing this column at the very last minute, I'm trying to get it written just days after mailing out our last issue. (We mailed out V5.N1 on the October 19th, and it's October 26th as I write this. It was Michelle's idea, something about "getting back on schedule.") So, I really don't have that much to talk about. I suppose I'll have to just let my fingers wander over the keyboard until I can think of something that ticks me off, and then I'll try to write a lengthy discourse on the subject. Let's see, what *really* ticks me off is . . . .

Well, the situations in Yugoslavia and Somalia really tick me off. But, what the heck can I do about those? I don't think that I can sway any world leaders by writing in a computer magazine. Still, if I were to start hanging out at McDonalds, I might be able to bend the ear of President Clinton. Hmmm, McDonalds. Nah, I'm not *that* upset about *anything*.

I'm ticked off at the American people for having such short memories. Remember who got us involved in Somalia? Remember what happened the last time we became a country of isolationists? (I believe it was called World War I.) Remember that time the Earth exploded and we had to move to this planet in giant space ships? Remember that it was decided that we wouldn't tell the stupid people about it because they might panic? Remember the person that originally told that joke? (His name was Steve Martin.)

Well, I guess that's enough about current events, let's turn to the world of computing and see if anything comes to mind.

Sculley's Out

Just days ago, John Sculley retired from Apple Computer Inc. While many Apple II owners may be rejoicing at this news, I personally see it as a very bad thing. I know that a great many II owners hold Mr. Sculley personally responsible for the demise of the Apple II, but he was also responsible for keeping Apple on the cutting edge of technology (quite a bit of which ended up on the IIGS). What worries me is that, without Mr. Sculley, Apple will become just another PC maker, and eventually, will go the way of the dodo. Of course, their PCs will probably be Macs and not IBM compatibles. (Let's face it, if Apple were to get into the PC Clone market, they would get their privates handed to them in a basket with a nice bow on top.) But, will those Macs be worth a darn, or will we just see tiny variations on the current Macintosh line up, with only one or two new CPUs a year?

Don't get me wrong, I hate the "Mac of the month" mentality that Apple has been using the past few years. However, in the last year or so, each new Mac that Apple put out was actually a good step forward (the PowerBooks and the AV Macs are good examples of this). My concern is, will Apple lose its edge, or will they be able to continue innovating and differentiating themselves from the rest of the computers that are out there?

Then again . . . why should I care what happens to Apple?

Newton

Of course, the main reason I care about what happens to Apple is that we've made some friends there, and I don't want to see anything bad happen to them. (However, these are all talented people, and whatever happens to Apple, they should get by with no problems.)

But, another reason is that we've invested quite a bit of money in developing software for Apple's newest computer, the Newton. (Don't panic! We aren't abandoning the IIGS! It's just that we are really excited about the Newton, and we want to see if we can do something worthwhile with the technology. *GS+* Magazine still pays the bills around here, and, in fact, having the Newton has given me some ideas for IIGS programs . . . .) So, if something should happen to Apple, our prospects for making money in the Newton market become slim. Of course, there are already rumors that, as a result of Sculley leaving, Apple might be selling the division that handles the Newton and related products. Sheesh.

Oh, and if you have a Newton of your own, you can send me NewtonMail—my handle is "Diz". If you don't have a NewtonMail account, you can still send mail to my Newton by sending mail to "Diz@online.apple.com". Drop me a note, or a to-do list, or a calendar entry or a . . . .

Separate Products

For the last few issues, I've been talking about our plans to release EGOed and a few of our other programs as stand-alone packages. However, given the current state of the IIGS market, I am seriously re-thinking that idea. Why? Well, lets just say that we shipped twice as many copies of File Dump in our last issue than WestCode has sold of TypeSet in the last two months. In fact, the *GS+* Disk is probably the second-best-selling IIGS-specific software product on the market at this time. (Softdisk G-S has more subscribers than us.) Considering the small number of subscribers we have, that's a very *scary* thought.

This leads me to believe that we would be better serving you, the subscriber, by continuing to publish these products here in *GS+* Magazine—simply because more of you will get to use them, and at a much lower price.

Back Issues

Well, tax time is almost upon us again, and our mail room is bursting at the seams with back issues. So, to reduce our inventory, we are going to have a big back issue sale from now until February 28th. For complete information, see the "*GS+* Back Issue Information" page elsewhere in this magazine.

Thanks Michelle

I forgot to mention this in the last issue, but, as of last issue, Michelle has taken over just about 100% of the page layout duties for *GS+* Magazine. This is a great time saver for me, and I just wanted to thank her for taking on this important task. And, to top it all off, she's good at it! I thought the last issue looked great, and the pages she's already done for this issue look just as good! Thanks again Michelle!

Tie Dye T-Shirts

At this point, we have orders for five Tie Dye T-Shirts, we need orders for at least 10 shirts before we can justify taking the time to make another batch. So, if you've been putting it off, don't hesitate any longer, order yours now! (For complete information on these shirts, see the **a.Read.Me** file on your *GS+* Disk or give us a call here at the office.

Well, I seem to have strayed somewhat from my original topic—whatever that may have been. Hopefully, that's all I have room for this time. Maybe I should just have Michelle lay out this page at a larger point size . . . .

Diz

CONTENTS

FEATURES

IIGS Maintenance—Part 1: The Mouse and Keyboard.....6
SCSI ("Simple Connections," Says Igor.).....10

PROGRAMS

Balloon v1.0.....38
Balloon Guts.....40
CD-ROaM.....13
KaBlooie!.....18
Miscellaneous Library.....43

DEPARTMENTS

Writer's Block..... inside front cover
Letters.....3
What's New.....21
GS+ Back Issue Information.....22
Rumors, Wishes & Blatant Lies..... 23
How to Use Your *GS+* Disk..... 24
How to Get System 6.0.1..... 26
The *GS+* Index : Part 2.....44
Warranty Disclaimer and Copyrights..... 46
Glossary.....47
GS+ Classifieds.....48
GS+ Ordering
Information.....inside back cover

REVIEWS

• 3D Logo.....28
Focus Drive Hard Card.....32
• Prism 34
Tulin Floptical Disk Drive.....36

Products marked with a bullet (•) were review copies provided by the publisher.

ADVERTISERS

Alltech Electronics.....27
Big Red Computers..... 20
LRO Computer Sales..... 16, 17
Parsons Engineering.....inside back cover
Pegasoft.....12
Sequential Systems.....31
Sound Source Unlimited.....5
TMS Peripherals..... back cover

GS+ Magazine

November-December 1993
Volume 5, Number 2

Publisher, Editor
STEVEN W. "NIXON" DISBROW

Executive Assistant to Mr. Disbrow
NOREEN M. "CUPID" DISBROW

Technical Editor
JOSEF W. "DASHER" WANKERL

Production/Marketing Coordinator
MICHELLE B. "VIXEN" RIBARIC

Operations Director
ROBERT A. "SANTA BOB" RIBARIC

Contributing Editor
WILLIAM "JINGLEBILL" MOORE

On the Cover

Santa Bob brings joy, and the latest issue of ***GS+*** Magazine, to all of our readers. (We've found Santa Bob to be faster and more reliable than the Postal Service.)

GS+ Magazine and its companion program diskette are copyright © 1993 by EGO Systems. No part of the magazine or its companion program diskette may be reproduced without the written permission of EGO Systems. The programs on the companion program diskette are *not* public domain or shareware!

GS+ is a registered trademark of EGO Systems.
All references to either Apple or third party products are trademarked and should be so noted.

GS+ Magazine is an independent publication, not affiliated in any way with Apple Computer, Inc.

Opinions expressed in this publication are those of the individual authors and do not necessarily represent those of *GS+* Magazine or EGO Systems.

Subscription rates - Magazine only:
1/2 year (3 issues) - $8
1 year (6 issues) - $15
Subscription rates - Magazine with Disk:
1/2 year (3 issues) - $20
1 year (6 issues) - $36

Tennessee residents add 7.75% sales tax.
Add $1.50 per issue if you want First-Class delivery.
Canadian and Mexican orders add $1.50 per issue.
Other foreign orders add $1.50 per issue for surface delivery or $5 per issue for Air Mail.

Send orders, ads, inquiries, and address changes to:
GS+ Magazine
P.O. Box 15366
Chattanooga, TN 37415-0366

Or phone Monday-Friday 9 am-6 pm Eastern Time:
(800) 662-3634 (orders only)
(615) 843-3988 (tech support)
(615) 843-3986 (fax)

If you have a submission for *GS+* Magazine, send it to:
GS+ Submissions
P.O. Box 15366
Chattanooga, TN 37415-0366

GS+ Magazine can also be contacted on these online services:
America Online: send mail to GSPlusDiz
or visit our online area by using the keyword GSMAG.
Delphi: GSPlusDiz
GEnie: JWankerl
InterNet: gsplusdiz@aol.com
NewtonMail: Diz

GS+ Magazine is published bimonthly by:
EGO Systems
7918 Cove Ridge Road
Hixson, TN 37343-1808
(DO *NOT* SEND MAIL TO THIS ADDRESS—USE FOR UPS AND OVERNIGHT DELIVERIES ONLY!)

GS+ Magazine is created with:
EGOed - Text Editing
GraphicWriter III - Interior Page Layouts
AppleWorks GS - Cover Layouts
Platinum Paint - Screen Shots
Proof pages are printed on an Apple LaserWriter IINT.
We use a Macintosh LC III as a file server because we have to.

Letters

Dear Sir,
Attached is my check for a one year subscription to *GS+* Magazine and Disk. I recently had the opportunity to read for the first time a copy of your magazine (the September/October 1993 edition [V5.N1]), and I was extremely impressed. It was absolutely fantastic. There is no doubt in my mind that this is *the* definitive source of information for the IIGS. I have had my IIGS only since February 1992 . . ., and I really enjoy this machine. I am retired now, but while I was working, I used many IBM/clones, but none of them, including a loaded 486 machine with tons of software, provided me with the fun and creative use that I now get from my IIGS.

I was hoping to be able to buy a couple of back issues containing reviews of products I was interested in, but I found that the issues were out of print. I assume you still have the information/articles somewhere in your files. Have you considered the possibility of providing copies of various articles in page print or on disk? This would be a source of additional revenue for you and would be a tremendous service to those of us who were unfortunate enough to have missed the articles initially. Also, do you ever consider recycling topics? I am looking forward to seeing and using some "cool cursors," but I am very interested in icons as well . . . .

John Engberg
Bowie, MD

Thanks for the comments John, I am always glad to hear that you like what we are doing!

To answer your questions, yes, we do still have the information that makes up all of our back issues, but at this point, our efforts to reprint those issues (in one form or another) are in limbo. Still, we are trying to make those back issues available and we'll let everyone know just as soon as they are ready. In the mean time, be sure to check out the sale we are having on the back issues we do have! (The information on the sale is elsewhere in this issue.)

As for "recycling" topics, we have done that, but not very often. (Although we do recycle our programs fairly regularly.) Actually, now that you ask, I am surprised that we haven't recycled more topics!
Diz

Dear Mr. Disbrow,
Thanks for the great article on Object Oriented Programming using ORCA/Pascal. I will be going over the File Dump source code for the next two months until I get my next issue of *GS+*. I hope you will keep more articles on Object Oriented Programming for ORCA on the agenda as I can use all the help I can get at this point. Also, if you can recommend any books that would just be great, as I finally found a bookstore in Houston that has some books about Object Oriented Pascal and Object Oriented Programming in general . . .

I would also be interested in a review of the Pegasoft Pascal Precompiler, do you use it? I see their ad in *GS+* and the last one said they also supported Object Pascal . . . . Just what exactly is a precompiler for Pascal? I know C uses a precompiler but the whole thing is unclear to me, any light you can shine on the subject would be appreciated . . . .

Robert Hollingsworth
Houston, TX

Glad you liked the Object Oriented Programming (OOP) introduction Robert! Don't worry, I've got plenty of other OOP projects planned for the future, so you shouldn't have any shortage of source code!

By the way, you didn't say what the names were of those books you found about Object Oriented Pascal. If you could, write me back and let me know what they are—I'd love to get them myself!

As for Pegasoft Pascal, I don't personally use it at this point, but Pegasoft has been gracious enough to send me a review copy of it, so I do plan on reviewing it as soon as I get a little more familiar with Object Oriented Programming. Like the ads say, it's a pre-compiler for ORCA/Pascal. Pegasoft Pascal simply gives you access to some new commands and functionality that aren't normally a part of ORCA/Pascal. You type these commands into your source code just like you would any other Pascal command. Then, the Pegasoft Pascal pre-compiler looks at your code, and turns those new commands into standard ORCA/Pascal statements. It then passes the "cleaned up" code to the regular ORCA/Pascal compiler. (This is an over simplification, but that's the basic idea behind it.)
Diz

Diz,
I was happy you reviewed Your Money Matters (YMM) [in *GS+* V4.N6], but I would tend to agree with the comments in the letter you printed supporting YMM. It seems to me that the reviewer wanted a IIGS version of Quicken. While Mark [Ranes] mentioned some of the many features in YMM that are lacking in Quicken, in summarizing he seemed to compare the ease of use of a program that he had used for years to the ease of use of a program he had only recently started using.

Thankfully, my response to the program from users has been very positive. For users who buy YMM from me, I offer a 60 day moneyback guarantee on the program, and I have had less than 1% returned. I have heard back from a number of users who did not feel the review was fair, and I heard from one user who bought the program in spite of the review and said they were glad that they did.

There are no known or duplicatable problems with the program what would cause it to crash. Of the 20-30 Apple IIgs programs that I use regularly, there is not a one that has not hung up on me a number of times. With the large number of variables in hardware and software which can be installed finding the source of a problem which can't be duplicated is next to impossible.

In spite of having ten people besides myself review the manual I found that about 20% of my users need more hand holding in the tutorial. I have been working with two different people during the last 9 months trying to get a new tutorial written. Unfortunately they like myself have other jobs as well and finding enough time to do it is very difficult.

Robert Levy's problem ["Letters" in *GS+* V5.N1 - Ed.] with printing text to the Epson printer is due to limitations in the systems Epson printer driver. I put in special code to improve the text printing to the Imagewriter. Support for better text printing will not be in the next update since reports can be printed to disk and then printed using any text based word processor. However, this will be included in the following update.

Your Money Matters is being updated and the next release will include a new tutorial as well as the ability to select fonts for all windows and reports, better support for

Quicken style continuous checks, plus a number of other additional features. This first update will be sent to all registered users free of charge.

Steve Peterson
Author of Your Money Matters
Software Solutions
Edina, MN

Thanks for the letter Steve. I'm sorry the review wasn't more positive, but I felt that it reflected the feedback that we had gotten here about Your Money Matters, not to mention our own experiences with the program. At any rate, we are looking forward to seeing the updated version, so please keep us posted!
Diz

Dear Diz,
. . . With the demise of *A+/inCider*, an information sink (well, a small one) has been formed for the IIGS (as well as 8-bit II) user. While the programs included on the *GS+* Disk remain excellent examples for the aspiring GS programmer, I am appreciative of the refocusing of the printed *GS+* Magazine, as there are probably many more GS *users* in need of help by EGO Systems than programmers.

The first two articles in the "Scavenger" series bridge a gap (pun intended) that was left unfilled when Gregg Keizer's *A+/inCider* series ["Bridging The Gap"] was discontinued. This is the kind of information that will keep the IIGS in use far into the next century . . . .

Ryan M. Suenaga
Kaneohe, HI

GS+ Magazine,
I have a problem and hope that you can answer my questions. My Apple 3.5-inch disk drive just died . . . . My Apple dealer said it would cost about $350 to fix my drive and that I could buy a new one for that price. They suggested a cheaper way to go is the Applied Engineering 3.5-inch drive. Is this a good drive? Will I need a cable to make it work with my IIGS? I only want the 800K version, not the 1.44MB . . . .

Robert McQueen
Florence, SC

I reviewed the original Applied Engineering 3.5-inch drive way back in GS+ *V2.N2 (three years ago!). Since that time, we've used that same drive to duplicate several thousand diskettes, and it hasn't given us one bit of trouble. There are no special cables or drivers to use—it's a 100% compatible replacement for the Apple drive. However, if you are going to spend the money for a new drive, I would probably recommend that you go ahead and get the 1.44MB version. Without a SuperDrive controller card it will work* exactly *like the 800K version, and you'll have the capability to go to 1.44MB later.*
Diz

Dear Steve:
. . . I have been having several problems. My biggest problem is that I have not been able to exit from any ProDOS 8 programs back to GS/OS. I may have isolated this problem to AutoArk version 1.0. I have had similar problems with Katie's Farm, but disabling AutoArk did not resolve it. I was wondering if there is something obvious I don't know about?

Name Withheld

I contacted D. Proni (author of AutoArk) at ECON Technologies about your problem and he confirmed that this was *a problem in version 1.0 of AutoArk. However, this problem is fixed in the latest version, 1.0.2. If you have sent in your registration card, you should have received notice of this free update directly from ECON. If you haven't, now would be a great time to send in that card!*
Diz

GS+,
Just read your review of the Applied Engineering High Density drive and Apple's SuperDrive Controller [*GS+* V5.N1]. There are a few things you really ought to be aware of.

Firstly, if you have a HD drive (from AE or Apple), you can *write* and *format* [MS-DOS] disks right now! I released a set of shareware utilities in early September which allow you to copy files in both directions, format disks, and do the usual file maintenance (delete, etc) for MS-DOS disks. They also work with flopticals, 5.25-inch drives attached to a PC Transporter (and PC Transporter hard disk partition files on a GS/OS hard disk), and with SyQuest cartridges (which is more than Apple's FST will do!).

I know the MS-DOS Utilties have been uploaded to Genie, and they appeared on the most recent A2-Central-On-Disk. They are also on at least one InterNet archive site. And they're not bad value for $15.00! It's worth paying to get the latest versions for the bug fixes, extra features and extra utilities (e.g. create/delete sub-directories).

Secondly, the problem you noticed where the first attempt to format a disk fails if it was previously formatted for MS-DOS, appears to be a problem with the SuperDrive Controller card. I first noticed this last year using Apple's card and SuperDrive, and mentioned it to the Apple guys at KansasFest. They thought that it was a known problem, although without a known solution! Maybe it's worth seeing if Apple made any progress in the last 15 months! You should have noticed that it only occurs on 720K disks, since 1440K disks are low-level formatted the same for both Apple and MS-DOS.

Not having used Replicator, I can't say I've seen the "never stops writing" problem, but to be honest, it also sounds like a problem with the card. I have another utility which seems to think that 1440K disks have some *huge* number of blocks when it's doing a verify of the disk. Everything works fine until it gets to block 2880 (i.e. 1440K + 1) and from there it just says I/O error for each (theoretical) block. I'm just wondering if this is any help towards finding the problem with Replicator?

Lastly, a floptical can handle 720K disks, but not 800K. Certainly there are users of my utilities using 720K disks in flopticals. There *may* be some combination of controller card, driver software and brand of floptical, that doesn't handle 720K disks, but I'm not aware of any. The other comment is, the impression I got, is that flopticals are still not totally stable in terms of use on the IIGS. While this is probably due the third-party drivers being used, it's still a consideration for the less technically minded users.

Peter Watson
Victoria, Australia
via the InterNet

Thanks for the information Peter! And thanks for writing those utilities! We've had several readers tell us about them since our last issue appeared, and we'll try to get a review in our next issue.
Diz

If you have a question, comment, or criticism about *GS+* Magazine, we want to hear it! Due to space limitations, we cannot answer every letter here in *GS+* Magazine.

If you want a personal reply, please include a daytime phone number, or enclose a self-addressed, stamped envelope with your letter.

Please address all letters to:
GS+ Letters
P. O. Box 15366
Chattanooga, TN 37415-0366 *GS+*

AUDIOCLIPS® TERMINATE BOREDOM

You've heard about AudioClips for the Mac and PC. But you haven't heard them from your IIGS. Until now.

Sound Source introduces Star Trek® and T2™ AudioClips for Apple IIGS users. They're the ultimate desktop diversion for sci-fi fans.

STAR TREK®

Set your IIGS on *stun* with these authentic clips from the original Star Trek television series. Features classic lines from Kirk, Spock, Bones, Chekhov, Uhura, Scotty and Sulu. Also included are bridge sound effects and memorable music cues. A must for Trek fans.

TERMINATOR 2™ JUDGMENT DAY

He'll beep back! With Arnold Schwarzenegger at the helm, you can cyberdize your work environment with your favorite T2 dialog and sound effects. You'll hear lines from Terminator, Sarah Connor and her son John, plus ambient morphing, machinery and mayhem!

ONLY $24.95 EACH

OR $39.95 FOR BOTH

Order direct from Sound Source:

(800) 877-4778

VISA MasterCard

2985 E. Hillcrest Dr., Suite A
Westlake Village, CA 91362
Tele (805) 494-9996 Fax (805) 495-0016

AudioClips is a registered trademark of Sound Source Unlimited, Inc. STAR TREK © 1993 Paramount Pictures. TM, ® & © 1993 Paramount Pictures. All Rights Reserved. Terminator 2: Judgment Day © Carolco Pictures Inc.

IIGS Maintenance—Part I: The Mouse and Keyboard

By Bill Moore

Every IIGS owner has one, and almost no one gives them a second thought until they don't perform as expected. I speak, of course, about your mouse and keyboard. The two most important input peripherals you can have, and yet almost no one gives these devices any thought on how to make them perform better, or more reliably. They're just used until something goes wrong. This article is meant to make you more aware of how your mouse and keyboard work, and how to keep them operating at top efficiency.

Of Mice and Men

First thing we'll start with is the mouse. There are two extraordinarily simple and usually inexpensive ways to keep your mouse performing at peak capacity for years. The first is to buy a mouse pad. This gives the mouse a uniform, friction-free surface over which to roam, in addition to giving you a chance to put some cool artwork on your desk. There are literally thousands of kinds of mousepads out there, but these are the things *I* look for in a pad. First, the surface should *not* be made of any kind of cloth. Over time (and with extended use,) the cloth will begin to deteriorate, and the remains *will* find their way into the innards of your mouse, degrading its performance. Always look for a pad with a smooth, plastic-like top. If you're a Trekkie, MousTrak sells mouse pads of the type I recommend, with some cool Star Trek related art. You can get one with the painting of the **Enterprise™** that hangs in Picard's ready room, or a montage of the Next Generation cast with the Enterprise, or one of the movie Enterprise (which is the largest, and the one that Joe Wankerl and I own.) Both Direct Micro and MacConnection have these, or try Quality Computers. The Apple Catalog also sells pads of this type, with Apple's logo on them, of course.

The second investment will help you maintain both your mouse and keyboard. Get a can of camera lens cleaner. I call this "canned air." It's actually liquid freon that's shot out through a very small hole, vaporizing it and producing a stream of inert (and chemically pure) air. (This is the 90's, so ecology-conscious people can rest easy—these cans don't produce CFC's.) These are available in photo-supply houses, Sam's Wholesale Club, K-Mart . . . in short, nearly everywhere. By using this regularly, you can keep the mouse and keyboard in tip-top shape. Canned air is really easy to use—just point-and-shoot. Most cans sold today come with a small tube to make more precise cleaning easy. It's also useful for many other things, such as blowing dust from other crevasses inside your IIGS, lifting the skirts of unsuspecting females, etc.

Canned air is fine for routine light cleaning, but if you have lots of nasty crud that won't blow away, you'll need something a little more extreme. For this, I recommend cotton balls, cotton swabs, and rubbing alcohol.

A Clean Mouse is a Happy Mouse

If you've bought a mouse pad, and taken out the ball and cleaned out the mouse thoroughly with canned air, and it *still* won't track right, a more extreme cleaning may be called for. In that case, we'll have to open up the mouse and clean the inner components as well. Don't panic, I'll explain how to do it thoroughly, and with photos.

Cleaning a mouse thoroughly is simplicity itself. First, we have to determine who made your mouse, because

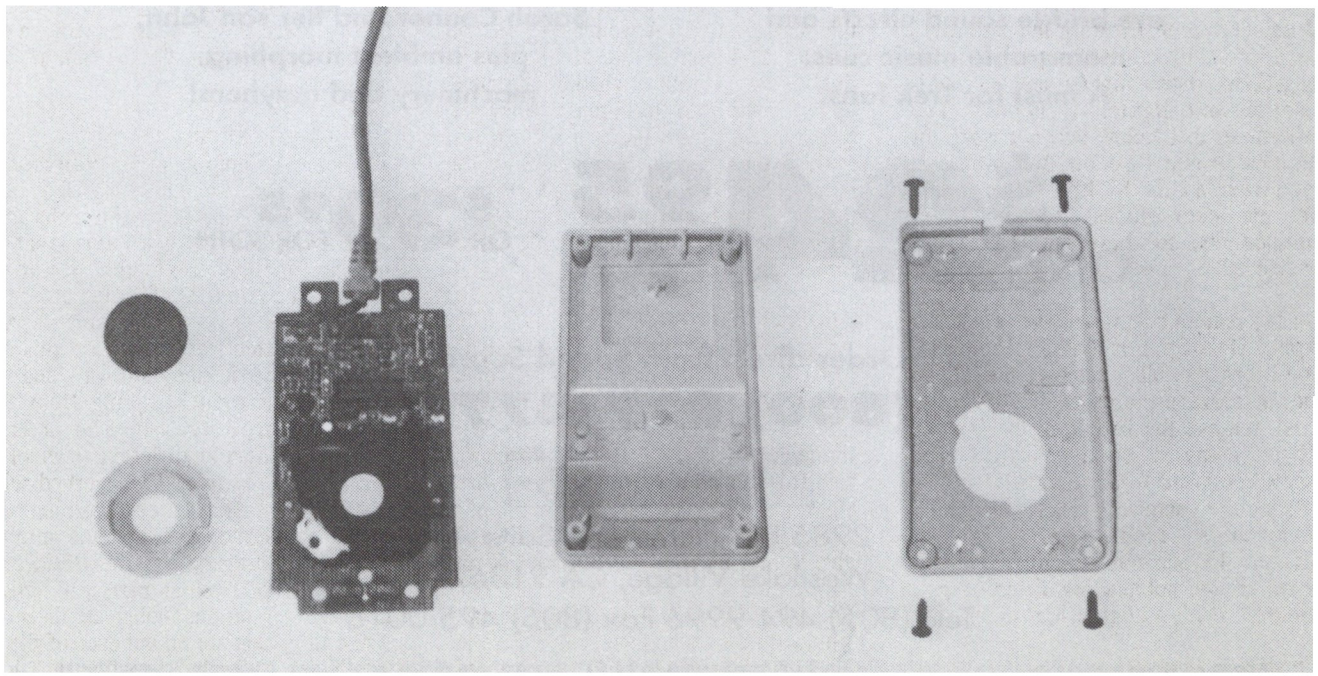


Photo 1

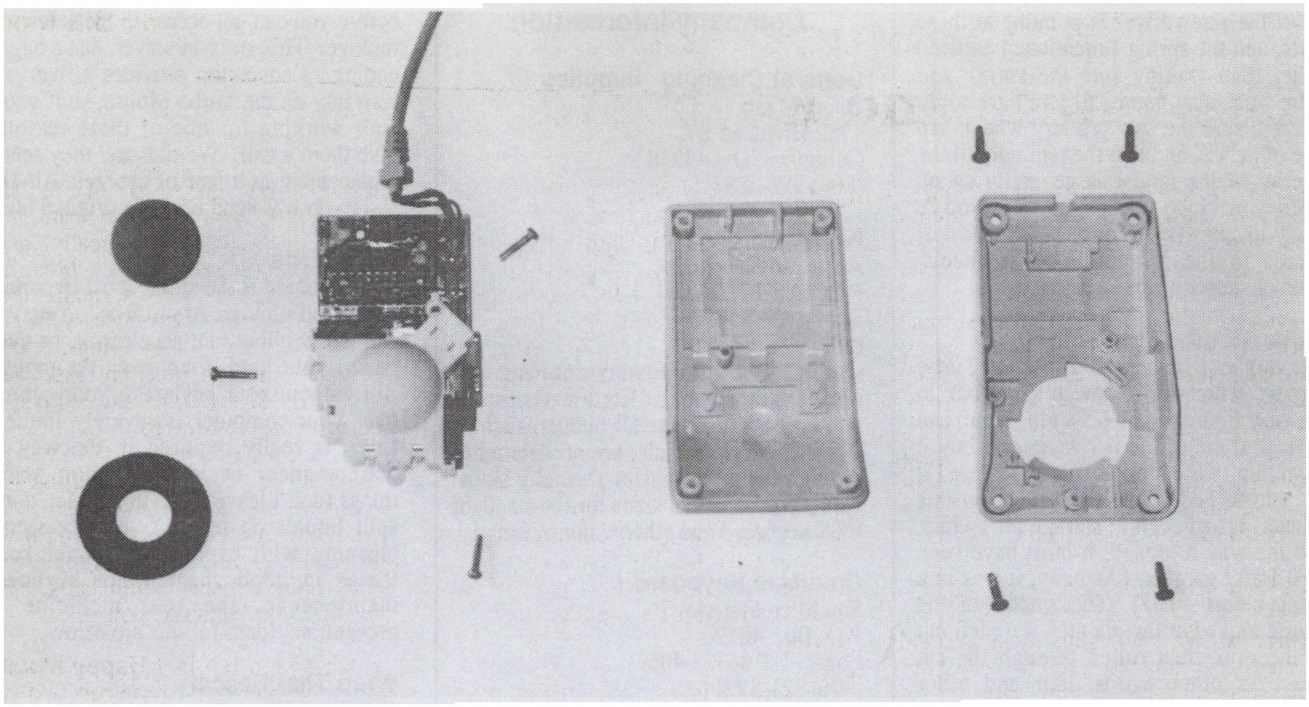


Photo 2

this will determine what needs to be cleaned. Flip it over onto its back (with the button facing down.) Now look at the mouse ball. If it's black, and/or the serial number of your mouse begins with "LT", your Apple mouse was made by LogiTech (a famous mouse-maker in the PC world.) If you have one of these, your job is easy. If the ball is grayish colored, then Apple itself made your mouse, and you have a few more things to be aware of, and some small parts you must insure do *not* get loose. (Trust me, I learned the hard way.) In a side by side comparison, the LogiTech mouse is lighter, and the ball is smaller and lighter. (Note: The procedures that follow *will not work* for the new Apple Desktop Bus Mouse II [reviewed in *GS+* V4.N5]. That mouse has no easy access to the inner components, so these methods aren't workable.)

On the bottom of any mouse, except the Apple Desktop Bus (ADB) Mouse II, you'll find four black screws holding your mouse together, one on each corner. First, remove the ball from the bottom. Then, using a small Phillips-head screwdriver (one from a computer tool kit or a jeweler's screwdriver set), remove the four screws. From here, the methods diverge. If your mouse is an Apple, skip down to the subheading titled "Apple Mouse." If it's a LogiTech, read on.

LogiTech Mouse

Once the screws are off the bottom, flip the mouse back over, and pull off the top. This is a very reliable model, since the ball of the mouse is less likely than other models to transfer gunk to the wheels. The internal board is a simple one-piece model, and looking it over taught me a lot about how a mouse works (see Photo 1). At any rate, the likeliest cause of any mistracking will be accumulated crud on the X-and Y-axis mouse wheels.

A thumbnail should be sufficient to chisel this nastiness off. After making sure all accumulated dirt is out of the mouse, dunk a cotton swab in alcohol and clean all three wheels to finish the cleaning and help prevent future build-up. Then just reverse the process to reassemble the mouse. Of the three types of ADB mice that I'm familiar with (not counting the ADB Mouse II), this model is the easiest for me to clean.

Apple Mouse

Apple themselves manufactured two types of ADB mice. The first model they made was sold with some of the very early models of the IIGS (such as the Woz limited edition). The second model was sold from about 1990 on. (The one that I worked with came with a friend's Mac SE/30 that he bought in 1990.) I wasn't able to get any specific information from Apple, but I believe that most *GS+* Magazine readers will have either an early Apple or LogiTech model, since these are the two types of mice that I have seen provided with the IIGS.

Early Apple Mouse

This mouse, like the LogiTech model, is a one-piece board (see Photo 2). Unlike the other Apple model, there are no internal parts that can come loose. A basic cleaning of the wheels and ensuring that the rest of the interior is clean (as described for the LogiTech mouse, above) should be sufficient to keep everything in working order. When taking this mouse apart, you'll have to remove three screws from the white assembly that holds the ball in place if you want to remove the circuit board from the bottom of the mouse.

Later Apple Mouse

The internal setup of this mouse is a bit different from the LogiTech and early Apple model. On this mouse, the third "stabilizing" wheel has a spring behind it that can, and *will*, get loose if you're not careful (see Photo 3). (On the other two models, this spring is enclosed where it cannot get free.) Trust me on this one folks, I found out the hard way, and had to get a replacement spring from Sun Microsystems. This mouse's internal layout is radically different from other types of Apple mice I've worked with. You must be more careful working with this type of mouse, since the internal components are more fragile. Besides the spring, two other small parts you have to keep up with on this mouse are the small white rings that are on the ends of the X- and Y-axis "wheels" (actually, they look like rolling pins to me). (In Photo 3, the

tip of the screwdriver is pointing at these parts, and the spring I mentioned earlier.) Other than making sure the spring and these rings stay home, all you have to do is make sure the two primary wheels are free of debris, and that the reminder of the interior of the mouse is generally clean. Then you close it back up, and you're ready to go! This mouse has the easiest access to the X- and Y-axis wheels, making simple cleaning easier.

Turbo Mouse

Diz dug out his old Kensington Turbo Mouse (which he reviewed way back in the very first issue of *GS+* Magazine) and gave it to me to see if I wanted to buy it from him. One look at it, and I knew I'd be able to add a few paragraphs to this article. It had been in storage for awhile, and the way it looked, it must have been in a drafty garage. [Actually, it was in a damp cellar - Diz] The wheels of the mouse looked as though they were left out in the rain, then rolled through the cat box. In other words, hair and other unmentionables were everywhere throughout the innards of the thing. With *much* effort, I was able to get everything fairly clean. However, due to the accumulated dirt and rust on the metal wheels of the Turbo Mouse, it refused to track correctly. So, the moral of the story is: clean your Turbo Mouse thoroughly before putting it into storage, and when you store it, put it in a plastic bag. If it's the same type as the one Diz has, you'll have to remove the label on the bottom before you can get access to the screws to remove. This story however, has a happy ending. Kensington provides a five-year warranty on the Turbo Mouse, so if yours isn't working for one of these reasons, give them a call. We did, and they sent a replacement unit free of charge! All Diz had to do was send back his original unit.

Company Information

General Cleaning Supplies

Direct Micro
1782 Dividend Dr.
Columbus, OH 43228
(800) 288-2887

Keyboard Skins

American Covers, Inc.
P.O. Box 1796
Sandy, UT 84091
(800) 228-8987
(Note: American Covers does not sell directly to the public. Certificates can be purchased at major retail outlets [such as Comp USA] which are redeemable through the company for specialty skins. Direct Micro stocks skins for the standard IIGS keyboard and other major models.)

OmniMac Keyboard

Sun Microsystems
P.O. Box 4059
Logan, UT 84323-4059
(800) 821-3221

Turbo Mouse ADB

Kensington Microware Limited
2855 Campus Drive
San Mateo, CA 94403
(800) 535-4242
(415) 572-2700
Fax: (415) 572-9675

Keyboards

The keyboard is the single most important peripheral on your Apple IIGS. Yes, you can live without that accelerator, or even (gasp) your hard drive, even the mouse. But without your keyboard, your control over your computer is severely limited. Little is really required in the way of maintenance, besides common sense things (don't leave it out in the rain, don't spill liquids on it, etc.) An occasional cleaning with canned air should keep things in good shape. For keyboard maintenance, the best medicine is prevention. Ideas for this are below.

Wrap That Rascal

One thing I'd recommend if you're in the practice of "safe" computing is to purchase a form-fitting keyboard skin. (I wryly dubbed these things "keyboard condoms." One is shown on the keyboard at the top of Photo 4.) These covers stay in place while you use the keyboard, and offer much more protection if, say, you spill tea on your keyboard while you're working. (Another instance of hard-won experience on my part. This happened to my old IIe my freshman year at college,

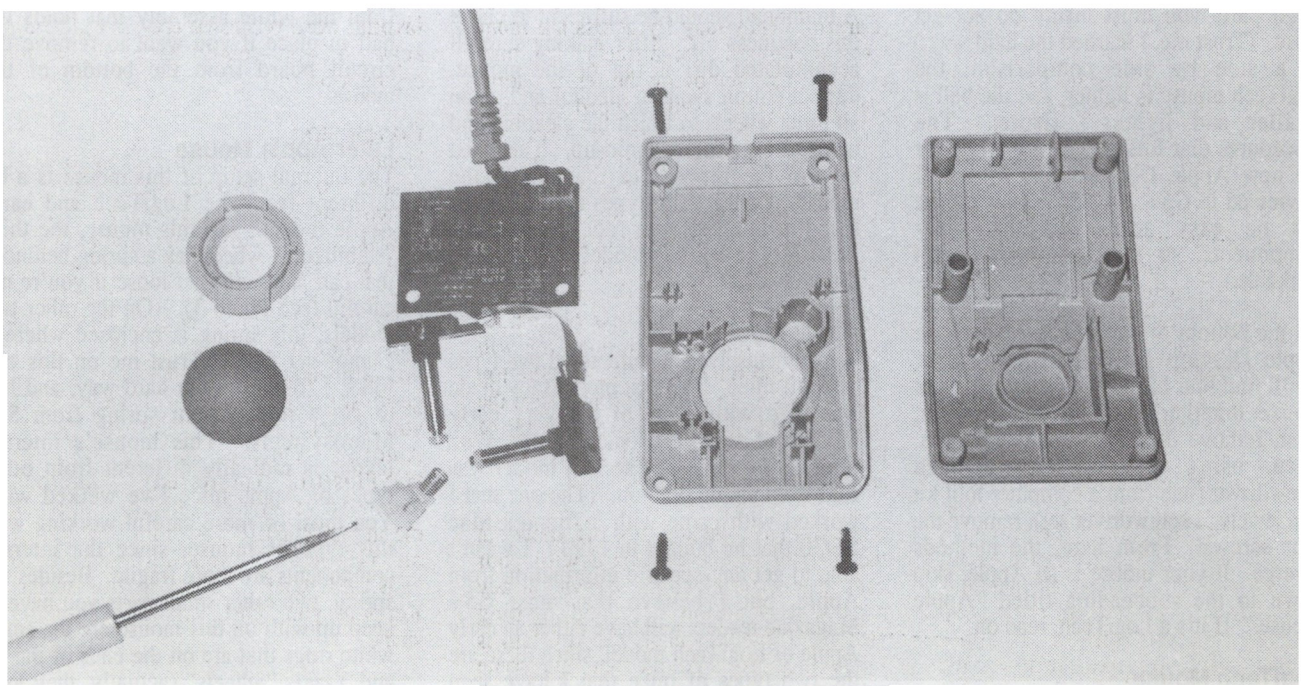


Photo 3

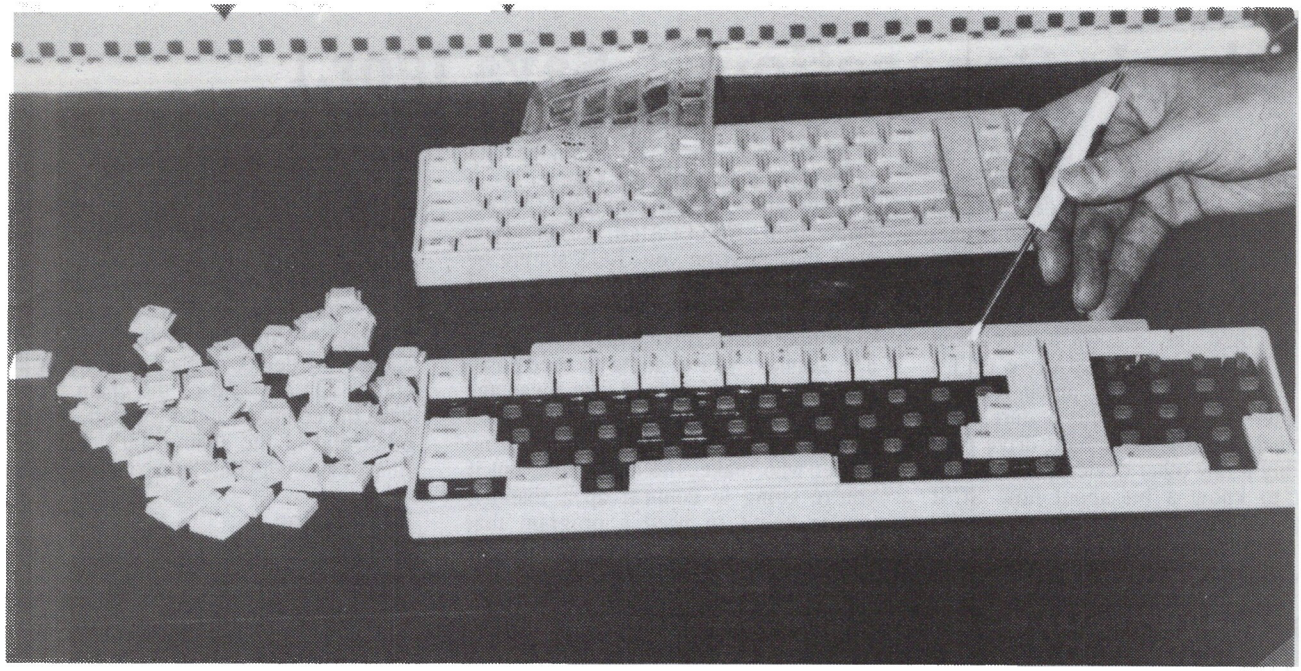


Photo 4

and the "G" key never worked right again. It also happened to my two IIGS keyboards *while working on this article*! Can you say "Murphy's Law?") Now I know some guys are going to complain that they don't get the same tactile feel from their keyboard after putting one of these on, but if you're clumsy, ask yourself this: Is a bit more feeling worth the risk?

Another benefit of these skins is that you can get laughs at the expense of your non-computer friends by telling them that it protects you from catching a computer virus. These skins are sold from several direct-mail outlets, or you can call the manufacturer (American Covers) directly. They stock skins for the standard IIGS keyboard, plus nearly any other keyboard on the planet. I called to ask about my OmniMac extended keyboard, and they had skins for all seven (!) variants of it. Contact info for these folks is in the "Company Information" sidebar.

Other preventive maintenance just boils down to shooting the keyboard from time to time with canned air. The standard IIGS keyboard comes apart fairly easily (three screws in the back are all that hold it together), but, if you're easily frightened by electronics, I don't recommend that you take the keyboard completely apart simply to clean it. All you really need is a cleaning kit (Direct Micro sells them), or you can do it yourself.

Do It Yourself!

To clean your keyboard, disconnect it from your computer, and begin taking the key caps off, one at a time. To do this, just use a small, flat head screwdriver to gently pry each key cap upwards. (Careful! They may fly across the room when they finally come free!) You may want to avoid removing the reset, return, control, space bar, shift, keypad zero, and enter keys, because these keys are extremely difficult to put back on the keyboard. Photo 4 shows a IIGS keyboard with most of its keys removed, and how to use a screwdriver to pry up a key. The reset key at the top of the keyboard, and all of the keys still remaining *below* the top row of number keys in the picture are the ones you will want to avoid removing. (We left the top row of keys on to illustrate how to use the screwdriver.) But, if you remove all of the other keys, you can easily clean around these problem keys.

After you have the key caps off, blow out the interior of the keyboard with your canned air, and clean the individual key caps with a cotton ball, and rubbing alcohol. If the area under the key caps is *really* dirty, use a cotton swab and some rubbing alcohol to clean out the gunk around the key posts. When you finish, just put the key caps back into place and your keyboard should be as good as new! (By the way, if you take *all* the key caps off of your keyboard, you may have trouble remembering where they go when you try to put them back on. Don't panic! Simply borrow a friend's keyboard to see where all the keys should go. Or, if you can't do that, just crank up your favorite word processor and start pressing keys. As you identify each key, put its cap back on.)

Conclusion

Hopefully, that's enough information to enable you to keep your input peripherals in working order. If you have a stock IIGS keyboard and a LogiTech mouse, I feel you simply need a mouse pad, a keyboard skin, and some canned air to keep everything going in good shape. For those (like me) who don't exactly have this arrangement, I hope I've given you a good starting point. If I haven't, or you're lost, gimme a shout online. On America Online, E-Mail me at "GSPlusBill" (preferred). Internet, CompuServe, and Delphi folk can reach me at "GSPlusBill@aol.com". If you're on GEnie, try sending E-mail to "BILL.MOORE". Next in this series: Keeping your CPU and drives in top shape. *GS+*

SCSI ("*Simple* Connections," Says Igor.)

By Josef W. "Igor" Wankerl

OK, so after you read the "So You Bought A Hard Disk . . . Now What?" article from last time, you decided that you really needed a hard drive and bought one. Or, perhaps, you already had a hard drive and learned how to manage partitioning and whatnot. So what now? Maybe you'd like to know a little about SCSI. You say your hard drive isn't a SCSI device? Well so much for that thought—you can skip this feature. But if you do have a SCSI hard drive (and possibly a few other devices) then you'll want to know a bit about how SCSI actually works. Well, not the down and dirty details, but just some simple stuff that everybody should know.

SCSI

First off, SCSI stands for "Small Computer Systems Interface" (sometimes also called "Small Computer Standard Interface"). Even though you now know what SCSI stands for, the name may not be clear on what SCSI actually is. SCSI is simply a set of rules that hard drives (and other peripherals) and interface cards follow. If you have a peripheral which follows the SCSI guidelines, you should be able to use it on *any* computer which has a SCSI interface card. If you like our "Scavenger" series of articles, you'll love SCSI devices since you can take any SCSI device (hard drive, scanner, etc.) which is advertised for any other computer (Mac, IBM, NeXT, Atari, Commodore, etc.) and use it on your IIGS simply by having the correct cable and a SCSI interface card. Of course if you have something which is not a hard drive, such as a scanner, you're going to need some kind of driver software to take advantage of it. Normally interface cards come set so you can hook hard drives up to it no matter who makes the hard drive, but if you're going to connect up a scanner, you're going to need a program that knows how access the scanner and interpret the data that it will return.

Cables

Once you have a SCSI device, the real trick is finding the correct SCSI cable. Most current SCSI devices use 50-pin, centronics-style connectors. Some older SCSI devices will use a 25-pin D-style connector. The SCSI specifications require a 50-pin cable, but half of the pins are ground wires, so a 25-pin cable is actually OK, however the 50-pin style is preferred. From this information, you can see that there are three common kinds of cables which you can find: 50 to 50, 25 to 50, 25 to 25 (see Photo 1).

Chains

One of the neatest things about SCSI devices is that you can hook up seven devices to one controller card. To do this, you daisy-chain them together (see Photo 2). Daisy-chaining requires each SCSI device to have two SCSI interface ports. To daisy-chain devices, you simply hook each SCSI device to the next one in the chain. On one end of the chain, you'll have the computer interface card. On the other end of the chain, you'll have the final device with only one connection.

Termination

Like all computer equipment, SCSI devices communicate with each other using electrical signals. When these signals come to the beginning or end of the chain of SCSI devices, they need to be stopped, or they can "bounce back" to the other end of the chain and confuse the other SCSI devices. The job of a SCSI terminator is to stop those signals before they bounce back. Therefore, both the first and last device in a SCSI chain should have terminators. Devices in the middle of the chain should *not* have terminators. (See Photo 3).

The SCSI interface card itself is considered a SCSI device, so it must be

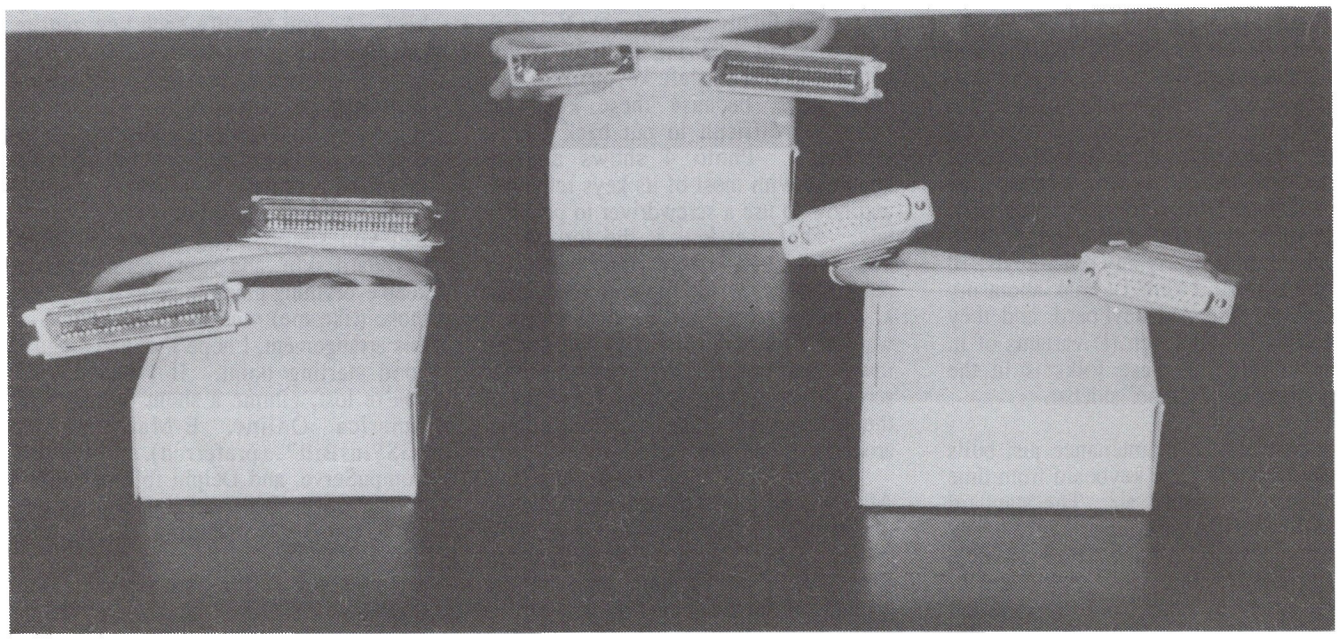


Photo 1 – Some common SCSI cables: 50 to 50 (left), 25 to 50 (middle), and 25 to 25 (right)

terminated. Most SCSI interface cards have a built-in terminator so there is no need to terminate the interface card end of the SCSI chain. However, some interfaces (the interface built into Macintosh PowerBook computers springs instantly to mind) aren't terminated and require external termination. The best way to tell if an interface card is internally terminated is to check the manual that came with it. To terminate an interface card you need a special kind of terminator called a pass-through terminator. A pass-through terminator is one where you can connect one end of the cable to the device you want to terminate and instead of attaching the other end of the cable to a SCSI device, you instead connect it to the pass-through terminator, which then terminates that end of the chain. The pass-through terminator has two connection ends on it, and you connect the free end to the first device in the SCSI chain.

Some SCSI devices are internally terminated (i.e. the terminator is inside the device case) while others require an external terminator to be attached to one of the device's external SCSI ports. The best way to tell if a device is internally or externally terminated is to check the manual that came with it.

Removing Internal Termination

If you don't like your SCSI device to be terminated, it's usually fairly easy to remove the internal termination. The most common form of internal termination is with resistor packs. If you're not squeamish about taking your SCSI device apart, you can usually spot the resistor packs on a circuit board (they normally come in sets of three and are either yellow or black—see Photo 3 for an example) and pull them out if you so desire. Yanking out the resistors commonly requires the use of needle-nosed pliers: just grab the resistor pack with the pliers and pull *straight* up to keep the pins on the bottom of the resistor pack from bending. I, personally, desire to have external termination simply because it's easier for me to move all my equipment around—you don't have to worry about the device being internally terminated, all you have to check is the external terminators at both ends of the chain. If you aren't sure what you're doing, contact the manufacturer of your SCSI device and see if they'll give you help in removing the internal termination.

IDs

Being able to hook up to seven devices to one interface card is great! In order for this trick to work, though, each device is given a unique ID in the range of 0 to 7. (Yes, that's eight numbers, but one of the device numbers is used for the interface card—remember the interface card is considered a device itself.) SCSI devices allow you to set the ID in different ways—some use dip switches, some use pinwheels, some use pushbuttons. No matter how they do it, no two devices on a SCSI chain can have the same ID. Also, the order of the IDs on the daisy chain doesn't matter, which means that the chain can look like 1, 2, 3 or it can look like 6, 4, 1. As long as each device has a unique ID, your SCSI chain will function properly.

In addition to keeping the devices from being confused with each other on the chain, the SCSI ID also plays another useful role: it tells the computer in which order to look at the devices. The highest numbered device is the first device looked at, the lowest numbered device is the last device looked at. For instance, if you had three hard drives on a SCSI chain (call them A, B, and C) and you wanted to boot from drive B, just make sure that the B drive has the highest SCSI ID. Remember that it doesn't matter where the drive is physically in the SCSI chain—as long as it has the highest ID then it will be the boot device.

Walk This Way, Igor . . .

Congratulations—you're now qualified to talk about SCSI like the rest of us who have nothing better to do than sit around at home and figure all this stuff out the hard way. If you like, send in $15, a recent passport sized photo, and a self-addressed stamped envelope, and we'll send you back your diploma and a certification card. [He's kidding folks.-Ed.] Now if any of this SCSI information is a bit over your head, write in and let me know! I'll be more than happy to answer any questions. ***GS+***

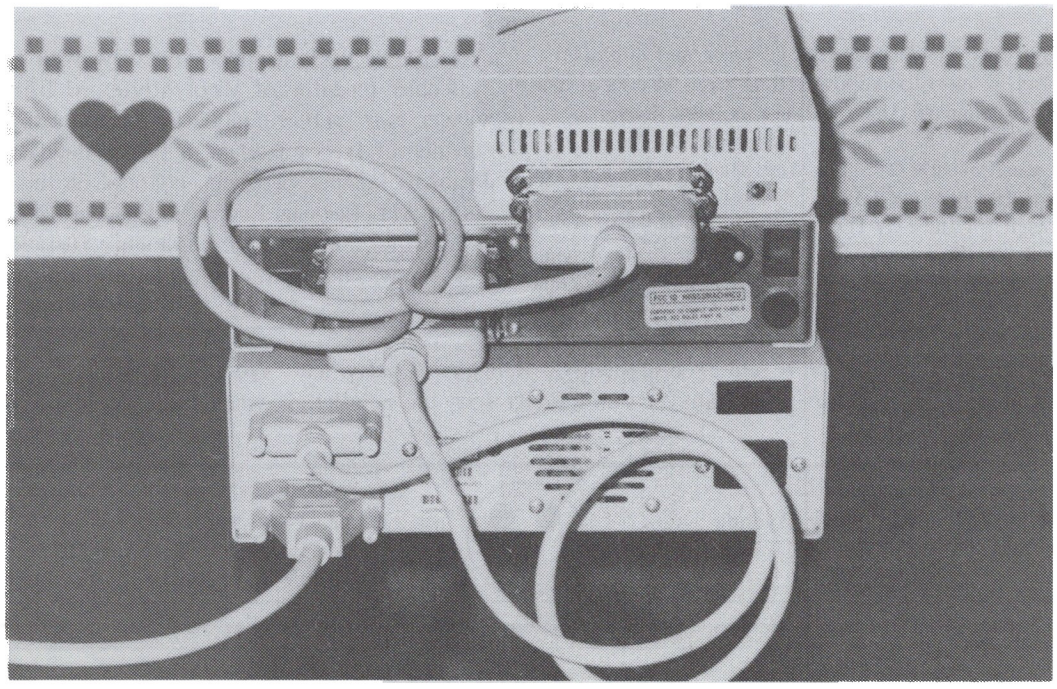


Photo 2 – Daisy-chained hard drives

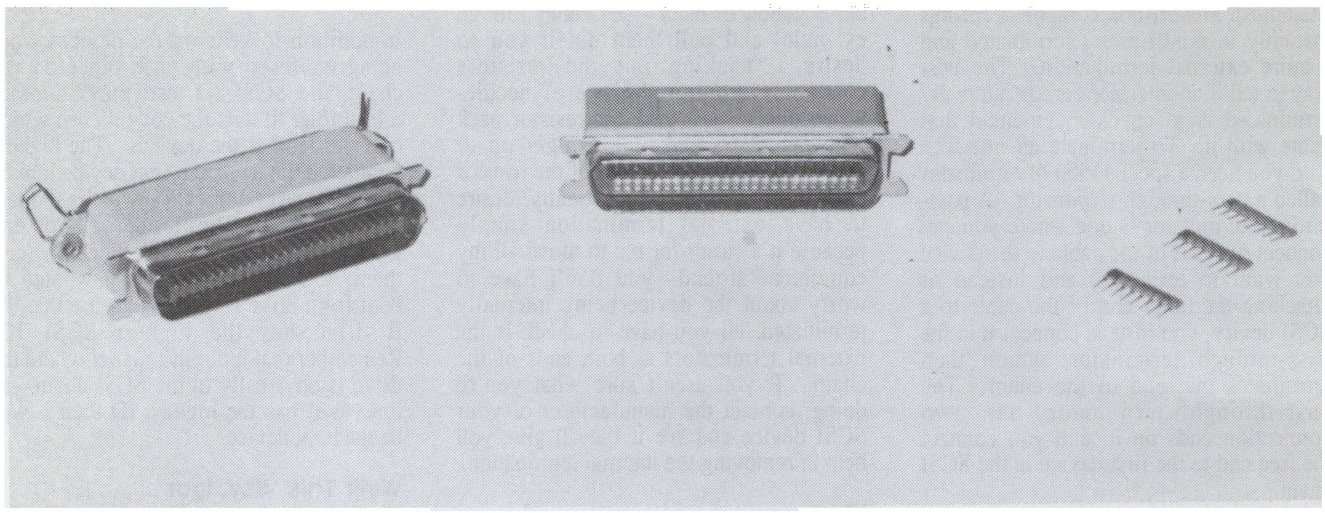


Photo 3 – A pass-through terminator (left), a regular terminator (middle), and resistor packs (right)

What did you *miss* in the last Pegasoft Newsletter?

PROGRAMS

DrawTools 3.1: All-assembly graphics and animation toolset, & more pixie-power than ever. Works in almost any GS language. Used in Tresures from Heaven.

Pegasus Pascal 2.0	The difinitive IIGS language
Pegasoft's Jukebox 1.3	Plays music to patterns
Thought for the Day 1.0	Good with morning coffee
Quest for the Hoard 1.1	The classic strategy game
Treasures from Heaven 1.1.1	Breath-taking piling game

FEATURES

Software update news, interview with Steve Brunier (creator of Micol Advanced BASIC), "viewer mail", IIGS multifinder compatibility chart, winner of free software, a brand new contest, Pegasoft Partner program, editorial on the fall on the AII, Pegasus Pascal Strings unit tutorial, Pegasoft's fall software catalogue, TurboRez GS news, and a few other bits & bytes.

The Pegasoft Newsletter is sent free to owners of Pegasoft software. We believe in keeping our customers informed and up-to-date. If you haven't seen the newsletter, write for a trial issue today.

Pegasoft™
R. R. #1, Honsberger Avenue
Jordan Station, Ontario, Canada
L0R 1S0

Canadian orders: we eat the PST & GST.
Phone: 1-905-562-4267.
Support low-cost, quality Apple IIGS software.
We don't have to be crazy, but it helps

CD-ROaM

By Steven W. Disbrow

If your IIGS has a CD-ROM drive attached to it, you've probably run across at least one or two CDs that the IIGS simply will *not* recognize. If you have, CD-ROaM may be just what you need to get some use out of those disc's.

Not For CDs Only!

Before we get into how to actually use CD-ROaM, let me point out that you do *not* need to have a CD-ROM drive to use it! While CD-ROaM *was* specifically created to overcome a problem that only CD-ROM drive owners will ever have, it is also a general file-copying utility that will work with *any* IIGS disk. So, having said that, let's talk a little about *why* your IIGS won't recognize some CD-ROMs.

The Problem

You see, it seems that there is a tiny flaw in the File System Translator that the IIGS uses to access CD-ROMs that are formatted with either, the High Sierra, or ISO 9660 file systems. That flaw is this: If the name of the disc has *any* spaces in it, the FST will *not* recognize the disc! This means that the disc will *not* show up on the Finder desktop, and you won't be able to access *any* of its files. So, for example, if you have a High Sierra or ISO 9660 disc with the name "**:Freds Disk**", your IIGS won't recognize it.

The Solution

So, how does CD-ROaM get around this problem? Well, you see, GS/OS allows you to reference disks in several different ways. However, most applications, and most parts of the System Software only do it one way: by using the actual name of the disk. (We techie types call this the "volume name.") This is where the bug in the FST comes in—it sees the spaces in the name of the disc, thinks that they shouldn't be there and refuses to recognize the disc.

Fortunately, GS/OS also assigns a name to, and, more importantly, lets you reference, the actual *device* that the disk is in. So, instead of using the volume name to get at the contents of a disc, CD-ROaM uses the *device name*. A device name will *never* have spaces in it so the FST will let it go through without a second thought. So, that's what CD-ROaM does: If the disk in question is a High Sierra or ISO 9660 disc, it automatically uses the device name to access the data on the disc. This means that CD-ROaM can navigate the contents of those CD-ROMs just like any other disk! Of course, outside of CD-ROaM, you still won't be able to access these disks, so, beyond simply giving you access, the main purpose of CD-ROaM is to copy files off of these discs so that you can use them from your other IIGS applications.

The CD-ROaM Interface

First and foremost, CD-ROaM isn't the Finder. In fact, it's just a single window with a *lot* of controls in it (see screen shot). There's not even that much interesting stuff in the menu bar! So, we'll save the discussion of the menu bar for later. Right now, we need to take a detailed look at all of those controls in the CD-ROaM window.

Two Lists

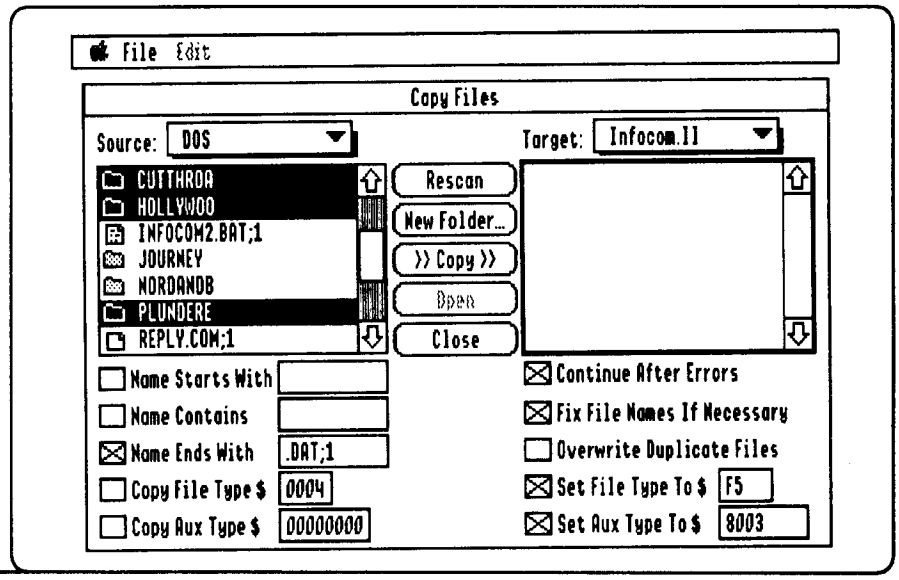
When you first start up CD-ROaM, the Copy Files window will automatically open. At the top of this window you will see two pop-up menus and two lists. The pop-up menu and list on the left side of the window are used to select the files and folders that you want to copy. (This is called the "source file" or "source" list.) The pop-up menu and list on the right side of the window allow you to select the folder that you want those files to be copied to. (This is called the "target folder" or "target" list.) These lists and menus work in a fashion that is very similar to the way Standard File dialogs work—the lists show you the files that are in the current folder, and the pop-up menus allow you to move from the current folder to one of its parent folders.

When the Copy Files window first appears, each list will be showing a list of the disks that are currently available. It's important to note that the source list shows *all* of your available disks, while the target list only shows the disks that aren't write protected. So, if you have a CD-ROM online, it will show up in the source list, but it *won't* show up in the target list.

To open a disk (from either list) simply double-click on it in the list. The disk will be opened, and the files on the disk will be displayed in the list. The pop-up menu above the list will change to show the name of the disk that you are currently looking at. Again, the lists in CD-ROaM work almost exactly like the file lists in a Standard File dialog. When you open a folder, CD-ROaM will show you the contents of that folder, and the name of the folder will be added to the pop-up menu. If you wish to move back to a folder you were previously in, simply select it from the pop-up menu. If you wish to move back to the list of disks, simply select "Disks" from the pop-up menu, and you will once again be presented with the list of disks that are on line. (Note that this version of CD-ROaM does *not* automatically detect when you insert or remove a disk. To make CD-ROaM recognize a change in the disks that are available, simply select the "Disks" item to force CD-ROaM to rebuild its list of disks.)

Dimmed Files

When you are listing the contents of High Sierra or ISO 9660 discs, you may notice that the files or folders with spaces in their names are dimmed out, so that you cannot select them. This is due to the FST problem that I discussed earlier: The spaces in the names of these items make it impossible for you to copy them off of



these discs. So, CD-ROaM simply dims them out to let you know that you shouldn't even try to copy them. Unfortunately, there is, at this time, no way around this part of the problem.

The Current List

Between the two lists are five buttons. You use these buttons to perform various operations on the two lists. However, these buttons are activated or deactivated depending on the list that is currently selected. For example, if the target folder list is currently selected, then the New Folder button will be active. However, if the source file list is selected, the New Folder button will be dimmed. You can tell which list is selected by looking at the border of the list. The list with the thick border around it is the currently selected list. In the screen shot, for example, the target list is the selected list, so whatever actions you take will affect the files in the target list, and not the source file list. To change the currently selected list, simply click on the list you wish to work with, or press the Tab key to move to the next control.

The Buttons

Now let's look at each of the five buttons:

Rescan - The Rescan button allows you to re-list the contents of the current folder. This is handy if you have used a desk accessory to make a change (like deleting files) to the currently displayed folder. If an error occurs during the rescan, the list of disks will be displayed instead. The rescan button works with both lists, but it is available only when you are listing files (not disks) in the current list.

New Folder - The New Folder button allows you to create a new folder on the target disk. When you click the New Folder button, a dialog will appear asking for the name of the folder you wish to create. Simply type in the name you wish to use, and then click on the Create button. CD-ROaM will create the new folder and open it for you. The New Folder button is available only when the target folder list is the currently selected list, and only when you're listing files (not disks).

Copy - This button actually starts the process of copying the files that you have selected. The Copy button is available only when you have some files selected for copying, and when you have a disk or folder open to copy them to. In other words, if either list is showing disks, the Copy button won't be available.

Open - Clicking on this button opens the currently selected folder or disk. This button works with both the source and target lists.

Close - This button closes the current folder in the currently selected list. If you are in the root directory of a disk, clicking on the Close button will redisplay the list of disks that are available.

But There's More!

Those are just the basic controls that CD-ROaM gives you to copy files. As you can probably tell from looking at the screen shot, there are a lot more options available for you to use during the copy process. These options are represented by the check boxes that you see below the source and target lists. To turn an option on or off, simply click on the check box next to its name. These options come in two types: source filters, and target write operations.

Source Filters

The source filters are the options that are underneath the source list. These source filters allow you to control which files will actually be copied out of the files and folders that you have selected from the source list. In other words, these options don't actually *select* files for you, they merely decide which files to copy, out of all the files that *you* select.

Another important point to note is that CD-ROaM treats folders as sacred objects—folders are *always* copied onto the target disk regardless of the source filters that you use!

Now, lets look at each source filter and see what it does:

Name Starts With - When you check this option, CD-ROaM will only copy those files that begin with the characters you specify in the line edit box. Note that this option *is* case sensitive.

Name Contains - When you check this option, CD-ROaM will copy any file whose name contains the characters that you specify in the line edit box. Note that this option *is* case sensitive.

Name Ends With - When you check this option, CD-ROaM will copy any file whose name ends with the characters that you specify in the line edit box. Note that this option *is* case sensitive.

Copy File Type - When you check this option, CD-ROaM will only copy files that have the file type you specify in the line edit box. You must specify the file type in hexadecimal. CD-ROaM will only let you type valid hexadecimal characters into the line edit box. If you don't know the hexadecimal file type of a file, CD-ROaM gives you an easy way to find it, simply select the file in the source or target list, and then pick the Info item from the file menu. A dialog will appear showing you the file type, auxiliary type, and the number of bytes the file takes up on disk. You can then use this information to fill in the file type and aux type (see below) options.

Copy Aux Type - When you check this option, CD-ROaM will only copy files that have the auxiliary type you specify in the line edit box. You must specify the auxiliary type in hexadecimal. CD-ROaM will only let you type valid hexadecimal characters into the line edit box. If you don't know the hexadecimal auxiliary type of a file, you can use the Info item in the file menu to find out what it is.

Target Write Options

The target write options are the check boxes that appear under the target list. While the source filters allow you to copy only specific files, the target write options are applied to *every* file (except folders) that actually gets copied. These options are:

Continue After Errors - If you are copying files in the Finder and an error occurs, the Finder will report the error and abort the remainder of the copy operation. This can be an extreme pain in the butt. CD-ROaM however does not have to work this way. If this option is checked, CD-ROaM will report any errors it encounters while copying files, but it will then *continue* copying the remainder of the files! If this option is not checked, CD-ROaM will report the error, and then abort the remainder of the copy operation.

Fix File Names If Necessary - When copying files between disks using different file systems, the name of a source file may not be a valid name on the target disk. If this option is checked, CD-ROaM will automatically check the names of the files (and folders) that you are copying to make sure they are valid for the target disk. If they are not valid, CD-ROaM will fix them as they are copied. If this option is not checked, CD-ROaM will tell you that the name is invalid and will show you a valid name that you might use. You can tell CD-ROaM to either use the new name, skip the file, or cancel the copy operation completely. (This version of CD-ROaM does not allow you to edit the new name.)

Overwrite Duplicate Files - If the file you are copying already exists, checking this option will tell CD-ROaM to automatically delete the old copy before

writing out a new one. If this option is not checked, CD-ROaM will tell you that the file already exists, and you can then decide if you want to replace the old file, skip copying this file, or cancel the copy operation completely.

Set File Type To & Set Aux Type To - When copying files from a CD-ROM, a lot of the files on the CD will probably have a file type and auxiliary type of $0 or "unknown." So, after you move them to one of your other disks, you will probably want to change their file and auxiliary types to something that your other IIGS programs will be able to more easily use. To simplify this process, CD-ROaM lets you make this change *as you copy the files*! Simply check this option and type in the file type that you would like the files to have. As the files are copied, CD-ROaM will change the file and auxiliary type to the values you have specified.

Working Together

Before we look at an example of how to use these options, it is important to note that all of these options, both the source filters and target write options can be used *independently* of each other. For example, you could, if you want, copy only files that start with the characters "•Z", end with the characters "™®" and have a file type of "5A". And, you could specify that these files be written out with the file type "2B" and the auxiliary type "7F".

An Example

Now, lets look at a practical example using a real product: the Lost Treasures of Infocom, Volume II. This CD-ROM contains both PC and Macintosh versions of 11 Infocom Games. Using the interpreters included with the IIGS version of The Lost Treasures of Infocom, Volume 1 (see review in *GS+* V4.N6), you can play these games on your IIGS. Unfortunately, the name of this CD-ROM is "**:LOST TREASURES II**", so the Finder can't get to any of the files that are on it. Fortunately, CD-ROaM can.

When you open this disk with CD-ROaM, you will notice that there are two folders: **DOS** and **MAC**. If you open the **MAC** folder, you will see that lots of the item in it are dimmed out. This is because these items have spaces in their names. So, sadly, you won't be able to copy a lot of the files out of the **MAC** folder.

The **DOS** folder however, is a very different story. Opening the **DOS** folder reveals a bunch of different folders, each one containing a different game. Opening any one of these folders reveals five different files, only one of which you are interested in: The file that ends with "**.DAT;1**". This is the file that contains the actual game data that the Infocom interpreter uses to play that particular game. So, all we really need to copy off of the CD is the "**.DAT;1**" file for each game.

However, that isn't all we need to do to be able to use these data files. We also need to set the file and auxiliary type of the data files so that the Infocom interpreter will recognize them. The file type is always $F5, but the auxiliary type is a bit trickier. You see, each game uses a different version of the Infocom interpreter. The version that a particular game requires is specified in the auxiliary type of the data file for that game. So, for example, if the auxiliary type of a data file is $00008003, it means that this particular game requires version three of the Infocom interpreter. (Note that the "3" is the actual interpreter version, but the "8" is also required in the auxiliary type.) Normally, you would have to find the correct auxiliary type by trial and error, but, in the "Letters" column of the last issue of *GS+* Magazine we printed a listing of the correct interpreter versions used by each game on the Lost Treasures of Infocom, Volume II disc, so you can just refer to that instead. In this example, we'll just look at how to copy the version three games. The version three games are: Cutthroats, Hollywood Hijinx, Plundered Hearts, Seastalker, and Wishbringer. So, open up the **DOS** folder on the CD-ROM, and select the following folders: **CUTTHROA**, **HOLLYWOO**, **PLUNDERE**, **SEASTALK**, and **WISHBRIN**.

Next, move to the target list, and open a disk to copy these games to. Make sure you have plenty of free space, because each of the data files we are about to copy takes up about 200K!

Next, turn on the Name Ends With option, and type the characters "**.DAT;1**" into the line edit box that goes with this option. Make sure that you type in all UPPERCASE letters!

Now, turn on the Set File Type To option, and type "F5" into the line edit box that goes with it.

Then, turn on the Set Aux Type To option, and type "8003" into the line edit box that goes with it.

Finally, click on the Copy button, and CD-ROaM will begin to copy the files. Notice that the progress window shows that all of the files that *don't* end with "**.DAT;1**" are skipped! When CD-ROaM finishes copying the files, you should have only the data files, with the correct file and auxiliary types, completely ready to run from their own folders!

The Menu Bar

Now that you've seen how powerful the copying options of CD-ROaM are, we need to back up a bit and talk about the CD-ROaM menu bar. As I said earlier, there really isn't all that much stuff in the CD-ROaM menu bar, but what is there can make your work with CD-ROaM a bit easier.

The File Menu

The File menu contains only three items:

Close - This item closes the topmost window. Note however, that it will *not* let you close the Copy Files window.

Info - Selecting this item will give you the file and auxiliary type of any item that you have selected in either the source or target list. This is an easy way to determine what numbers you need to use with the options in the Copy Files window.

Quit - Selecting this item quits CD-ROaM and returns you to the previous application.

The Edit Menu

The Edit menu contains the usual assortment of items: Copy, Paste, etc. But, these are for use only by New Desk Accessories. However, there is one extra item, that is used by CD-ROaM:

Select All - This item allows you to select all of the items in the source files list. This item is only available if the source list is the currently selected list, and only if it is listing files (not disks).

The End

Well, I hope not. I originally had a *lot* more features planned for CD-ROaM, but I simply ran out of time. Hopefully, enough of you will find CD-ROaM so useful, that you'll want me to add some neat new features to it.

Until then, I think you'll find CD-ROaM to be one of the most useful and flexible file copy utilities you've ever used. And, if you have a CD-ROM drive, I think you'll find CD-ROaM to be an invaluable tool for scavenging files from CDs that you simply couldn't use before! *GS+*

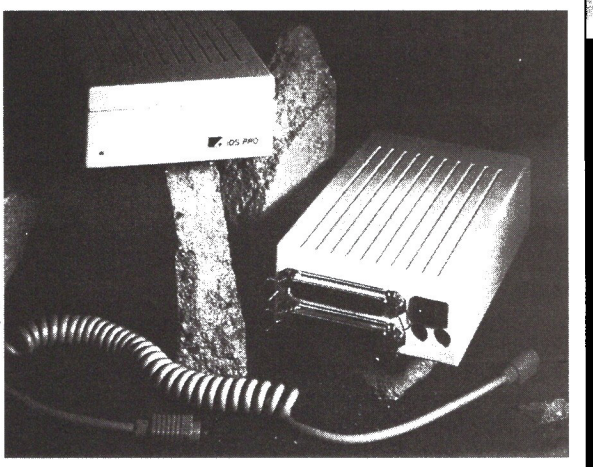
HARD DRIVES

Our NCS Pro SCSI Hard Disk drives have all of these great features:

- ***2 year warranty (Quantum Mechanisms)***
- ***High impact ABS case (not flimsy plastic material)***
- *Dual SCSI connectors for easy daisy-chaining*
- ***No "SCSI-Tee" or "pass-through" cables required!***
- *Access indicator light*
- *Convenient power connector and on/off switch*
- *Termination accessible via access door*
- *External SCSI ID selector*

We also include the latest System Software for your Apple IIgs. You also get 30+ megs. of shareware and utilities at your disposal. Works great for other Apples too.

And if you're still not satisfied, just return the drive by taking advantage of our no-hassle return policy. You'll receive a full refund (less shipping and handling) and service with a smile.



NCS Pro Drives

42mb. Q ELS	**$169**
105mb. Q LPS	**$209**
127mb. Q ELS	**$259**
170mb. Q ELS	**$279**
240mb. Q LPS	**$319**
525mb. Q LPS	**$699**
1225mb.Q PRO	**$1,099**

NCS Pro Removable Drives

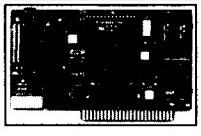
NCS Pro R44mb. $428
44mb. Syquest Removable Drive

NCS Pro R88mb. $558
44mb. / 88mb. Read and Write

All removable drives include one cartridge.
Extra 44 / 88 carts are $68 / $108

HARD DRIVE INTERFACES

SEQUENTIAL SYSTEMS



RamFast SCSI Card

The RamFast is the most powerful SCSI interface available for the Apple IIgs Computer. It features expandable Cache, and upgradable ROM support. All previous C.V. Tech RamFasts will be serviced and supported through Sequential Systems.

RamFast GS v3.01

w/256k Rev.D **$129 / $139**
w/1mb.Rev.D **$179 / $189**
(with hard drive / without hard drive)

RamFast v3.01 Upgrade (for current RF users) Rev. C or D $15

TRADE-IN YOUR APPLE SCSI CARD FOR A RAMFAST SCSI CARD, CALL FOR DETAILS!

APPLE
High Speed SCSI Card $99
$109 without hard drive purchase

Sequential Systems

RAM GS

(4megs/GS) $105*
**$115 without any other purchase*

- ***4MB. ON BOARD FOR IIGS***
- ***100% DMA COMPATABLITY***
- ***INCLUDES DIAGNOSTIC UTILITIES DISK***

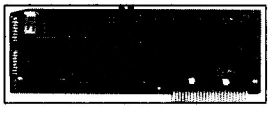
PaceMark IIgs SuperRam IV $95*
4mb. ram card for IIgs - 100% compatable!
**105 without any other purchase*

SEIKO DATA WATCH SPECIAL!

Put the scheduling power of your Apple II on your wrist. Allows you to keep daily details, appointments all on your wrist. Uses the easy to use Time-Trax 23-month scheduling software. For any Apple II computer! Includes interface cable, transmitter, Silver slim-line LCD watch, software and manual.

$24.95
DELIVERED OVERNIGHT! (MOST AREAS)
$19 WITH ANY OTHER PURCHASE

ZIP ACCELERATORS



*Put your GS into the fastlane with ZIP Accelerators. Over **300%** faster with a Zip 9/32 installed. Makes your GS Finder like new!*

Zip 7mhz/8k Cache	**$135**
Zip 8mhz/16k Cache	**$174**
Zip 9mhz/32k Cache	**$225**
Zip 10mhz/64k Cache	**$399**

COMPUTER SALES

NOVUS VISA MasterCard Cards AIRBORNE EXPRESS

School and Government P.Os Accepted!

Serving the Apple II Community for over 5 Years!

THE SMALL PRINT

[illegible]

VITESSE

Quickie / Inwords Bundle.....$249

Includes Vitesse's Quickie Handscanner for the Apple II and WestCode Software InWords v1.1 OCR Software.

Quickie (separately).....$197

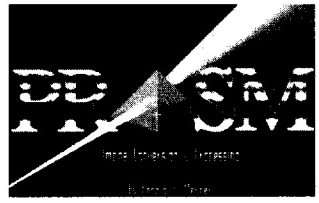
HEAVY DUTY POWER SUPPLIES

IIgs HD Power Supply $79

IIe HD Power Supply $65

NOW SHIPPING!

NEW CONCEPTS PRISM



IIGS 3200 Color Graphics Conversion Utility

*Prism is a **FAST** and **POWERFUL** graphic conversion utility which exploits your Apple IIGS' graphic capabilities. Prism allows you to load and convert images from popular graphics formats from systems like **MACINTOSH**, **PC**, **NEXT**, or **AMIGA** and save them in native Apple IIGS formats so you can use them with applications like HyperStudio, HyperCard GS, Platinum Paint, DreamGrafix, AppleWorks GS, and GraphicWriter III.*

NC Prism Graphic Conversion Program

$39.95

Applied Engineering

ÆVulcan Gold Upgrade.....$ 47
Æ 5.25" for LC or A2.....$149
AMR 5.25" for LC or A2....$119
-AMR and Æ 5.25" drives are daisy chainable !-
Æ SuperDrive.....$229
-1.44/800K 3.5" Floppy Drive for A2 & Mac
Apple SuperDrive I/F.....$138
-3.5" interface for A2 and IIgs / Req'd for 1.44mb.

Memory Upgrades

1MB SIMMs.....$46
1MB RamFast Upgrade.....$59
1MB Expansion Set (8 Chips).....$49
1MB GS-Ram III Upgrade.....$59
256k GS-RAM Ultra Upgrade.....$15
256k Apple Exp. Kit.....$18

Sequential Systems

Switch-It!.....$48.00
Switch-It! allows you to run several applications at once, and switch between them in an instant. Compatible with practically all GS/OS programs. Requires GS/OS 6.0, and 4MB for optimum performance (2MB minimum)

DREAMWORLD

DreamGrafix.....$58.00
-3200 COLOR PAINT PROGRAM FOR IIGS

ECON TECHNOLOGIES

Universe Master.....$68.00
-COMPLETE IIGS HARD DRIVE MANAGEMENT UTILITY
AutoArc.....$24.00
-NEARLY DOUBLES THE SIZE OF YOUR IIGS HARD DRIVE

Roger Wagner Publishing

HyperStudio.....$97.00
-FUN AND EASY TO LEARN HYPERMEDIA FOR THE IIGS

WestCode SOFTWARE

Pointless.....$46.00
-TRUE TYPE FONT INTERPRETER FOR IIGS
InWords.....$78.00
-ALLOWS THE QUICKIE TO SCAN IN TEXT FOR EDITING

Vitesse

Harmonie.....$39.00
-IIGS PRINTER DRIVERS FOR HP PRINTERS

InTrec

ProTerm 3.1 NEW.....$78.00
-HIGHLY RATED APPLE II COMMUNICATIONS PROGRAM

TimeWorks

Publish It! v4.0.....$48.00
-APPLE II PAGE LAYOUT UTILITY

Seven Hills Software

(ALL COMPATIBLE WITH THE MANAGER)
Shoebox.....$34.00
-HOUSEHOLD RECORD KEEPING AND MESSAGING
Express.....$24.00
-IIGS PRINT SPOOLER
Kangaroo.....$28.00
-TIMESAVING FOLDER UTILITIES FOR IIGS
Manager.....$48.00
-MULTITASKING ON THE IIGS
SPECTRUM (NEW).....$CALL
-SYSTEM 6.0 BASED COMMUNICATIONS PROGRAM, SUPPORTS ZMODEM AND COMPUSERVE B+ PROTOCALS!

Apple Computer, Inc.

GS/OS System 6.0.....$39.00
HyperCard GS.....$69.00

// Productive

BullsEye TrueType Font Collection for the Apple IIgs. Includes over 300 TrueType Fonts, Font Viewing Utility, America Online Software Kit and MUCH MORE for only $45.99

// Productive BullsEye

and

WestCode Pointless $88.00

30 DAY MONEY-BACK GUARANTEE

Orders over $300 automatically upgraded to Airborne Express*

Æ PC-Transporter

Run IBM software on your Apple II
PC-T w/640k $229
GS or IIe Installation Kit $31
TransDrive 3.5" add-on $89
PC-T 101 key IBM style keyboard.....$79

MODEMS

SUPRA v.32bis, 14.4bps Send / Receive Data/Fax Modem (Universal).....$279
Zoom 2400 with Cable for IIgs.....$79

Check out Seven Hills Hot NEW Spectrum IIgs Communications Package!

(800) ASK-4IRO

(800) 275-4576

FAX ORDERS: (815)338-4332
TECH SUPPORT: (815)338-8746
INTERNATIONAL: (815)338-8658
ILLINOIS RESIDENTS: (815)338-8685
665 W. JACKSON ST.
WOODSTOCK, IL 60098

KaBlooie!

By Curtis C. Clifton

A computer game can be judged by how addictive it is. KaBlooie! succeeds to the point that it has an addiction warning built in. The object of the game seems simple enough—uncover a rectangular mine field without detonating a mine. The faster you uncover the field the better your score. High scores are saved for three preset levels of difficulty. Another option lets you customize the complexity of the playing field.

Installing KaBlooie!

To play KaBlooie!, use the Installer on your *GS+* Disk to install it on one of your own disks. If you need more help, refer to "How to Use Your *GS+* Disk" elsewhere in this issue. (You can also run KaBlooie! directly from your backup *GS+* Disk if you want.) After you have KaBlooie! installed, simply double-click on its icon to launch it. KaBlooie! requires System 6 or later.

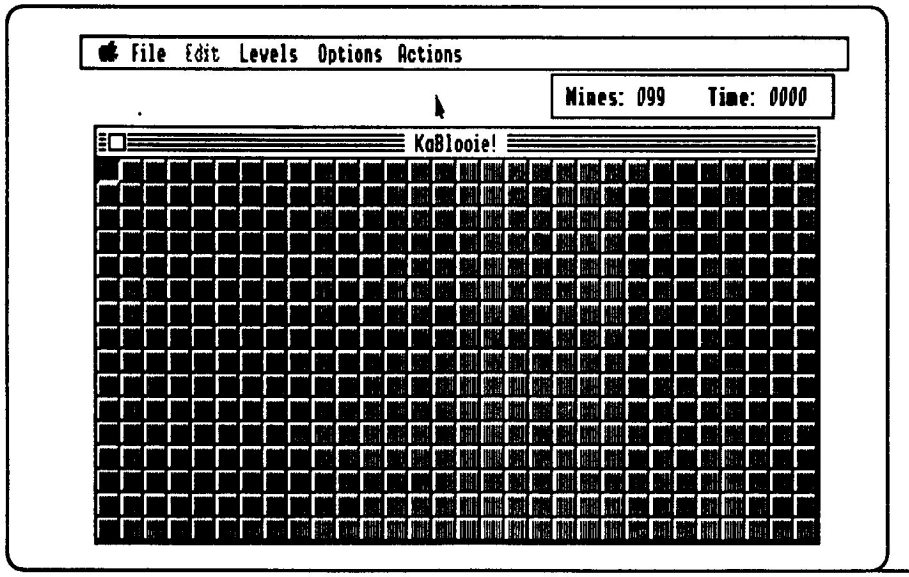
Using KaBlooie!

Once the game has loaded, the familiar menu bar will appear. A score window sits on the upper right corner of the desktop. This window will keep track of elapsed time and the number of mines you have left to uncover. Let's play a game to see how it goes.

Select the New Game menu item from the File menu to start a new game. A box with a thermometer will appear while KaBlooie! plants the mines. Next a window will appear with a field of gray rectangles. The first screen shot shows the unscathed mine field. The score window now shows the number of mines remaining hidden. The timer will not start until you uncover the first grid. Using your best psychic powers select a square that doesn't contain a mine. Double-click on this square to uncover it. At this point, one of three things will happen depending on your prognosticating prowess (or "luck" for the less alliterative). If the square you selected contained a mine, you will be greeted by an explosion and all the mines on the field will be uncovered. The fatal mine will appear exploded. If you were talented enough to find a mine on your first try, select New Game from the File menu and try again. However, if you were more fortunate, the blank square will be replaced with a number. This number indicates the number of mines in the surrounding eight squares. The third possible outcome of clicking on your first square is that you happen on a grid with *no* mines around it. In this case all eight surrounding squares will be automatically uncovered to show the mines surrounding them.

The number on an uncovered square tells you how many mines surround that square. By comparing the numbers on neighboring squares you can figure out where the mines must be. The second screen shot shows a typical game in progress.

Once you know where a mine is, you need to mark it. You can mark a mine with a red flag. "But how do I place the flag?" you ask. Clicking once on a covered square will plant a red flag. Clicking again on the marked square will remove the flag. If you add a flag and then want to remove it immediately, be careful not to click too quickly. Your two single clicks could be interpreted as a double-click, and you will end up uncovering the square.



By making educated guesses you can flag every mine on the field. When the mine count in the score window reaches zero and you have uncovered every square on the board, the game is complete. A victory sound signals your triumph. If you have achieved a new best time you will be prompted to enter your name.

Strategy

The key to a successful game is to work quickly but not guess unless you have no other choice. Obviously you will have to guess at the beginning of the game. But usually you will either quickly uncover several squares or die trying. Once several squares are uncovered you have a choice on what areas to focus on. When you reach a dead end in one area of the grid, ignore that area. By focusing on other areas you can often approach the dead end from a different direction and successfully find the mines. Utilizing the Check Around special feature is another key to faster times. This feature is activated by pressing and holding the mouse button while the pointer is on an uncovered square. If you have marked the correct *number* of surrounding mines (even if you marked the wrong locations), KaBlooie! will uncover the neighboring unmarked squares. If you correctly guessed the locations, Check Around will speed up the game by uncovering several squares at once. However, if you guessed the mine locations incorrectly, Check Around will expose the unmarked mines and you'll lose the game.

Keyboard Navigation

In addition to mouse control, KaBlooie! allows you to use the keyboard to play. You will notice that one of the squares on the mine field always appears shadowed or depressed. For lack of a better name, let's call this the "active grid." You can select a different active grid by using the arrow keys. Try moving the square around. To perform an action on the active grid, simply select an item from the Action menu or press its key equivalent. You can uncover a square by selecting the Uncover item or pressing Command-U. By selecting the Mark item (Command-M) you can set or remove a flag marker. You activate the Check Around action by choosing the Check Around item or pressing Command-A.

Special Features

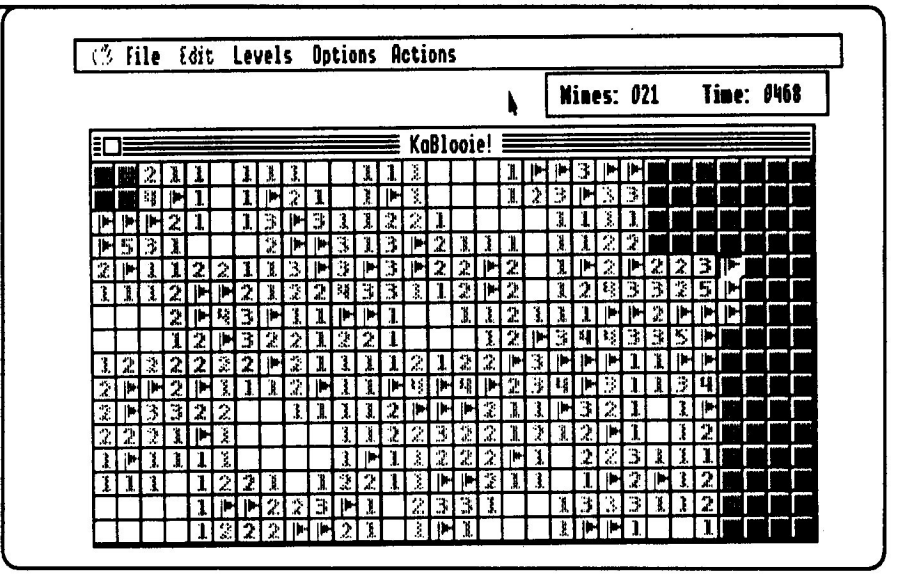
There are three built-in levels of

KaBlooie! Beginners can play on an 8 by 8 grid that contains only 10 mines. Intermediate players can move up to a 16 by 16 grid with 40 mines. Experts or people with a lot of time on their hands can tackle a 30 by 16 grid with a whopping 99 mines. Amazingly enough, you choose the level of difficulty by using the Levels menu. Selecting a level of difficulty does not effect the game currently in progress. The next new game you start will respect the current level setting. If the three standard levels don't offer enough variety, you can use the Custom Field item to create your own levels. Selecting Custom Field from the Levels menu brings up a dialog window. You can choose any height between 8 and 16. Widths between 8 and 30 are available. Finally a line edit box lets you enter the number of mines in the field. KaBlooie! is smart enough to not let you put 101 mines in a 10 by 10 field. Click on the OK button to change the level or the Cancel button to leave the level as is.

KaBlooie! has built–in help. Selecting the Help item from the Apple menu brings up a dialog box. At the top left of the window is a pop-up menu. Use this menu to select different help topics. You can use the scroll bar on the right side of the window to move through the text. When you are finished using the help window click on the Done button.

A pause feature lets you stop the clock when you have to leave in the middle of a hot game. Select Pause from the Options menu to freeze the game. Don't think about cheating though—the playing field is blanked while the game is paused.

The sounds used by KaBlooie! are included in the program's resource fork.



While this isn't important to be able to play the game, it is important if you don't have the Sound control panel installed. Although the sounds are included with the game, KaBlooie! needs the Sound control panel to play them. If the Sound control panel isn't installed, the game will just use the boring system beep for both the death and victory sounds.

While writing KaBlooie!, I often found myself spending too much time "testing the program" and not enough time finishing it. This dilemma inspired the addiction warning option. You activate this alarm by selecting the Addiction Warning item from the Options menu. A dialog prompts you to enter the number of games to play before the warning message begins appearing. Enter any number and click OK to activate the addiction warning. After you have played the specified number of games a warning will appear before each game giving you a friendly reminder of the number of games you have played. This reminder will continue until you leave the program.

KaBlooie! stores the record times for the three default levels of play. You can view the best times by selecting, you guessed it, Best Times from the Options menu. The best times are stored in a file called **KaBlooie.pref.** KaBlooie! is designed to work over a network. The best times file will be stored on the individual user's disk. If you want to erase the best times, select the Reset Best Times menu item.

Hope You Like It!

KaBlooie! was my first attempt at a full-blown desktop application. I tried to add as much professional polish as possible. If you have any problems with KaBlooie, please be sure to fill out and send in a Problem Form so they can be fixed. *GS+*

Don't Get Addicted!

By Josef W. Wankerl

Warning: This game is *very* addictive. I spent many long hours beta testing this program to make sure that you, the reader, get the most out of your *GS+* Disk. In fact, I have some high scores that I challenge you to beat! I managed to get an impressive beginner score of 22 seconds. On a good game I usually get about 24 seconds, but one day I was faster on the mouse button than ever before. With this game, it really helps to use the mouse instead of the keyboard simply because you can navigate the playing field faster. My best intermediate game was completed in 140 seconds. I'm sure that if I tried harder I could get a better score on this one, but I spent most of my time playing . . . the *expert* level! I must confess, the expert level is almost *impossible* to win.

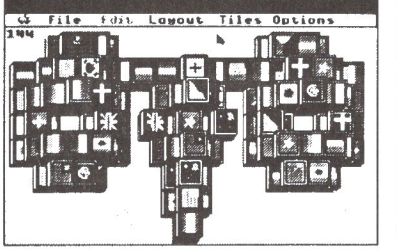
However, in the very last days of testing, I finally won! You have to be very lucky because you end up guessing an awful lot toward the end of the game. My best time was 803 seconds, and it could have been better if I hadn't spent time banging my head on the wall trying to guess which square to uncover. Can anyone else beat me? If so, write in and let me know your best scores! *GS+*

Exclusive Source for the Best IIGS Programs

The Lost Treasures

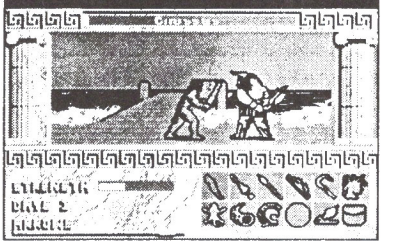
Lost Treasures of Infocom™: A compilation of 20 captivating games in one package including Zork, Planetfall, Deadline, Sorcerer, Spellbreaker, Infidel, Ballyhoo, Suspect, Witness and other classics. A fortune in Interactive Mystery, Fantasy and Science Fiction Adventures. Now available in GS specific format with menus and GS/OS compatibility! **Order product number BR93 for $59.95.**

Shanghai II



Shanghai II: Dragon's Eye™: Shanghai II gives you 8 beautifully detailed tile sets, over a dozen different layouts, animated tilesets and over 100 sound effects. Several ways to play - Solitaire, Challenge & Tournament. Beyond all this there is the interactive version of the Dragon's Eye, a special challenge for superior Shanghai players. **Order product number BR92 for $49.95.**

Ancient Glory

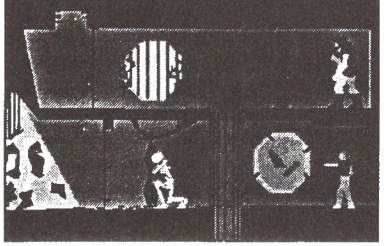


Ancient Glory™ from Big Red Computers. Brand new for the IIGS, this is an arcade action game based on the mythology of Hercules. Use a joystick to guide Hercules past raging bulls, centaurs, the Hydra, and the Minotaur. Your goal is to defeat Medusa and carry her head to Athena. The gods are watching and they will both aid and hinder your journey. **Order product number AG50 for only $20.**

Hover Blade

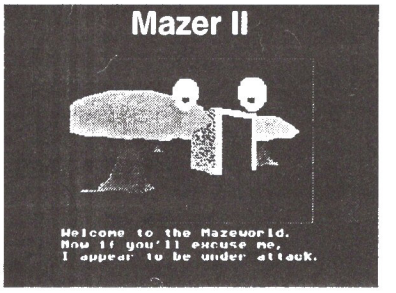
Hover Blade™ from MCX. GS+ Magazine rated Hover Blade in the top five IIGS games because of its astounding graphics and sound. You must test fly a new fighter hovercraft through treacherous terrain in order to prove its worthiness. Zip left, right, up and down to avoid collisions with 3-D objects that scream by at an alarming speed. You'll need to gather fuel and shield power. **Order product number MX50 for only $15.**

Out of This World



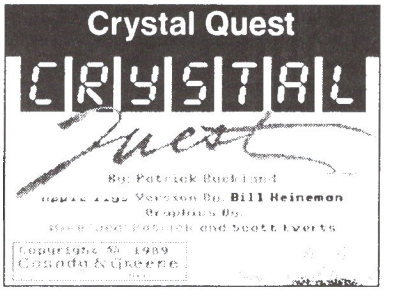
Out of this World™: HIGHEST RATED GAME EVER by Computer Game Review! Using the new technology of polygonal graphics, *Out of this World* is a masterpiece in action/adventure games. Hurtled through space and time by a nuclear experiment gone wrong you must blend logic and skill to survive the alien land. **Order product number IP60 for $49.95.**

Mazer II



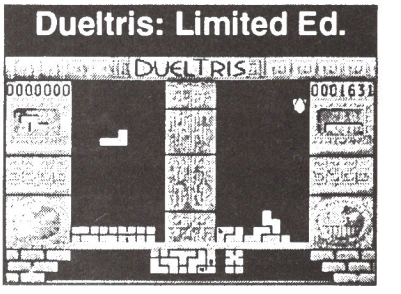
Mazer II™: Virtual reality on your IIGS. Cross a fantasy adventure with a flight simulator, then add a great deal more of something unexpected, and you have Mazer II. Enter a world of continuous movement with real-time point-of-view graphics for arcade action plus adventure. Be prepared to meet snails, seahorses, evil rats and The Oracle. Requires 1.25 Megs and System 5.0 or higher. **Order FF50 for $20.**

Crystal Quest



Crystal Quest™: Your job is to collect all the crystals while avoiding mines, bullets, and 12 different kinds of nasties which chase you through more than 40 different waves! There are nasties that hide in corners and gush bullets like a hail storm. There are nasties that come at you like a cruise missile. Warning : this is a *very* addicting game. **Product number CG50 is only $20.**

Dueltris: Limited Ed.

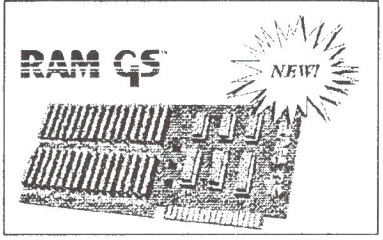


DuelTris™: Just when you thought you'd seen every variation on Tetris™, DreamWorld releases DuelTris. It's similar to Tetris, but you can play against another human or against the computer. When one player fills out a row, it's moved to the other player's field making it more difficult. Plus there are special pieces like a gun, a bomb and an anvil to liven things up. **Order DG55 for $25.**

Big Red COMPUTER CLUB
423 Norfolk Avenue, Norfolk, NE 68701

Fast Service
Order by Fax (402) 379-3361
Order by phone (402) 379-4680
MasterCard or Visa Accepted
School purchase orders accepted
No Credit Card Surcharge. Add $3 per order for shipping and handling fee for UPS Ground/Priority Mail. Add $7 per order for UPS Blue Label (2 day) delivery. Call for Overnight & International Shipping Charges.

RAM GS



Sequential Systems RAM-GS™: With memory expansion this cheap, there's no excuse for "Out of Memory" errors. RAM-GS is a low-cost, 4 Megabyte memory expansion for the IIGS. Easily installed, it is fully compatible with GS/OS, DMA and all software. Its multi-layer circuit design makes it run cool and draw less power. **Order product number SQ50 for only $129.**

For Free Catalog and To Order - Call Now! - (402) 379-4680

What's New

Compiled by Steven W. Disbrow

Updates From WestCode

WestCode has announced updates to two of its most popular programs: Pointless and HardPressed. (If you are a registered owner of either of these products, you should have already received an update notice in the mail.)

Pointless v2.0.3 comes hot on the heels of version 2.0.2, and incorporates the following changes:

- Fixes a bug related to TrueType fonts in the Choose Font dialog under System Software v6.0.1.
- Improves rendering of TrueType fonts to provide more compatibility with a wider range of fonts.
- Improves the rendering of certain accented characters (like é for example).
- Fixes some memory management problems that can cause some odd behavior in the reports generated by TypeSet.

HardPressed v1.0.1 contains the following new and improved features:

- Fixes a bug that caused some HyperCard IIGS stacks to become corrupted.
- Fixes a bug that caused some GraphicWriter III v1.1 files to become corrupted.
- Files of type TXT are now actually compressed by the Standard, Faster, and Smaller compression profiles.
- Various performance improvements, including an LZSS module that compresses 5% to 20% faster than before!

Each update is only $5 when ordered directly from WestCode. However, if you are a member of either America Online or GEnie, you can get one or both of these updates online for the cost of the download! An update utility for Pointless is available on both America Online (in the WestCode customer support area) and GEnie (it's file #21421). And, an update utility for HardPressed is available on GEnie (it's file #21549). Apparently, the HardPressed update is not available on America Online.

For more information on either of these updates, contact:
WestCode Software, Inc.
15050 Avenue of Science, Suite 112
San Diego, CA 92128
Orders: (800) 448-4250

DiscQUEST

Sequential Systems has just announced the upcoming release of a new CD-ROM utility for the IIGS: DiscQUEST. The press release we received was a little on the vague side, but, from what I can gather, DiskQUEST will allow you to view, print and export text and graphics files on CD-ROMS. And, DiscQUEST also promises support for audio CD's!

Apparently, the DiscQUEST software contains built-in support for various CD-ROM titles that are currently available only for other computer platforms. This will allow IIGS owners to use titles that they simply were not able to use before!

Initially, DiscQUEST will be available in two different forms:

- The DiscQUEST Software package will a copy of the DiscQUEST software along with a copy of the CD-ROM title, "The Family Doctor," from Creative Multi-Media. The suggested retail price for this package will be about $99.
- The DiscQUEST System will be a software and hardware bundle that includes the DiscQUEST software, along with a CD-ROM drive (including a cable and a disc caddy), a RamFAST/SCSI interface card and four different CD-ROM titles for use with the DiscQUEST software. The suggested retail price for this package will be around $600.

For more information, contact:
Sequential Systems
1200 Diamond Circle
Lafayette, CO 80026
(303) 666-4549

ICON Handle It

Undaunted by the untimely demise of their last publication, *Fishhead's Children*, Resource Central has launched a new venture: an international user's group that goes by the name of ICON. "ICON" stands for "International Computer Owner's Network," and it's a group that will welcome *all* computer owners from all over the planet.

Membership in ICON costs only $8 per year, but if you are already a subscriber to one of Resource Centrals numerous publication, you are automatically a member! As a member of ICON, you get a subscription to *Ahs*, a quarterly newsletter, , access to system software and other goodies published by Apple Computer Inc. (for just $3 a disk!) and the ability to buy back issues of other Resource Central disk publications for only $3 an issue. In addition, ICON members get discounts on Resource Central publications, and special deals on access to the GEnie online service.

For more information send e-mail to "ICON@genie.geis.com", or write to:
ICON
P. O. Box 11250-I
Overland Park, KS 66207

Super Menu Pack

Seven Hills Software has just released Super Menu Pack for the IIGS. This is a collection of three utilities: a WYSIWYG font menu, a hierarchical Control Panel menu and a pop-up "pick and choose" display of all the characters in a font.

The WYSIWYG font menu is very similar to the one in TypeSet (see review in the last issue of *GS+* Magazine)—it changes your Font menu so that each of your fonts is displayed in its own typeface. (However, if you already have TypeSet, Super Menu Pack will deactivate its own WYSIWYG display so as not to interfere with all the neat things TypeSet does. Better still, if you own TypeSet, you can get Super Menu Pack at a special price.)

The hierarchical Control Panels menu is extremely cool. With Super Menu Pack installed, the Control Panels item in your Apple menu becomes a menu all its own! Listed in this menu will be all of the control panels that are currently installed and active. To select one, you just select it from the sub-menu and it opens automatically!

The "pick and choose" character display is also extremely cool and useful. Just hold the mouse button down in a special area of the screen and a window appears displaying all of the characters available in the currently selected font! To pick one, just select it with the mouse and let go of the mouse button. The character is then typed into your current document just as if you had typed it from the keyboard! This pop-up chart will also tell you how to type each special character yourself—just hold the mouse over the character and the keystrokes needed to type the character are displayed. Finally, if you need more than one special character, just select the "More..." option and the window will remain open so that you can select multiple characters to type into your document!

The bottom line is that Super Menu Pack is cool. It only costs $30, so you should probably get it. Contact:
Seven Hills Software
2130 Oxford Road
Tallahassee, FL 32304-3930
(904) 575-0566 *GS+*

GS+ Back Issue Half Price Sale!

Back Issue Magazine only $2.25 Back Issue Disks only $3.25!
Back Issue Magazine + Disk Sets only $4.75! *Hurry! Special Pricing Ends February 28th 1994!*

Sep-Oct 1989 (V1.N1)
- System Software 5.0 Compatibility Chart
- NoDOS - A file utility New Desk Accessory
- Graphics Galore - Drawing "how-to" with pictures on disk
- Reviews: Arkanoid II (new custom levels on disk), Crystal Quest, ORCA/C, Rocket Ranger, Silpheed, Test Drive II, TransWarp GS, Turbo Mouse ADB

May-Jun 1990 (V1.N5)
- AppleFest Report
- Beginner's Guide to System Disks - Part 1
- GS/OS prefixes - PreFixer CDev
- Brush with Greatness - How your IIGS makes colors
- Reviews: CMS 45MB Removable Hard Drive, S&S-RAMCard, DataLink Express modem, Visionary GS digitizer, GraphicWriter III, ZapLink, McGee, Math Blaster Plus IIGS, The New Talking Stickybear Alphabet, ZipGS

Sep-Oct 1990 (V2.N1)
- Brush With Greatness - Making the most of your digitizer
- Interview with Brian Greenstone (programmer of Xenocide)
- PING - Video table tennis program
- Shuffle - An INIT that shuffles desktop windows
- Battery Brain - A CDev that saves BRAM parms
- Reviews: GS Sauce memory card, Salvation—Wings, World GeoGraph, Orange Cherry Talking Schoolhouse series, QIX, Solitaire Royale, InnerExpress

Jan-Feb1991 (V2.N3)
- AppleFest/Long Beach '90 & Apple II Achievement Awards
- Interview with Jim Carson of Vitesse, Inc.
- Introduction to System Software v5.0.4
- RAM Namer - A CDev that allows you to rename RAM disks
- *GS+* program updates: Battery Brain v1.1, EGOed v1.32c, Teach Translator for GraphicWriter III v1.1
- Reviews: ZipGSX, LightningScan, Design Your Own Home, Print Shop Companion IIGS, Your IIGS Guide, Dragon Wars, 2088: The Cryllan Mission - Second Scenario, Space Ace, Sinbad & the Throne of the Falcon

Sep-Oct 1991 (V3.N1)
- Protecting Your Investment - A Guide to Surge Protection
- A Conversation with Roger Wagner - Part 2
- Working with the Toolbox - Part 4: QuickDraw II
- FGS - A desktop program that generates Fractals
- *GS+* program updates: EGOed v1.36, Autopilot v1.1, NoDOS v1.6
- Reviews: two 100MB hard drives, Nite Owl Slide-On Battery, ORCA/Integer BASIC, ORCA Talking Tools, Storybook Weaver: World of Adventure HyperBole, HoverBlade, Shareware: DeskTop Painter, SoundSmith, IIGS Classic: Bard's Tale IIGS

Jan-Feb 1992 (V3.N3)
- How Printing Works - An article by Matt Deatherage
- Working with the Toolbox - Part 6: The Resource Manager
- Buying & Using Mac Hard Disks
- Cool Cursor - A Control Panel that replaces the old watch cursor with an animation
- Replicator - A desktop-based disk duplication program that works with any GS/OS device and file system
- *GS+* program update: EGOed v1.4
- Reviews: MacLand 105MB Hard Drive, Tulin 120MD Hard Drive, SuperConvert, Signature GS, Learn to Program in C, 4 shareware reviews

Jul-Aug 1992 (V3.N6)
- KansasFest 1992
- Introduction to 3-D Graphics - Part 3: Speeding Things Up
- Working with the Toolbox - Part 8: The Control Manager
- Understanding FSTs
- Using rBundles in Your Programs
- Quick Folder - A Finder Extension that allows you to open folders from the Finder's Extras menu. **Requires System 6.**
- Extra Bits - A Control Panel that lets you change the new Battery RAM parameters that System 6 didn't provide a Control Panel for. **Requires System 6.**
- *GS+* program updates: EGOed v1.7 **(requires System 6)**, Quick DA v2.0 **(requires System 6)**, Replicator v1.3
- Reviews: ZipGS (10MHz CPU/64K Cache), Gate, Space Fox, Utility Launch & Utility Works

Sep-Oct 1992 (V4.N1)
- Apple EXPO East
- Open From Desktop - A Finder Extension that allows you to open any item on your desktop from the Finder's Extras menu. **Requires System 6.**
- II Notes - A 20-page NDA notepad. **Requires System 6.**
- Miscellaneous Library - A collection of useful routines to use from any programming language that supports linking to standard libraries
- *GS+* program updates **(require System 6)**: Autopilot v2.0, Quick DA v2.1, EGOed v1.7.1
- Reviews: ContactsGS, GSymbolix, Kangaroo, ORCA/Debugger, UltraCat, Storybook Weaver: World of Make-Believe

Nov-Dec 1992 (V4.N2)
- Understanding Accelerators
- The Basic IIGS
- Working with the Toolbox - Part 9: The Menu Manager
- Font Reporter - A program that lets you display and print out any font in your system. **Requires System 6.**
- Miscellaneous Library (updated)
- *GS+* program updates: EGOed v1.8 **(requires System 6)**, Replicator v1.3.1
- Reviews: AutoArk, 1990 GEM Apple II CD-ROM, IIGS System Transport Case, Out of This World, TrueType Font Collection, Universe Master
- Review updates: Desktop Enhancer v2.0, Pointless v2.0

(All programs after this issue require System 6, unless otherwise noted)

Any issues that are not listed are sold out.

Jan-Feb 1993 (V4.N3)
- The World at Your Fingertips
- Understanding the Desktop
- Batt Reporter - A program that generates plain English reports from battery RAM configuration files
- Rainbow - A Finder extension that lets you change the colors of your device icons
- Miscellaneous Library (updated)
- *GS+* program updates: Battery Brain v2.0, Open From Desktop v1.0.1, Rebuild Desktop v1.1, EGOed v1.9
- Reviews: CV-Ram Memory Card, StyleWriter printer, ProSel-16, TransProg III v1.1, Ant Wars, FloorTiles, Quest for the Hoard

Mar-Apr 1993 (V4.N4)
- Beginner's Guide to Finder v6.0
- Working with the Toolbox - Part 10: LineEdit
- LASERbeam - A program that lets you download PostScript files to a PostScript printer
- Font Memories - A control panel that lets you keep your bit-mapped fonts on a disk other than your startup disk
- EGOed lite - a smaller, faster version of the EGOed New Desk Accessory
- Miscellaneous Library (updated)
- *GS+* program updates Rainbow v1.0.1, NoDOS v1.8
- Reviews: Salvation—Deliverance, DreamGraphix, The Manager, The Passport House Letter, The Lost Tribe, DuelTris

May-Jun 1993 (V4.N5)
- The Scavenger - Using your IIGS with CD-ROMs from other computers
- Apple EXPO West Report
- Anna Matrix - a Cool Cursor Editor
- *GS+* program update: Cool Cursor v2.0, Miscellaneous Library
- Reviews: Apple Desktop Bus Mouse II, Baccarat, Key Fonts Pro CD-ROM, MAZER II: The Ghost of Mordaine, Pick 'n' Pile, Shanghai II: Dragon's Eye, Solarian GS, Twilight II, TypeWest Volume 1

Jul-Aug 1993 (V4.N6)
- System 6.0.1—For Users
- KansasFest 1993
- Catch the .WAV: A Guide to Scavenging Sound Files
- Secrets of Writing Twilight II Screen Blankers
- Finder Binder: Avoid the annoying "An application can't be found for this document" dialog by connecting documents to an application
- *GS+* program updates: AutoSave v2.0, EGOed lite v1.0.1, Extra Bits v1.0.1
- Reviews: Castle Metacus, HardPressed, The Lost Treasures of Infocom, Treasures From Heaven: Quest for the Hoard 2, Your Money Matters, Zip Drive

Sep-Oct 1993 (V5.N1)
- So You Bought a Hard Disk . . . Now What?
- Apple (Jive) Talkin'
- An Introduction to Object Oriented Programming
- File Dump: A complete Object Oriented Programming example written in ORCA/Pascal v2.0.1.
- *GS+* program updates: Anna Matrix v1.0.1, Cool Cursor v2.0.1
- Reviews: Applied Engineering's High Density Disk Drive, Apple II SuperDrive Controller Card, MODZap, soniqTracker, ORCA/Pascal v2.0.1, SoundMeister, TypeSet

All prices *include* postage and handling (orders will be sent First-Class to the U.S., Air Mail to Canada and Mexico, and surface mail to all other countries. For Air Mail to all other countries, add an additional $3.50 per issue). *Tennessee residents must add 7.75% sales tax.* Mail back issue requests to: *GS+* Back Issues, c/o EGO Systems, PO Box 15366, Chattanooga, TN, 37415-0366; or call 1-800-662-3634, Monday through Friday, 9 a.m. to 6 p.m. Eastern Standard Time, to order or verify availability. Please include your phone number on all orders placed by mail(in case we are sold out of an issue)! For MasterCard or VISA orders placed by mail, also include your card number, expiration date, and signature.

Rumors, Wishes & Blatant Lies

By Prof. G.S. Gumby

Wither . . . Net?

Remember the EtherNet card for the Apple II that Apple spent a couple of years developing? You know, the one that they supposedly completed and then canned at the last minute. Yeah, that one.

Well, rumor has it that a certain manufacturer of Apple II peripherals is trying to purchase the rights to the EtherNet card so that they can sell it themselves. Unfortunately, the rumors don't make any mention of whether or not they are actually getting anywhere in the negotiations with Apple.

Point and Plugs Aplenty

Do you love System 6.0.1? You don't? Well, it's probably because of all those annoying *little* bugs isn't it? Yeah, I know, but, these things happen.

Still, we may not have to suffer with them for too much longer. Rumor has it (and this is *only* a rumor, OK? So, don't call us or Apple to ask about it!) that some of the former members of the Apple II Continuation Engineering Group are, putting together a System 6.0.1 "tune up" in their spare time. If this comes to pass, you'll be able to run this tune up disk and it will fix some of the problems with System 6.0.1. Again, it's only a rumor, but keep your fingers crossed!

What's Going On Here?

Jeepers, I'm running out of rumors! This "handing articles in on time" business is a real pain for those of us that have our creative juices flowing on a particular schedule.

Then again, you'd be amazed at how creative you can become when your production manager constantly brings in newspaper clippings about a certain "Mr. Bobbit" and leaves them on your desk with the note, "John Bobbit had trouble getting things in too . . . ."

AFL Bye Bye

There's a nasty rumor flying around America Online that the management bigwigs at America Online, Inc. have decided to drastically cut back on the support they give to Apple II users. Watch for an announcement sometime around the first of the year.

Half-Breed

At the recent Comdex trade show in Las Vegas Nevada, Apple Computer Inc. announced that it was developing (and would soon be shipping) a new Macintosh that could also run IBM PC compatible software! This new machine should come as welcome news to companies that have both Macs and PCs on their desktops. Best of all is the rumored price, under $2,000.

The AppleWorks GS Update

Quality Computers has announced that they've acquired the rights to this product, and they are taking suggestions from users for new features, but there is no word yet as to when an update is forthcoming. (After waiting this long though, I personally hope they take their time and do it right the *first* time!)

Sorry

Having noted the success of "Out Of This World" (see review in *GS+* V4.N2), by InterPlay, several of our astute readers have called or written to ask if there would be a sequel. Well, Delphine Systems, the folks that originally designed Out Of This World, *have* done another game (called "Flashback") which uses the same polygon-based graphics. Unfortunately, this game isn't really a sequel—it's just a similar game designed by the same people. Even more unfortunately, there probably won't ever be a IIGS version. The reason is that InterPlay (the people that did the IIGS version of Out Of This World) doesn't have the license to Flashback, so they can't do a conversion for *any* computer.

Hissssssss

Hear that? It's the sound of vaporware escaping from the press releases of IIGS developers all over the world. So, I thought I'd try to get the latest word on some of the hottest vapor. I contacted Seven Hills Software and ECON Technologies for the latest scoop, and here's what I found out:

Spectrum
According to Earl at Seven Hills Software, Spectrum is actually (finally!) *in production*! That means that they are actually printing manuals and duplicating disks even as I sit here writing this (in the middle of November). Hopefully, Spectrum will be shipping by the time you read this! If it is, watch for a full review in the next issue or two of *GS+* Magazine!

Update To The Manager
The latest word on the next version of The Manager is that Seven Hills *hopes* to have it out very soon. However, no ship date was mentioned.

The GraphicWriter III Update
Seven Hills *hopes* to have this out by the spring of 1994. However, the person I spoke with at Seven Hills made it clear that this is just a tentative guess. At this point, the new version of GraphicWriter III is not even in beta testing!

Addressed For Success
The lovely Karen Proni at ECON Technologies tells me that this started shipping in early November! So, look for a review in an upcoming issue of *GS+* Magazine.

Digital Session v1.0
D. Proni of ECON Technologies (not quite as lovely as Karen, but hey, he's a guy) tells me that Digital Session is almost done. All it needs are a few more filters, a couple of new effects, and just a few bugs squashed, and it will go out the door. Hopefully, by the end of the year.

UniverseMaster Update
D. also told me the he is getting very close to finishing the next UniverseMaster update, but that there is still one bug left to be squashed in the file optimizer. This bug is also the only thing holding up the release of the next version of AutoArk. (Because these two products work so closely together, ECON wants to release these new versions of them at the same time.)

SoundMeister Pro
By now, everyone should know that ECON has cancelled production of the SoundMeister Pro sound card. What you may *not* know is that, due to this cancellation, ECON has decided to extend the price discount on the original SoundMeister board (with this discount it costs a mere $59). So, if you didn't buy a SoundMeister because you were waiting to go Pro, you should give the original board another look.

Ho! Ho! Hold It!

Got a hot IIGS rumor? Got something that you wish would come to pass for the IIGS? Got a blatant lie that you want to circulate about someone in your user group? Well, heck, Christmas is that time for wishes! And tax time, the season of blatant lies, is just around the corner! So, send your rumors, wishes and blatant lies to:

GS+ Rumors
P. O. Box 15366
Chattanooga, TN 37415-0366 *GS+*

How to Use Your GS+ Disk

The first thing you need to do is **make a backup copy of your *GS+* Disk with the Finder!!!** Do *not* make your backup on your hard disk! Instead, copy the *GS+* Disk to another 3.5-inch disk (this is *very* important). Next, put the original in a safe place. If you are having a problem making a backup copy, give us a call at (615) 843-3988. If your disk is damaged, let us know, and we'll get a new one to you as soon as possible.

Installing The Software

To install the software on this issue's *GS+* Disk, start up your computer using System Software v6.0 or later. (Note that all of the programs on this issue's disk *require* System 6!) Next, place your *backup* copy of the *GS+* Disk in a drive. (You *did* make a backup didn't you?) Now run the Installer program that is on your backup *GS+* Disk. (From the Finder, just double-click on the Installer icon.) *It is* extremely *important that you use the Installer that is on your backup* GS+ *Disk! Do* not *use any other copy of the Installer!*

When the Installer window appears, select the item you want to install from the list on the left-hand side of the window, and the disk you want to install it on from the list on the right-hand side of the window. Then click on the Install button. For more information on using the Installer, refer to your IIGS owner's manual.

Before you attempt to use your backup *GS+* Disk, please take a few minutes to read the **a.Read.Me** file for any last minute corrections or information. If you do not already have our EGOed (or EGOed lite) text editor installed in your system, you can use the Teach application supplied with System Software v6.0 to read this file.

Installing EGOed lite

The following is a detailed example of how to install EGOed lite. The other programs are installed in a similar manner.

- Start up your IIGS with System Software v6.0 or later—the version of EGOed lite that is on this *GS+* Disk *requires* System 6! (Your *GS+* Disk is *not* a startup disk, so don't try starting your computer with it.)

- Insert your backup copy of the *GS+* Disk into a drive and run the Installer program that is on your backup *GS+* Disk. It is *very, very* important that you run the Installer that is on your backup *GS+* Disk and *not* some other copy of the Installer.

- When the Installer finishes loading, click on the Disk button on the right-hand side of the Installer window until your startup disk appears. (If you only have one 3.5-inch disk drive, you will have to remove the backup *GS+* Disk from the drive and replace it with your startup disk. You should also refer to the "Making Room" section below for hints on how to free up room on your boot disk.)

Please Remember . . .

The contents of the GS+ Disk are not public domain or shareware! We depend on your honesty to stay in business. Please do not give away copies of the GS+ Disk or any of the programs on it. If you do, we will not be able to stay in business. It really is that simple!

- On the left-hand side of the Installer window, you will see a list of the items on the backup *GS+* Disk. One of the items in this list should be "EGOed lite." (If EGOed lite is *not* in this list, quit the Installer and begin again. Be sure that you are running the copy of the Installer that is on your backup *GS+* Disk!) Once you see the EGOed lite item, click the mouse on it so that it becomes highlighted.

- Click the mouse on the Install button in the middle of the Installer window. The Installer will then install EGOed lite on your startup disk. If you only have one 3.5-inch disk drive, you may have to switch disks several times. Just insert each disk as the Installer asks for it.

- When the Installer has finished, click on the Quit button in the middle of the Installer window. This should cause your IIGS to restart.

- When your IIGS finishes restarting, pull down the Apple menu and select EGOed lite (note that you have to be in a desktop program like the Finder to have access to the Apple menu).

- When it finishes loading, notice that EGOed lite has its own menu bar. Select Open from the *EGOed lite* File menu and then put your *GS+* Disk in a drive. You should see a list of the files and folders on the *GS+* Disk.

- Open the **Documentation** folder on your backup *GS+* Disk and then open the file **EGOed.lite.Docs**. This file contains complete documentation on how to use EGOed lite. *Please take a few minutes to read this documentation.*

Making Room

If you do not have a hard drive, you will probably have to remove some files from your startup disk to make room for the New Desk Accessories, control panels, and other system files on your *GS+* Disk.

Towards that end, we have prepared the following list of "expendable" files that you can "safely" remove from your System Software v6.0 startup disk to free up some space. (We've put quotes around "expendable" and "safely" because almost *all* of the files in the IIGS System Software have some sort of use! The files listed here are the ones that are the "least" useful for a specified hardware setup.)

Be sure that you *never* delete *any* files from your original System Software boot disk! Always work on a backup copy!

System Software v6.0

If you use the System 6 **:Install** disk to create a minimal, 800K, System 6 boot disk, that disk will have 26K of free space on it when the installation is finished.

It must be noted that *all* of the files on this disk are *very* important and the files that you can *safely* remove depend, for the most part, on your hardware setup. So, please read these instructions carefully before removing *any* files.

The first two files you can delete depend on what you will be doing with your IIGS. If you will not be running AppleSoft BASIC programs, you can remove the file **BASIC.System** (11K) from the root directory of the disk. If you will not be running ProDOS 8 software, you can remove ***:System:P8** (18K).

If you do not care what time it is, you can delete the following file:

***:System:CDevs:Time** (11K)

After that, the files that you can safely remove depend on your *hardware setup*.

If you have a ROM 01 IIGS, you may delete the file:
***:System:System.Setup:TS3** (41K)

If you have a ROM 03 IIGS, you may delete the following file:
***:System:System.Setup:TS2** (37K)

If you do *not* have a 5.25-inch drive, you may delete the following 8K file:
***:System:Drivers:AppleDisk5.25**

If you do *not* have a printer, you may delete the following file:
***:System:CDevs:Printer** (5K)

Finally, if you have deleted all control panels, and you won't be installing any control panels from the *GS+* Disk, you can also delete the 19K file:
***:System:Desk.Accs:ControlPanel**

Removing some or all of these files will give you ample room (up to 139K on a ROM 01 IIGS and up to 135K on a ROM 03 IIGS) on your startup disk to install EGOed lite or any of the other system utilities from your backup *GS+* Disk.

Having Problems?

*If you are having a problem with one of the programs on your **GS+** Disk, we want to help! But we can't help if we don't know about it!*

*If your **GS+** Disk is defective, let us know and we will send you a replacement. You can call us at (615) 843-3988 (Monday through Friday between 9 a.m. and 6 p.m. Eastern Time), to request a replacement disk.*

*If you are having a problem using one of our programs, please fill out the problem form that is on your **GS+** Disk and send it to "**GS+** Problems" at the address shown below.*

Note: You will *not* be able to print from EGOed lite or any other desktop program when using an 800K, System 6.0 boot disk. (There isn't enough room for all of the required drivers and control panels.)

If you want to save even *more* space, you might want to consider using Autopilot (from *GS+* V4.N1) as a replacement program launcher. With Autopilot installed on the minimal System 6 boot disk, initial free space goes up from 26K to 163K! You can then use Autopilot to autolaunch the Finder from a second 3.5-inch disk drive and still have plenty of room on your boot disk for lots of system extensions. For more information on Autopilot, refer to the "Autopilot v2.0" article in *GS+* V4.N1 or give us a call.

Self-Extracting Archive

We use GS-ShrinkIt v1.1 to compress the *source code* and related files on the *GS+* Disk into a *self-extracting archive*. To extract the files from the archive, simply double-click on the **GSP.V5.N2.SEA** program on your backup *GS+* Disk. ***You do not need to have a copy GS-ShrinkIt in order to use any of the programs or other materials on this GS+ Disk!*** However, you will gain better control over

did not receive the disk with this magazine and have decided you would like to have it, just send a check or money order for $6.50 to:

Or call us at 1-800-662-3634, Monday through Friday between a.m. and 6 p.m. Eastern Time, to bill it to your MasterCard or VISA.

Tennessee residents add 7.75% sales tax.
ncludes First-Class delivery to the U.S., air mail to Canada and Mexico, or e mail to all other countries. Add an extra $3.50 ($10 total) for air mail to all other foreign countries.

IMPORTANT:
Use scissors or a knife to open disk bag!
Do not attempt to pull bag away from magazine!

the files you wish to extract if you have GS-ShrinkIt v1.1. If you do not have GS-ShrinkIt v1.1 and you would like a copy, check with your local user group or give us a call here at *GS+* Magazine and we will try and help you locate a copy.

What's On The Disk

The programs on this disk *require* System Software v6.0 or later. There are seven items in the root directory of this disk:

a.Read.Me

A lot can happen from the time we send this magazine to the printer and the time we get ready to mail them out. If anything does happen, we will put everything we can find in this file. Please read this file before using the *GS+* Disk.

Documentation

This folder contains the EGOed lite documentation file. This is a Teach file which can be read using Teach, EGOed lite, or any other TextEdit editor.

GSP.V5.N2.SEA

This is a self-extracting archive (SEA) containing the source code and related files for all the programs contained on this *GS+* Disk. The archive also contains the Miscellaneous Library. Technical information, such as the Miscellaneous Library documentation and technical notes are supplied in the archive as well. To extract the files from the archive, simply double-click on this file from the Finder. Note that if you try to extract *all* of the files from this archive at one time, they will *not* fit on an 800K disk! So much material was on this disk that we had to shrink the **Talk.To.GSPlus** folder. This folder contains our feedback form, the complete *GS+* Glossary, a troubleshooting guide, a problem form, and our writer's guide.

The feedback form is a plain ASCII text file. Fill it out, and let us know what you thought of this issue.

The *GS+* Glossary file is a plain text file containing all of the terms defined in the past installments of the "*GS+* Glossary".

The troubleshooting guide contains tips on how to resolve some of the more common problems you may experience while trying to use the programs on your *GS+* Disk. If you are having a problem, *please* read this file before you go to all the trouble of filling out a problem form! But, if the troubleshooting tips don't help, *please* fill out the problem form and send it to us! This is a Teach file, you may use EGOed lite or the Teach application to view it.

The writer's guide is a Teach file that explains what you need to know to write. for *GS+* Magazine—you may use EGOed lite or the Teach application to view it.

Icons

This folder contains Finder icons used by the various programs on the *GS+* Disk.

Installer

This is the Apple IIGS Installer. The installer requires System Software v5.0.4 or later. Run it to install the other programs on this issue's disk. For more information on using the Installer, be sure to read the example on the previous pages, and refer to your IIGS owner's manual.

Programs

This folder contains Balloon, CD-ROaM, EGOed lite, KaBlooie!, and List.Volumes programs. Use the Installer provided on your backup *GS+* Disk to automate the installation of these files. CD-ROaM, EGOed lite, and KaBlooie! all require System 6 to operate. Balloon requires System 6.0.1 to operate. List Volumes is an AppleSoft BASIC program, so it should run under any version of the System Software. (Note that the List Volumes program does *not* have an Installer script. For more information on this program, see the review of the Tulin Floptical drive, elsewhere in this issue.)

Scripts

This folder contains all of the scripts that are used by the Installer to install the files from this *GS+* Disk. *GS+*

How to Get System 6.0.1

Everyone should have a copy of System 6.0.1. Fortunately, we have a license to distribute it to our magazine-and-disk subscribers as a part of their subscription. Unfortunately, we can't afford to mail all five of the disks that System 6.0.1 takes up to every magazine-and-disk subscriber. However, we still want to make it easy for you to get System 6.0.1. So, if you are a subscriber to *GS+* Magazine with the companion *GS+* Disk (sorry, but we can *not* distribute System 6.0.1 to our magazine-only subscribers), send us the following items and we will send you System 6.0.1:

1) Five (5) *blank* and *formatted*, 3.5-inch diskettes to our P. O. Box address (which is shown on the back of your magazine). We are asking for "blank and formatted" disks because formatting takes time that we don't have, and it's a great way to tell if a disk is good before you send it to us. *If you send us a bad disk, we aren't going to replace it.*

2) A *self-addressed* return disk mailer with enough postage on it to mail the five disks back to you. (Foreign subscribers without access to United States postage may include International Postal Coupons instead. See your local post office to obtain these.) *If you don't provide a postage-paid, self-addressed return mailer, your disks will be considered "gifts" and will be used for backups.*

3) That's all. Don't send any money. We don't want any money for this.

How Else Can You Get It?

If you are a magazine-only subscriber, here are some other ways to get System 6.0.1.

Your Apple dealer. Bug them until they get it in for you. The retail price is $39, but that includes manuals. The part number is #A0077LL/A. For the name of your local Apple dealer, call (800) 538-9696.

Your user group. Take your own disks and they should only charge you a small copying fee. Some user groups may have it already copied for you and available for a nominal charge. (Note that some user groups make these services available only to their members. Of course, you do plan on joining, don't you?) If you need to know where your local user group is, call the Apple User Group Connection at (800) 538-9696 extension 500.

Resource Central. You won't have to bug them, they have it in stock, and in no less than three different "flavors." For just the disks (item number DA-006), the price is $24. For the complete end-user package, including manuals, the price is $39 (item number DA-0013). Finally, if you want the *ultimate* System 6 bundle, you can get the official System 6 Golden Master CD-ROM for only $99 (item number DA-0029). Take your pick, and then give Resource Central a call at (913) 469-6502.

And, of course, if you have a modem, you can download it from your favorite online service. The total download time is about 5 hours. *GS+*

APPLE][PERIPHERALS • UPGRADES • SERVICE PARTS • HARD DISKS
SCHOOL & UNIVERSITY P.O.s ACCEPTED! • SCHOOL QTY. DISCOUNTS AVAILABLE*

RAM CHIPS

RAM Chips for your....
Expanding your... Apple IIgs Memory Card, Æ GS-RAM, Æ RAMWorks, Super Expander & Compatibles
768K Exp. Set (24 41256).....$24.00
41256.....$1.25
Expanding Your GS Juice+, S&S ÆGS RAM + / II , CV Tech or Chinook 4000
41024 (1 Meg) $3.00
Bank of 8 .....$24.00
Expanding Your Æ GS-RAM Ultra or RAMPak4 GS
44256 (256x4) $3.00
Bank of 8 .....$24.00
Expanding Your OctoRAM, GS Sauce, Q-RAM GS, Pacemark 4 Meg RAM Card
1 Meg SIMM $24.00
RAMFast / CV Tech RAM 1Meg Upgrade Set 2 441024-80.....$40.00

PC Transporter

101 Keyboard for PCT $29.00
PCT IBM Keyboard Cable.....$7.00
MS DOS 5.0 Package.....$49.00
3.5" 720K Ad-on Drive.....$59.00
4464 Zip /PCT Mem. Exp. ....$2. ea.

Motherboards/Service Parts

II+,//e Power Supply Exch..$35.00
][+,//e P/S...No Exch.....$45.00
IIgs Power Supply Exch $59.00
IIgs Power Supply No Exch..$79.00
//c Replacement Ext P/S $29.00
//c External Power Supply ..$39.00
//e or //c M/B W/Exch.....$89.00
//e or //c Motherboard.....$129.00
//e Keyboard Exch.....$45.00
II+ Keyboard.....$29.00
II+ Motherboard.....$49.00
//e, //c , / IIgs Case $25./ .$35.00

Refurbished Printers

C-Itoh ProWriter Jr (9 Pin) $84.00
ImageWriter I.....$149.00
ImageWriter I (Wide) $179.00
ImageWriter II $259.00
9 Pin Parallel Printer.....$75.00
IW-I/II Ribbons.....6 for $12.00
Print Heads
IW-I (Exch Only) $35.00
IW-II (Exch. Only).....$79.00
Epson 9 Pin Heads (Most) $59.00
We rebuilt print heads

Accessories

16 Pin Joystick][+,//e $9.95
9 Pin Joystick , IIgs.....$12.95
Mouse Pad (Static Free) $2.95

Cables & Switch Boxes

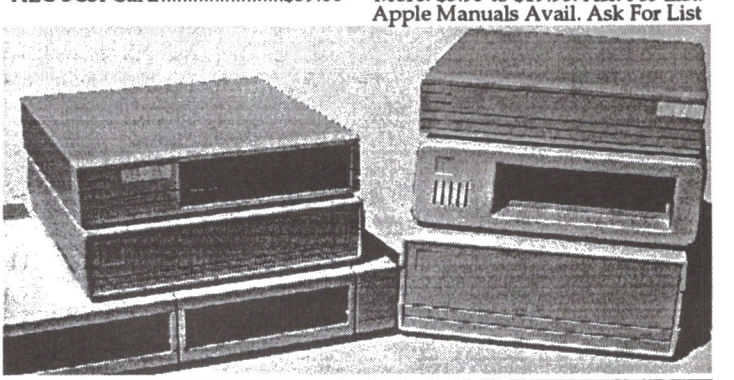
METAL, GBBS Sysops. HST/v.32bis hardware hndshk cables! (Specify)....$14.95
19 Pin Drive Converter.....$14.00
IIgs,e,c to ImageWriter I/II...$7.95
Fullnet Connector $14.95
Switch Boxes..... $19.00 - $29.00
ADB Replacement cable $9.95
SCSI Cable, 25-50 or 50-50.....$9.95

PERIPHERAL CARDS

Zip GS 7Mhz / 32K Cache ..$159.00
Zip Chip 8 Mhz (//e, //c) $139.00
AEC SCSI Card.....$59.00

Manuals & Software

Copy][Plus V.8.x.....$14.95
Misc. Software. Games, Utils, More. $5.95 to $19.95. Ask For List.
Apple Manuals Avail. Ask For List



External SCSI Drive Cases

Build your own SCSI Drive. Cases are refurbished, HH cases hold either a 5.25" or 3.5" drive and open face cases hold any standard 5.25" drive. SyQuest, CD ROM, Etc..... HH Case .....$49.00, Full heigt.....$69.00

Vision Plus Enhanced IIGS $209.00 IIGS

Includes Allison™ Digitizing Software. Real Time Video Digitizer. 30 FPS B&W. Movie Mode & More! Upgrades available for current Vision Plus Owners. Call for details. Allison 1.x to 2.0 Upgrade...$49.95
*2.0 Projected Availabilty Dec '93 Actual Screen Image

Modems

USR 1200 Modem (NEW) $19.00
Hayes SM1200 (Refurb).....$29.00
NEC 2400 Refurb External $59.00
Cable/Modem Combo.. add ..$5.00
Modems include ProTerm 3 Demo.

Bulk Disks

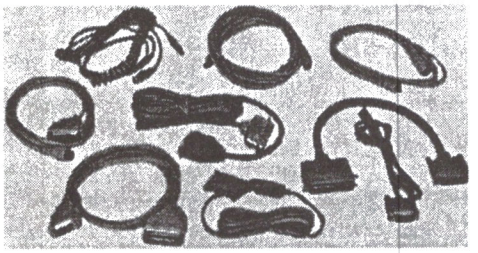
5.25" DSDD Disks 100 for.....$12.00
3.5" DSDD Disks 50 for $14.50
3.5" DSHD Disks 10 for $3.90

ALLTECH ELECTRONICS Co.

602 Garrison St. Oceanside, CA 92054
9-6 PM Mon.-Fri. • 9-5 PM Sat.

Orders Only: VISA MasterCard
800/995-7773

All other Inquiries: & Tech Support: 619/721-7733
Fax (School PO's, Quotes, Info.): 619/721-2823
BBS (FutureNet Site #30) 300-9600v.32: 619/721-0705



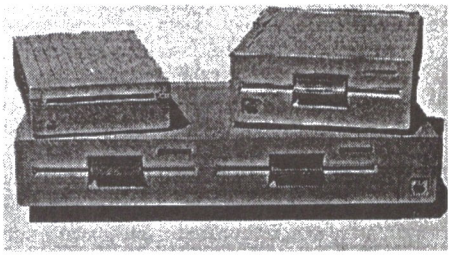
Cables!! Starting at $7.95

SEQUENTIAL SYSTEMS

Sequential Systems RAM-GS 4096K .....$119.
Meg 80 Z (1 Meg, Apple //e).....$59.00
Q:Talk LTO (AppleTalk & 32K for IW-II) ..$69.00
RAM //c with 1024K (//c or //c+).....$119.
bit Mouse card $49.00 ....with mouse.....$65.00
SuperCOMM $54.00.....SuperCOMM /c $45.00

RAM Cards

Apple 1 Meg Memory Exp. with 1 Meg.....$39.00
GS SuperRAM 4 Meg with 1 Meg.....$74.
GS Super RAM w/2 Meg $99.00. 4 Meg$149.
CV Tech Memory Board 4 Meg $205. 5-8Call



Disk Drives

5.25" Generic Full Height w/19 Pin $69.00
5.25" Apple Disk II (Refurb) add $10.00 for above.
5.25" AMR HH (Mac LC, ROM 03 IIgs)...$109.0(
Apple DuoDisk 5.25" Exch.....$129.0(
Apple DuoDisk 5.25" (Refurb) .....$159.0(
Apple UniDisk 3.5" (NEW).....$159.0(
AppleDisk 3.5" (Platinum).....$165.0(
AppleDisk 5.25" (Refurb).....$165.0(
Apple 3.5" 800K Drive Service Exchange $95.00

Monitors

IIgs Compatible (Atari) RGB Monitor.....$149.00
AppleColor RGB, IIgs (Refurb).....$19900
Apple Color Comp or Color 100 (exch) ...$109.00
Apple Color Composite (Refurb).....$199.00
Composite Green (Refurb).....$35.00
Apple Monitor][or /// (Refurb).....$49.00

SCSI Hard Disks

40 Meg External w/AEC Card (Refurb).$159.
80 Meg Ext.....$259.00 w/Apl SCSI .....$359.
SyQuest 44.....$259.00 SyQuest 88. .....$359.
RAMFast SCSI 256K $169.00 / 1 Meg .....$199.
External Drive Cases
SCSI Case & P/S for 3.5" or 5.25" HH .....$49.
SCSI Case & P/S for Full Hight 5.25".....$69.

CA Residents please add 7.75% Sales Tax • COD Orders, Cash/Certified Funds Only • Minimum Shipping & Handling Charge $5.00 (This covers most orders) • Some products are refurbished products and carry a 120 day warranty. • New products are covered by a one year warranty. All Repairs are warranted for 120 days. • Some RAM Chips may be new but pulled, all RAM has a one year warranty. • NO Returns without an RMA number, please call before shipping anything back to us. • A 20% Restocking Fee is applied to all returns due to incompatibility or unneeded product or Products purchased in error. Please be sure what computer you have before placing an order. • Educational P.O.s Accepted, Others on AOC only. • Prices and availability subject to change at any time without any notification whatsoever. *Discounts on certain merchandise only and min. Qty Applies.

Reviews

3D Logo

By Mike Westerfield

Retail price: $95

The Byte Works, Inc.
4700 Irving Blvd. NW Suite 207
Albuquerque, NM 87114
(505) 898-8183

Reviewed by Steven W. Disbrow

I've worked with a lot of computer languages in my time but I must say that I've never seen anything quite like 3D Logo. 3D Logo is a stand-alone implementation of the Logo language that has extensions that allow it to display 3D images and "movies" on your IIGS screen.

What's Logo?

Well, as far as I know, "Logo" isn't an acronym, and it doesn't stand for anything in particular. (This may be a first in computing.) However, in the past few years, Logo has come to be regarded as *the* best way to introduce very young children to the basic concepts of programming and problem solving. Some of the reasons kids seem to love it are that Logo is a very simple language, with the ability to easily create graphics, and it has a "turtle" on the screen. Before you dismiss Logo as a child's toy, though, I should also point out that it is an extremely flexible and extensible language, that it has some amazingly powerful list handling capabilities, and that you can hide the turtle if it embarrasses you.

About That Turtle

As I said earlier, Logo makes it extremely easy to create simple graphics on the computer screen. The "turtle" in Logo is actually just a visual marker of where the drawing pen is on the screen. If the turtle is visible, it appears as a triangle on the screen, so that you can see exactly where the pen will be when you start drawing. The turtle not only shows where the pen is, it also shows the direction the pen will be headed the next time you issue a drawing command. As you use Logo statements to draw, the turtle moves on the screen, showing you exactly what is happening as the drawing takes place. This immediate feedback is probably one of the reasons kids like using Logo so much.

Power Up

As I said before, however, it would be a mistake to dismiss Logo as just a "kid's computer language." Logo is a language that has some extremely powerful features—not the least of which is its ability to build upon itself to create new procedures and functions. For example, to draw a straight line in Logo you simply say:

```
forward 30
```

This simple command starts from the current pen position and draws a line 30 units long in the direction that the turtle is currently facing. Simple. But, suppose you want to draw a box? That's easy too:

```
forward 30
right 90
forward 30
right 90
forward 30
right 90
forward 30
right 90
```

This code does exactly what it says it does: first, it moves forward 30 units, then it turns the turtle to the right 90 degrees. Then it just repeats these steps until the box is complete. But, it can be simpler still:

```
repeat 4 [forward 30 right
90]
```

This is a Logo repeat loop, and as you might guess, it repeats the "forward" and "right" statements four times, thus drawing a box.

Now, if you are going to be drawing lots of boxes, it can be a pain to type this repeat statement over and over. Fortunately, Logo will let you put this statement into a procedure, like this:

```
to square
repeat 4 [forward 30 right
90]
end
```

Then, whenever you need a square, you just say:

```
square
```

Brackets & Lists

In the examples above, notice the brackets "[]" that are used in the repeat statement. In Logo, when you see things between brackets, you are actually looking at a *list*. Lists in Logo are kind of like arrays in other languages, except that they are *much* more flexible. In Logo, a list can contain just about *anything*—including Logo statements (as in the example above), and other lists! This list-oriented approach to programming gives Logo similarities to languages like Lisp and Prolog and makes it a good language for the study of Artificial Intelligence concepts.

Being list-oriented, Logo has lots of ways to manipulate lists and the data in them. Logo makes it easy to create lists, add to them, pull items out of them, print them out, etc. However, one place that Logo fails in list management is when you want to delete something from a list. For that, you have to write a special procedure. Not too difficult to do, but this is a surprising omission for a language that is so dependant on list manipulation.

The Naughty List

While the list-centered approach of Logo can be very powerful, it does have its drawbacks. The main problem is that, because you have to place some of your code in these lists, Logo code can become *very* hard to follow as you are trying to write and debug it. For simple statements, it isn't so bad. But when you try to use Logo for complex calculations, or if you try to implement something fairly easy to do in another language (like nested "if" statements), the code quickly becomes a nightmare to follow. See Figure 1 for an example of what I mean by this.

Of course, there's a lot more to the Logo language than what I've discussed here, but those are the basics. Now that we've discussed the Logo language in general, let's look at 3D Logo in particular.

3D Logo

First of all, 3D Logo is *not* a language that you can install in your ORCA shell and use along with ORCA/C or any of the other ORCA languages. 3D Logo is a stand-alone, *interpreted* language that exists in a world all its own. This was a big disappointment for me personally—I was really looking forward to having access to the list manipulation features of Logo in my desktop programs. (However, I can understand why 3D Logo is not a regular ORCA language—the run-time package to support all of the features of Logo would probably be huge!)

Speaking of desktop applications, you *can* use 3D Logo to create desktop applications. However, these actually require the presence of the 3D Logo

Figure 1
A Nested If Statement In Logo

```
![there is no case structure in Logo   ]
![so we use a nested if to simulate it ]
![First, we set val to a value between ]
![zero and five, then we test its value]
![Note that "make" is the Logo version ]
![of an assignment statement.          ]
make "val random 6
if :val = 0 [print [Zero]] [if :val = 1 [print [One]] [if :val = 2 [print
[Two]] [if :val = 3 [print [Three]] [if :val = 4 [print [Four]] [print
[Five]]]]]]
```

application to run properly. Also, these desktop applications are severely limited in the types of windows they can create and the types of controls you can put in these windows. In fact, I don't think you can create or manipulate *any* of the standard IIGS controls (radio buttons, pop-up menus, etc.) in a window created with 3D Logo. Still, the ability to create even these limited desktop applications is a very nice feature, and it may be just the thing to get some IIGS owners interested in writing applications for the IIGS.

The Environment

Since 3D Logo isn't an ORCA language, you can't use it under the ORCA shell or Prizm. Instead, you work with 3D Logo in a standard desktop environment. When you first start up the program, one window shows the turtle, and another shows the Logo commands that you type in (see screen shot). To enter a Logo command, you simply type the command and press the return key. 3D Logo executes your command immediately and places any procedures or functions you have defined into the Logo workspace. The workspace is a very important place in Logo, because that's where Logo stores all of the procedures, functions and variables you have defined.

As your Logo program grows, you'll probably want to save it out to a file so that you don't have to type the code over and over again. To do that, you can either pick the Save item from the 3D Logo menu, or you can use the Save file command that's built into Logo. To load the code back in later, you just pick the Open item from the menu or use the Load file command. Fairly straight-forward right? Well, if you use the Open item, that's not all you have to do to actually *use* the code you just loaded back in.

When you open a saved Logo source code file using the Open menu item, 3D Logo doesn't actually do anything with the code you just loaded. As far as 3D Logo is concerned, it is just a text file that you have opened to look at. To actually use that code, you have to get it into the Logo workspace. To do that, you have to select all the code (either using the mouse or by using the Select All menu item) and then press the return key. While this is covered briefly in the manual, it is not exactly the most intuitive procedure in the world. If you have got your Logo program broken up into several files, it is a real pain to have to open them one at a time, and then enter them into the workspace by doing a Select All and pressing the return key. A better way would be to have a preference that would tell 3D Logo whether or not to always try to enter the files you open into the workspace.

Speaking of splitting your program up, this is a good place to note that, while 3D Logo does have a Window menu that allows you to select a particular window, it does not provide any means of tiling or otherwise organizing all of the windows you open. This can lead to a very cluttered screen and more than just a little confusion.

This is also a good place to note that the 3D Logo editor is also without any sort of find and replace functions. While I suppose that this will not be missed by the younger kids using 3D Logo, I think, and I'm sure that more experienced programmers would agree, that this is something that should be included in every programming environment, regardless of who the intended audience is.

Making Movies

One of the neater features of 3D Logo is its ability to make "movies." Now these are not QuickTime-quality movies, they are just frame-by-frame animations of the things that you create with 3D Logo's drawing commands.

To make a movie, you open a special movie window, and then begin drawing your first frame. When the frame is complete, you use the Logo command `Addframe` to add a new frame to your movie. You can then draw in this new frame just as you did the first one. After you have all of your frames drawn, you can use the controls in the movie window to play back the frames one after the other. 3D Logo allows you to change the playback rate (anywhere from 1 to 10 frames per second), whether or not to use the full screen when playing the movie, and whether or not to play the movie over and over. You can also step through the movie one frame at a time either forwards or backwards.

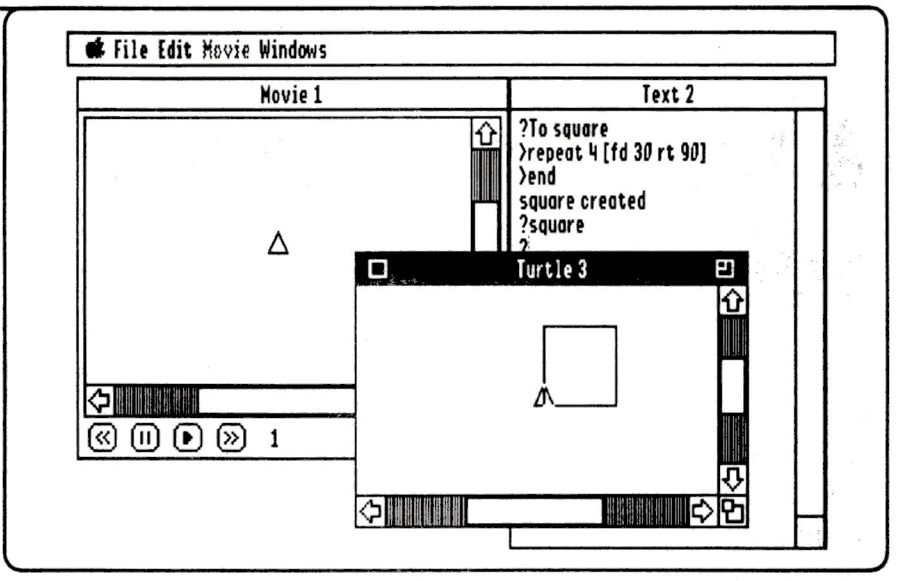
Best of all, you can save out the movies you create as standard Paintworks animation files. These files can be played back using most paint programs, and even by HyperStudio.

Speaking of HyperStudio, if you are a HyperStudio user you might be interested to know that 3D Logo started out as the scripting language for HyperStudio on the *Macintosh*. It turned out so well, that The Byte Works decided to port it to the IIGS as both a stand-alone product (which is what 3D Logo is) and as a plug-in language for HyperStudio for the IIGS. The HyperStudio IIGS version is still in the works, but it should be available soon. The neat thing about all this is that, whatever you write with 3D Logo should be very easy to move to Logo for the Macintosh! So, if you decide to take the time to learn Logo with 3D Logo, you've automatically got access to two very large markets for your Logo programs: the HyperStudio market on the IIGS (which is already huge) and the HyperStudio market for the Macintosh (which is getting larger every day).

The Manual

As with every programming language, the

manual is a very important part of the 3D Logo package. Fortunately, as with just about every other product from The Byte Works, the 3D Logo manual is excellent. It does *not* assume that you already know Logo and goes out of its way to teach you the basics of the language. In fact, most of the manual is taken up with detailed descriptions of each 3D Logo command. This is a nice change from the manuals for other Byte Works language products which just assume that you already know (or are willing to learn on your own) the language in question. The only complaint I have with the manual is that the Logo Command Summary in Appendix A does not include page numbers for the descriptions of each of the commands. However, it's a simple matter to write these down in the manual yourself as you look up each command.



"3D" Logo?

Well, I've just about finished this review, and somehow I've managed to completely avoid discussing the "3D" in 3D Logo. One of the reasons for this is that it's so simple to do that you kind of take it for granted! Anyway, I'm not going to discuss *how* the 3D display works (the manual does an excellent job of that), I'm just going to discuss how you use it in 3D Logo. (For those of you that are curious, the 3D Logo package *does* include a pair of those red-and-blue 3D glasses that you may have worn at a theatre once or twice in your life. And, yes, you *do* have to wear these glasses while looking at the screen to get the full 3D effect.)

Basically, the concept behind 3D Logo is that, if the turtle can be told to face left, right, up and down *on* the screen, why can't it be told to face *into* and *out of* the screen? Actually, there is no reason why it can't, so that is exactly what 3D Logo lets you do! You just tell the turtle to `Rotatein` or `Rotateout`, and then you use the standard drawing commands to draw your pictures in three dimensional space. 3D Logo takes care of the drawing perspective for you, so all you have to worry about is the actual placement of what you are drawing.

As you might expect, you can combine this feature with the ability to make movies, which can lead to some *very* interesting effects on screen. The 3D Logo package comes with a couple of extremely cool 3D demo programs, one of which shows a representation of a complex molecule spinning in space. (If you are thinking that this sounds like a great tool for kids taking a junior high or high school chemistry class, then you're right!)

Just a Couple of Bugs

3D Logo is an amazingly solid product. In the two months I've been using it, I've only found three problems that could be classified as "bugs."

First of all, the sample desktop programs seem to have some problems when you try to print from them. If you cancel printing from one of these programs, they will usually report an error and then abort.

Second, if you are using the 3D drawing mode and you are in 640 mode (Did I forget to mention that you can run 3D Logo in both 320 and 640 modes? Sorry about that!), when you turn 3D drawing mode *off*, the menu bar will get messed up. However, this is merely a cosmetic problem—you can still use the menu bar with no problems.

Finally, there is a very insidious bug in version 1.0 of 3D Logo that everyone needs to be on the look out for. Namely, when you type in your procedures, be *sure* that you *don't* put *any* blank lines between your Logo statements. If you do, the 3D Logo interpreter will go just a tad crazy and start giving you all sorts of bizarre error messages. I've informed The Byte Works of this problem and they tell me that it will be fixed in the next version of 3D Logo, but, until then, just avoid sticking blank lines in your code.

Conclusion

3D Logo is an extremely stable language that is hampered only by a somewhat cumbersome environment, and its inability to mix with other IIGS languages. So, if you are a serious IIGS programmer, you should probably stick with your current language. However, if you are a language junkie, or if you have an interest in playing around with Artificial Intelligence, you should probably pick up a copy of 3D Logo.

If you are a *user* that wants to test the waters of computer programming, 3D Logo is a pretty good way to get your feet wet. However, if you are trying to answer the question "Do I want to program for a living?" I would probably recommend ORCA/Pascal and the Learn to Program in Pascal tutorials instead. The Logo language just isn't something that you will encounter very often in "the real world" of computer programming for hire.

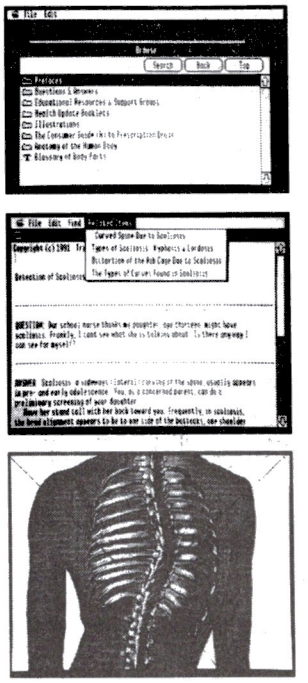
Finally, if you have a youngster that you want to introduce to programming, 3D Logo is a *great* product to do it with. It's fun to use, flexible, powerful, and your kids are probably *already* using Logo in school—and loving it. Just imagine being able to get them to actually use the computer and have them actually learn something that might improve their grades! ***GS+***

A World of Information for your Apple IIGS...

Sequential Systems would like to introduce you to DiscQUEST™ , your access to the exploding world of information now available on CD-ROM. Lately, you've probably been hearing a lot about the world of Multi-Media CD-ROM and perhaps you assumed that you and your Apple IIGS were just out of luck. **NOT!**

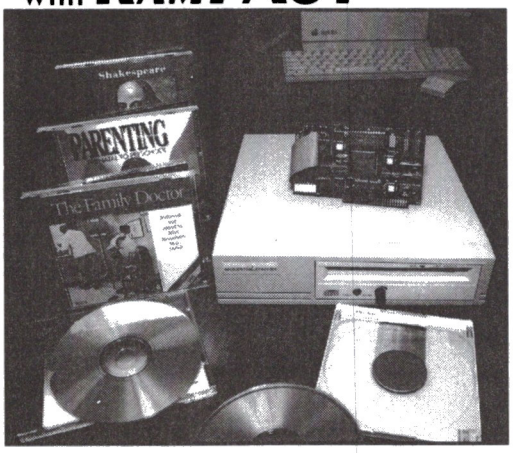
With DiscQUEST™ software by Sequential Systems, you now can access literally **THOUSANDS of MEGABYTES** of Text, Graphics and Audio data currently available on CD-ROM. And since **DiscQUEST™ uses Standard, Off-the-shelf CD-ROMS for MAC & MS-DOS, and a standard SCSI CD-ROM drive**, your investment in Multi-Media will be intact for virtually any computer you'll be using down the road!

With DiscQUEST™ you can quickly search by word, title, author, graphic, etc. from thousands of articles on many popular CD-ROM titles like Creative MultiMedia's "Family Doctor" & "Parenting" or Bureau Development's "Great Literature" series. (Call us for a complete list of supported titles.) Buy DiscQUEST software for your CD-ROM system or buy our DiscQUEST™ Bundle, which includes DiscQUEST software, an auto-eject CD-ROM Drive, 4 CD-ROM titles, and our RamFAST™ SCSI interface for Apple IIGS and you'll be searching through GigaBytes of data faster than a MAC LCII!



(Actual screen shots from DiscQuest™ and "The Family Doctor")

With **RAMFAST™**



A World of Information for Your Apple IIGS... AND YOU!

discQuest™

SEQUENTIAL SYSTEMS

Focus Drive Hard Card

Software and Firmware by Bill Heineman
Hardware by Steve Parsons

Price:
20 MB: $229
40 MB: $329
60 MB: $379
80 MB: $429
120 MB: $569
160 MB: $664
213 MB: $741

[Note: These prices do not reflect the 10% discount that *GS+* Magazine subscribers are entitled to if they mention the fact when they order. User groups and schools are entitled to further discounts (at least 5%). For more information, contact Parsons Engineering.]

Available only from:
Parsons Engineering
5010 Rimhurst Avenue
Covina, CA 91724
Sales/Service: (818) 966-5538
Fax: (818) 966-5701

Reviewed by Bill Moore

Perhaps you've decided (after all the not-so-subtle hints we scatter around every issue of *GS+* Magazine) that it's time to finally buy a hard drive. However, some things about hard drives confuse, perhaps even scare you. SCSI? Termination? Formatting? Partitioning? None of these terms sound even vaguely familiar. If this is the case, and you're not looking for a drive you can (God forbid) take to another platform, then a hard drive's come along that's so simple, my grandmother could set this thing up in a IIGS and begin using it. For my grandmother, to whom George Burns is "that nice young man," and a microwave is high technology, this would be a major achievement. This drive is the "plug-n-play" Focus drive from Parsons Engineering.

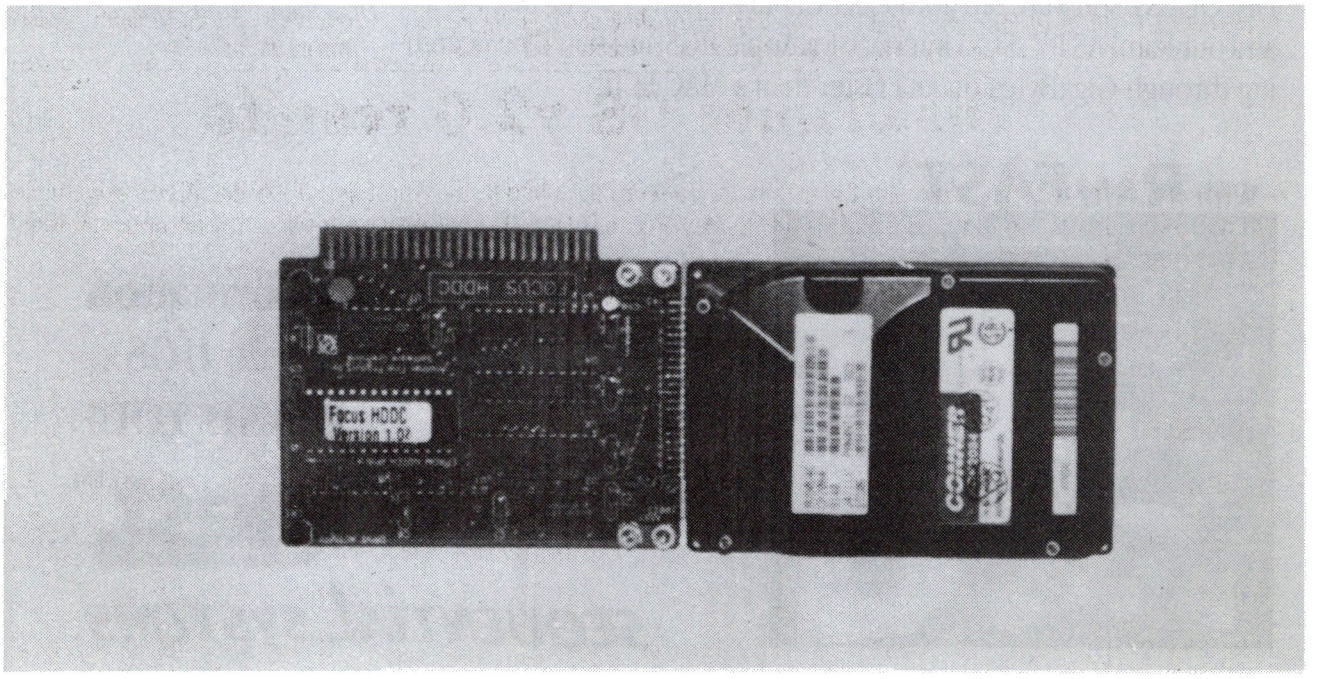
"Plug-n-play"?!

This type of hard drive is one of three major types of hard drives available for the Apple IIGS. External SCSI drives are the most common, but there are also internal drives for the IIGS. Along with "hard cards" like the Focus drive, there were also internal units that replaced the power supply, such as the Pegasus from Econ and Vulcan from Applied Engineering. Of internal disks, I like the hard card concept best because it draws the least power (the drive mechanisms used by the Focus drive were intended for use in PowerBooks—so they were designed to use as little power as possible), and there's no muss, no fuss. You plug the card in any available slot (except 3), set the control panel to startup from the proper slot, and off you go. No wondering if the drive's properly terminated, or has the proper driver (it's included), or any of several other things you have to fret over when setting up other types of hard drives. The entire setup (counting opening the package) can be done in under five minutes, (ten, if your desk is as messy as mine), and then you've joined the wonderful world of hard drives!

Aside from the simplicity of setup, another benefit of this hard drive it that it's fast. For statistics nuts, there's complete readouts from Disk Timer GS v2.0 in the sidebar for this drive and several others. Looking at how the Focus drive compares to other drives, I'd have to say that the Focus drive can roar down the highway, but doesn't handle really well in city driving. By that, I mean that the Focus drive's numbers for the multi-block read test and seek test were at least twice as bad as any comparable SCSI drive. It did, however, blow the doors off the competition in the read and particularly the adapter test. But in real-world work, this drive is unobtrusive, and speedy. Adding one of these cards and a TransWarp GS or a Zip GS, and it feels as though you have a whole new computer. I really can't stress enough how much more productive you can be with a good hard drive attached to (or in) your IIGS.

But Should it Be This Drive?

Well, it's a nice unit, but it's not perfect to me. One gripe I have is the cost of this unit. I'm aware this isn't the fault of Parsons Engineering (after all, the bulk of the cost is for the 2.5-inch drive mechanism, which is more costly than other types of hard drives,) but it's still a big factor. Add up the cost of a RamFAST SCSI, and an external hard



drive with a 3.5-inch mechanism, and you'll come out cheaper than the equivalent size Focus drive. One thing that helps here is the fact that *GS+* Magazine subscribers get 10% lopped off the cost. If you're part of a user group or school, you can get additional discounts. With the discounts, the price drops down to a level consistent with the pricing of external SCSI units, with the added benefit of more desktop space available.

My second gripe concerns the expandability of this unit. Namely, there is none. I know this card uses an IDE drive, so it isn't possible to make a card that controls an IDE disk *and* has a SCSI port to act as a SCSI controller card. But I can dream, can't I? However, this card is for folks who don't want to bother with SCSI in the first place, so expandability may not be an issue for them. Although there is no way to expand the drive, that doesn't mean you can't upgrade. For a period of one year after purchase, Parsons will buy back your drive mechanism at favorable rates. This will enable you to buy a bigger hard drive at a reduced price. Contact Parsons Engineering for details.

Well, What *Do* You Like?

Mariah Carey. Oh, what do I like about the Focus drive? A lot of things. The drive shows up completely partitioned, formatted, and ready to go. System 6.0.1 is included, along with the Focus drive control panel, and the custom driver it needs for optimum performance. A utility disk is included, which has these programs (plus a custom disk formatter) if something should happen to the drive. Approximately 30MB of shareware and freeware is included, assuming you have the disk space. (In other words, if you order a 20MB drive, they're not going to fill it completely with shareware!)

A lot of things on the technical side are appealing about the Focus drive. Since the card only draws half of an amp of power, *maximum*, you need not worry about overloading your system. Most hard drives draw more power while idling than this drive's peak draw. I'm not surprised; who'd want a notebook with a power hog of a hard drive? At least two—possibly more—Focus drives will fit inside a IIGS without taxing the power supply, assuming you have the slots to spare.

Earlier, I mentioned that a control panel was installed for the Focus drive. This control panel takes advantage of some of that notebook hard drive technology. Written by none other than "Burger" Bill Heineman, the control panel allows you to specify a set amount of time before the Focus drive spins down ("sleeps"). You can specify a delay of anywhere from 1 to 10 minutes of inactivity, or select "Never" to keep the disk ready at all times. I really like this feature, because not only does it prolong drive life, it keeps the drive from going all the time if you have it in, for example, a computer running a BBS. It also powers down the drive concurrently with a screen saver. So, if you leave the computer alone long enough, the hard drive will spin down and Twilight II will kick in. The down side to putting the drive to sleep is that it takes anywhere from five to ten seconds for the drive to get back up to speed. This can really slow down going into or getting out of a screen saver. The first time this happened, I thought the machine had crashed!

The manual is a well-written one as hard drive manuals go. It glosses over the installation process a bit, but then, if you've installed any kind of expansion card in an Apple II, you can install a Focus drive in a IIGS. This manual mainly covers other parts of owning a hard drive that most people leave you on your own to figure out. Topics like copying software to the drive, the importance of backup, and how to use and install the included drivers and utilities if you have to reformat the drive. This chapter will be a godsend for folks who have trouble with their drive and aren't a "digital deity" who can handle three such problems before lunch every day. If you do have any kind of trouble with the Focus drive, the last section of the manual covers common problems and gives solutions. Be sure to read this section if things with your Focus drive aren't rosy.

Conclusion

If you're looking for a unit that's incredibly easy to set up, I'd highly recommend the Focus drive. This thing is so simple to install, a football player (many of whom posses slightly more intelligence than small waterfowl) could get it going in record time on a IIGS. This unit is a great all-in-one solution to add a hard drive to your IIGS. For anyone who currently doesn't have a hard drive and wants one without the hassles of SCSI, drop this magazine right now and order one. If you already have a SCSI hard drive, I don't see what this drive offers that you either don't already have or can get *much* cheaper. *GS+*

DiskTimer GS v2.0 results

All drives except the Zip Drive and the Focus Drive were attached to an Apple High-Speed SCSI card (these drives are not SCSI drives, and are attached to their controller card). All readings were taken on an unaccelerated IIGS. (Lower numbers are better.)

	Read	Multi-block Read	Seek	Adapter
Focus Drive 80	13	61	61	07
NCS Pro 240	37	24	52	21
Q-Drive 40	45	66	76	28
Zip Drive 40MB	15	62	65	09
Pegasus 100i	31	23	19	21
Shadow 105MB	36	26	22	21
TMS 105 Pro	33	24	21	20
Tulin Half Shell	36	24	68	22

Prism v1.0

by Ronald E. Mercer

Typical mail-order price: $39.95

New Concepts
224 W. Judd St., Suite 2
Woodstock, IL 60098
Phone: (815) 338-4227
Fax: (815) 338-4332

Reviewed by Bill Moore

If you're into scavenging files for your IIGS, one of the major things you're probably after is graphics. Many ways exist to move graphic images from one computer to another, including the well-known Graphic Interchange Format (GIF). Several programs exist for the IIGS to allow one to move graphics to or from your IIGS. Some of the best-known programs in this area include SuperConvert by Seven Hills Software, and The Graphics Exchange by Roger Wagner Publishing. Into this arena steps Prism.

Prism is the newest product of New Concepts, sister company of LRO Computer Sales. Prism is a utility to allow one to convert graphics from any of several formats into IIGS grayscale, 16, 256, and 3200 color images at 320 resolution. At 640, you can save an image as grayscale or in 16 color dithered mode. Among the many formats Prism will allow you to load include Tagged Image file format (TIFF), Interchange File Format (IFF) for the Amiga, Graphic Interchange Format (GIF), and of course all Apple IIGS native formats, including a few weird ones such as all three 3200 color formats, and raw data files from the digitizers Allison, Visionary, and ComputerEyes GS. While this is a very impressive list, I feel there are a few missing. Three glaring omissions to me include Macintosh PICT files, MacPaint files, and Windows .BMP files. With the brave new world of multiple FSTs, IIGS software authors are gonna have to start making better use of the System Software's built-in abilities. I've spoken with New Concepts, and they expect to add the ability to import these filetypes in the next release of Prism.

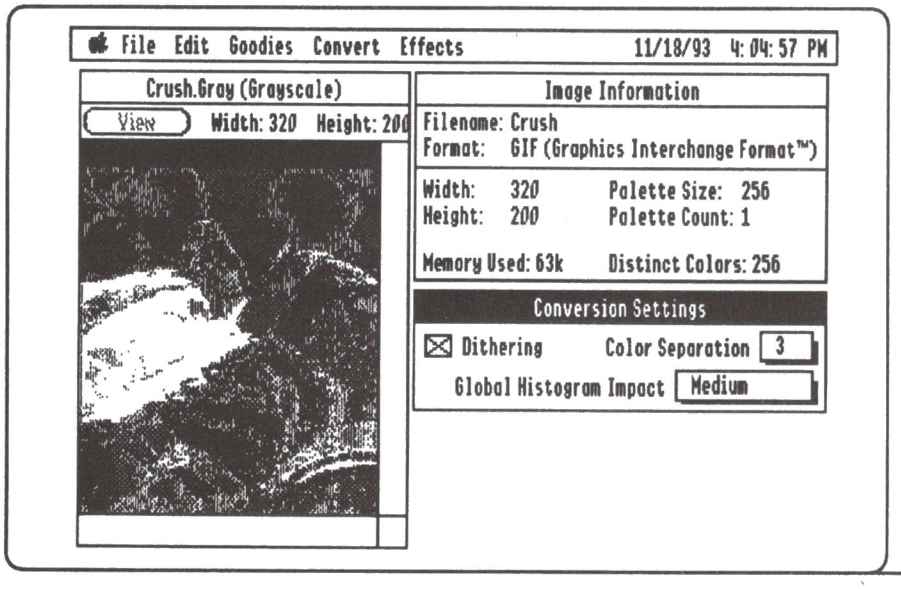
Once you have a file loaded, Prism offers you many options on conversion. In order to see how the file *really* looks, Prism offers a way to view a narrow portion of the image the way it's supposed to look with all its colors and at full resolution (at least, within the limits of the colors available on the IIGS). This mode is called "View True Color," and it's a very handy tool for making sure a conversion looks the way it's supposed to. The Prism manual offers an excellent tutorial on how to use this feature, along with most of Prism's other useful tools.

Take a look at the screen shot from Prism's main screen. Notice the window "Conversion Settings." This window's controls ("Color Separation" and "Global Histogram Impact" pop-up menus, along with a checkbox for "Dithering") are the two most important aspects of Prism. How well a converted image looks directly depends on the settings of the options in this window. Dithering lets you decide if you want Prism to simulate more colors by putting two different colored pixels next to one another. To use the example from the Prism manual, by dithering black and white, you get gray. For most conversions, dithering will improve the end product you get on the IIGS.

The Color Separation pop-up menu tells Prism what to do with colors that are very similar (or close in value). By selecting a lower number, Prism will allow more colors of similar value into the converted document. If you select a higher value, you are in effect telling Prism to make sure that colors aren't very much alike before they are allowed into the converted image's palette. The settings can range from Off to 7. At a setting of Off, Prism will only take the most-used colors. At a value of 2, it skips every second color, at 4 every fourth color, and so on.

The Global Histogram Impact pop-up menu is where much of Prism's strength lies. A histogram is a way to measure the amount of a particular color in a graphic image. For example, if I had a full-screen shot of the Apple logo, the colors used (green, yellow, orange, red, purple, and blue) would have high histogram values. If the logo were on a black background, then black would most likely have the highest histogram value of any of the colors in the picture. Prism uses two types of histograms, global and local. Every line of an image has a local histogram, while the global histogram applies to the entire image. The Global Histogram Impact pop-up menu sets the relationship between these two. If the impact is set to a lower value, the local histograms will take precedence in the final image. If you have a large quantity of a single color in one particular area of an image, raising the Global Histogram Impact setting will make Prism give that color less priority. An example would be the color green. In an overhead shot of New York City, you could raise the Global Histogram Impact setting to High or even Maximum, since the only green in the shot would probably be Central Park. In a shot of David Letterman's wallet, green would presumably be everywhere (given the money he makes), so you'd set the Global Histogram Impact setting to something low, like Minimum or Off so the local histograms affect the final conversion. This would ensure that the conversion was more than just a green blob of color on your screen.

Now for the things that I am less than pleased with about Prism. The first problem is annoying, but not especially serious. Sometimes while working inside Prism, "cursor droppings" will accumulate around the screen. This is similar to the problems I've had using Cool Cursor, except that I've had this problem with Prism after shift-booting! The second problem occurs when you work with an interlaced GIF that is bigger than the screen. When you tell Prism to resize the image, lines appear in the remapped image, ending its usefulness. New Concepts is aware of these problems, and



intends to address them in the next release of Prism, slated for release in mid to late-January 1994. Another thing that irritates me about Prism is the slowness of converting a graphic into 3200 color format. I've tried converting on two different machines, both ROM 01 models with a TWGS, and on each machine, even a small GIF file takes nearly five minutes to convert! Apparently, 3200 color conversions are done a line at a time, thus, the bigger the file, the longer the conversion. When New Concepts does the rewrite for Prism, I wish they'd look at these routines to see if they can't be sped up somehow. I can only imagine how long the wait would be on a regular IIGS.

Some of you are probably wondering how Prism stacks up to the competition. I am only qualified to write about how it rates next to SuperConvert v3.01, since that's the only graphics utility I've had lots of quality time with. The general impressions I have are that Prism is more specialized—it loads a few formats and does an excellent job in converting them. SuperConvert is many times more flexible than Prism, particularly in the different formats it can load and save. SuperConvert will open pictures in several different computer formats, including old Apple II formats, many IIGS formats, Macintosh and IBM PC files. As the old saying goes, however, Jack of all trades is master of none. SuperConvert, for example, will not save in 256 or 3200 color format. Prism has no save options other than an Apple IIGS format of some kind. SuperConvert allows the creation of GIF or TIFF images so you can share graphics with friends and co-workers who use other heathen machines. I feel that both programs are needed for maximum flexibility.

Conclusion

There are three different types of people that I see as being interested in Prism. If you're looking for a graphics utility to convert files from other machines into high-resolution formats (256 & 3200 color modes), Prism would be a good choice. If you have SuperConvert or The Graphics Exchange, and you're looking for something to *replace* your current graphics conversion utility, I think you're out of luck. If you don't have *any* type of converter, my recommendation would be to get Prism along with another program, such as SuperConvert. Prism is at its best in a role to compliment your current utility. Prism is not flexible enough to replace SuperConvert in my opinion. I can do things with either program that simply cannot be done with the other, like load a double hi-res image into SuperConvert, or save an image in 3200 color format in Prism. So, to wrap this up, I'd say that Prism is a fairly good program now that will get *much* better if everything that's promised in the upgrade shows up. Get it if you're interested in graphics, but get something else (such as SuperConvert or TGE) for more general work. ***GS+***

Moving?

Well, don't forget to tell us! The Post Office does not normally forward Third-Class mail (they simply destroy it!), and we can't afford to replace magazines that were lost because a subscriber forgot to send us a change of address! If you miss an issue, we will extend your subscription, but you will have to buy the missed issue as a back issue! So, to avoid this hassle, send us a change of address as soon as you know your new address!

If you want, you can phone in your change of address by calling (615) 843-3988, or you can e-mail it to us at one of the following addresses:

America Online or Delphi: GSPlusDiz
GEnie: JWankerl
InterNet: GSPlusDiz@aol.com
Newton Mail: Diz
(Be sure to include your old *address when e-mailing us a change of address!)*

Or, if you prefer to do things the old fashioned way, simply remove your mailing label from a previous issue of **GS+** *Magazine, affix it to a change of address form (available at your local Post Office), fill in your new address, and send it to us at:*

GS+ Subscription Services
P. O. Box 15366
Chattanooga, TN 37415-0366

Tulin Floptical Disk Drive

Retail price: $399.00 (+ 13.00 S/H)

Available only from:
Tulin Technology
2156H O'Toole Avenue
San Jose, CA 95131
(408) 432-9057

Minimum system requirements: SCSI interface card, System 6 (if using the Apple High-Speed or Revision C SCSI card).

Floptical Diskettes:
capacity (formatted): 20.2MB
price (each) : $21.00 (from Tulin)
price (for 5): $99.00 (mail order)

Reviewed by Wayne Sheffield

So, you're intrigued with the idea of a floptical disk drive. You know that (somehow) it has a capacity of 20+ megabytes. You may have heard that it works with 1.44MB disks. You may have even heard that it does *not* work with low capacity disks. What's a person (that has to have the latest computer equipment) to do? First, lets try getting some accurate information!

What Is a Floptical Disk Drive?

The Tulin Floptical disk drive is a disk drive that reads, writes and formats standard DS/DD disks (720K capacity), DS/HD disks (1.44MB capacity), or VHD (very high density) disks (20.2MB capacity). The drive is a SCSI drive, which means that it requires a SCSI interface card.

When reading/writing to a VHD diskette (which, incidentally, has translucent media), the drive mechanism utilizes special tracks on the diskette to optically position the heads, which will then magnetically read/write from/to the diskette. The preciseness of this optical positioning is what enables these diskettes to have such a high capacity. Note that the manufacturer specifies that the VHD diskettes be formatted by using the partition option of Apple's Advanced Disk Utility (which is included with the IIGS System Software).

The floptical disk drive does not format, read, or write 800K diskettes, therefore it is not compatible with your old 800K ProDOS or HFS disks. If you are using a SuperDrive (on either a Macintosh, or on your IIGS with the Apple II SuperDrive Controller card [see review in *GS+* V5.N1]), the 1.44MB disks created by the floptical drive are compatible with these configurations.

From my testing, the floptical operates at roughly 1/3 the speed of my hard drive (which has an access time of less than 10 ms); it operates at roughly three times the speed of my Apple 3.5-inch disk drive.

How to Use This Thing

To use the floptical disk drive, you merely attach the device to your SCSI card (or somewhere within your SCSI chain). You can order the drive with the terminating resistors removed, so that the device can be placed anywhere in the chain. However, if you do order the drive without the terminating resistors, you need to ensure that either the last device in the SCSI chain does have terminating resistors installed, or that you use an external terminating resistor pack. If you order the drive with the terminating resistors installed (its normal configuration), it must be the only device on your SCSI chain with termination resistors (except for the SCSI card itself); furthermore it must be the *last* device in the SCSI chain.

After attaching the drive, installing the device driver (if needed), and starting your computer up, GS/OS will be able to access the floptical drive. It works just like any other disk drive does, including the generation of System 6 sound events when media is inserted or removed from the drive.

The drive comes with System 6 (probably System 6.0.1 now) pre-installed onto one of the supplied floptical diskettes. If the drive is the first SCSI device, it can be the boot drive from one of these diskettes. (If you have a hard drive and the floptical, I recommend that you set your SCSI ID numbers to 5 for the hard drive, and 4 for the floptical. This will allow you to normally boot up from the hard drive, but by merely changing the floptical's ID to 6 [with the computer off, of course!], you can boot up from the floptical.)

Using the Floptical With FSTs

With the advent of the HFS FST, this drive will format, read, and write disks with the HFS file system. However, only the 1.44MB disks can be exchanged with the Macintosh or other computers capable of reading this particular type of file system. Since the drive only formats DS/DD disks with a capacity of 720K, this type of diskette is not compatible with standard Apple drives that work with double density disks at 800K.

With the MS-DOS FST, this drive will read 720K and 1.44MB MS-DOS disks.

Use With Other Computers

Since the floptical disk drive is a SCSI device, it will also work with a Macintosh computer or IBM compatible computers with a SCSI card. This drive will substitute in an IBM computer as a 3.5-inch disk drive—it even has the same physical measurements.

System Requirements

If you are using a RamFAST card, you need to ensure that your RamFAST ROM revision is version 3.00L or later (3.00L was released some time ago, so if you recently bought your RamFAST, this should not be a problem). Previous revisions would allow you to eject the diskette without all the data having been written to the disk (this makes corrupted files a regular occurrence!). Note that if you are using a RamFAST, this drive can also be used in the Apple IIe computer.

If you are using the Apple High-Speed SCSI card, you will need to use a special device driver which requires System 6 (and thus, a IIGS). This device driver is supplied with the drive and it replaces the **SCSIHD.DRIVER** file in your ***:System:Drivers** folder.

Regardless of the SCSI card used, you will need to turn off the DMA (direct memory access) feature of the card if you have any other cards in your system that use DMA (such as an accelerator or memory card).

What Would I Use This Thing For?

Well, how about . . .

1. Backing up your hard drive (backing up 20MB to one 20MB disk is a lot easier than to 26 regular 3.5-inch disks!). To save even more space, instead of just copying all of your files over, try using ShrinkIt-GS to shrink all of the files/folders from the root directory of each volume to the floptical diskette. Utilizing this method, I can store two 20MB partitions of my hard drive onto one floptical diskette.

Floptical Drive Technical Specifications

Mechanism:	Insite Floptical		
Disk Type:	VHD	HD	DD
Average access time:	80ms	68ms	68ms
Transfer Rate (per second):	200K	75K	150K

2. Ability to read IBM disks (and *write* them with a PC Transporter)—this will enable (most) people to bring their work home.

3. Backing up your hard drive.

4. Exchange large data files with your Macintosh owning friends (or from work).

5. You can use this *as* a hard drive—it has even more capacity than the first hard drives Apple made! It even has enough space for a heavily software enhanced System 6, complete with tons of fonts and sounds. Run out of disk space? Just get another floptical diskette and your hard drive just "grew" by another 20 megabytes!

6. Backing up your hard drive.

Drawbacks

The only negatives that I have found with this drive are:

1. It is incompatible with 800K formatted disks. This incompatibility requires me to keep a standard Apple 3.5-inch disk drive hooked up.

2. Its random refusal to format disks when using the PC Transporter (see sidebar "Using the Floptical Disk Drive With a PC Transporter").

Conclusion

The floptical disk drive is the premier disk drive for exchanging data across computer platforms—especially if you own a PC Transporter. For IIGS owners with a hard drive, the ease of performing a backup is sufficient reason to buy a floptical disk drive. For IIGS owners without a hard drive, this could *be* your hard drive! With it's benefits as a "poor man's hard drive," [Just remember that there are regular hard drives out there that do cost less—Ed] high capacity, relatively low cost of media (20MB of DS/DD disks will probably cost you more than $20), compatibility with other computers types (both hardware and data exchange), and it's convenience in making hard drive backups, I would recommend that all IIGS owners give serious consideration towards purchasing one of these units. When you consider that this unit costs just $70 more than the Apple SuperDrive, this is $70 worth spending. Furthermore, unlike the SuperDrive (and SuperDrive compatibles), this unit will suffice as a replacement for a hard drive. *GS+*

Using the Floptical Disk Drive With a PC Transporter

The floptical disk drive does work with the PC Transporter, supporting the 720K and 1.44MB disk capacities. Unfortunately, I have not yet been able to get the drive to support 21MB disks from the IBM side.

To use the disk drive with the PC Transporter, the drive must be assigned to a ProDOS slot and drive. If you are using a RamFAST/SCSI interface card, this is handled automatically for you—just run the **RamFAST.System** utility to determine which slot and drive the floptical has been mapped to. However, if you are using the Apple High-Speed SCSI card, you need to have a ProDOS disk in the drive the *first time* you run a ProDOS 8 application. This will cause ProDOS to map the device to a slot and drive. Since this is a SCSI drive, if there is no ProDOS disk in the drive, ProDOS 8 will ignore the SCSI device until the computer has been rebooted. If you do not know what slot and drive the floptical has been mapped to, you will need to go to BASIC and determine where it is by typing "prefix, sS, dD" where s is the slot number (from 1 to 7) and D is the drive number (from 1 to 2). Then use the "catalog" command to see if the floptical is assigned to that slot and drive. You should systematically use different values for "s" and "d" until you find the slot and drive the floptical has been assigned to. (Or, you can simply run the AppleSoft BASIC program that I have written to do this for you. It's called **SlotList.BAS**, and it's on your *GS+* Disk in the **Programs** folder.)

Once you have found out what slot/drive the drive is mapped to, you can go ahead and run the PC Transporter software. You will need to configure your disk drives from the AEPC control panel. Configure the drive as a ProDOS device, and, when prompted for the slot/drive, enter the slot and drive numbers determined from above.

While in the PC Transporter, I have noticed that it will format disks pretty much however it feels like. I have seen it format disks with capacities of 1.0MB, 1.1MB, etc. Adding parameters to the format command only resulted in "parameter not supported" errors. Since this is totally useless, I experimented around until I figured out how to get the drive to format disks properly—you will have to add the following two commands to your `CONFIG.SYS` file:

```
DRIVPARM=/D:1 /F:2
DEVICE=C:\DOS\DRIVER.SYS /D:1 /F:7
```

The first command forces the computer to use disk drive #2 (/d:1 = device #2) as a 720K 3.5-inch disk drive (/f:2). The second command adds a new drive letter for disk drive #2, as a 1.44MB 3.5-inch disk drive (/f:7). On my system, the floptical is drive B: (for 720K disks), and drive E: (for 1.44MB disks). Note that this setting is only required in order to format disks—either setting properly reads and writes to both formats of disks.

When using the PC Transporter, I have had a few random occurrences where a disk will refuse to be formatted, however the disks that I have formatted in this drive have had no problems in being recognized and used on IBM compatible systems (too bad you can't say the same thing about the disks formatted in the Apple 800K 3.5-inch disk drives hooked up to the PC Transporter!).

Balloon v1.0

By Josef W. Wankerl

Where, oh where, have the days of Andy Nicholas gone? Supposedly to the Macintosh Finder engineer team. So who does that leave to carry the torch for all that ShrinkIt related material? Well, I decided it was my turn to carry it for a mile or so. As you may know, there are quite a few programs that will already extract files from ShrinkIt archives: AutoUnShrinkIt, GS-ShrinkIt, NuLib, ShrinkIt, and YankIt, just to name a few. However, one feature that all of these great products lack is the ability to let you extract files right from the Finder. Balloon is a Finder extension which, as you may have already guessed by now, can extract files from ShrinkIt archives right from inside the Finder.

Installing Balloon

To install the Balloon Finder extension, refer to "How to Use Your *GS+* Disk" elsewhere in this issue. Balloon can only be used with System 6.0.1—it will not work with a system prior to 6.0.1.

Unshrinking

Once you have Balloon installed, all you need to do to extract files from a ShrinkIt archive is to simply open the archive. Balloon will recognize that the file you want to open is a ShrinkIt archive, and it will present you with a Standard File dialog which lets you specify the directory where you want to place the files to be extracted from the archive (see Figure 1). Once you choose the destination, Balloon will start to extract the files—and you never even leave the Finder (see Figure 2). I would love to say more on the subject here, but I just can't—it's really that simple.

Preferences

Balloon adds a menu item to the Finder's Extras menu: the Balloon Preferences menu item. When you choose the Balloon Preferences menu item, Balloon will present a preferences dialog letting you change the way Balloon operates (see Figure 3). The first preference item in the dialog is the Applications Get Files First check box. With this check box checked, Balloon will first let the Finder see if there are any applications (such as GS-ShrinkIt) that will unshrink the archive. If there is an application that will handle the archive, the Finder will launch the application and Balloon will not see the file. If the check box is not checked (or if the Finder could not find an application that could handle that particular archive) then Balloon will look at the archive and attempt to process it.

The second preference item in the dialog is the Look In Files (Slower) check box. If the check box isn't checked, Balloon will simply look at the file type and auxiliary type of files that are opened from within the Finder to see if it can handle them. If the check box is checked, Balloon will perform additional tests to the file if the file type and auxiliary type test fails. Balloon will open the file and read any file header information to try to determine if the file is a ShrinkIt archive with a bad file type or auxiliary type. Balloon will find ShrinkIt files that are encased in Binary II and MacBinary wrappers this way, too. With the Look In Files check box checked, all open operations will take a little longer (but the delay is not really noticeable) since Balloon will have to look inside all the files to see if they can be handled.

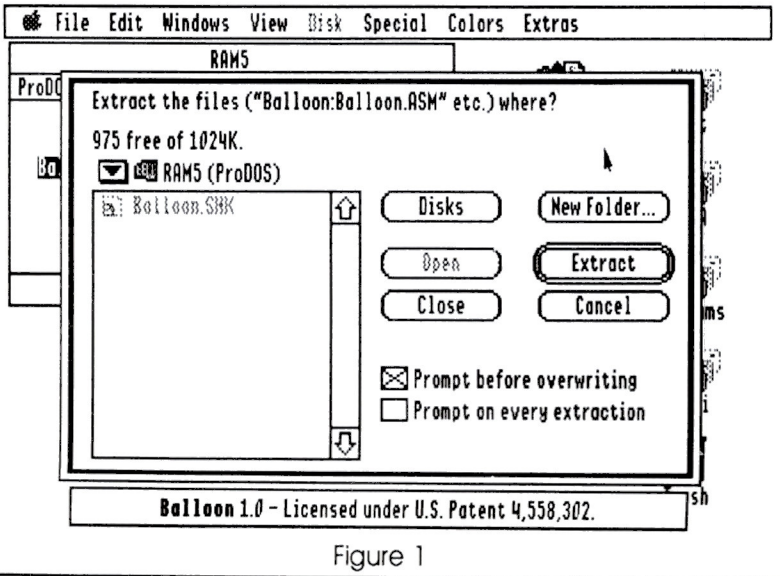


Figure 1

The final preference item in the dialog is the Extract As pop-up menu. The Extract As pop-up menu can be set to one of two values: Hierarchy and Flat File. When the Extract As pop-up menu is set to Hierarchy, all files that are extracted from ShrinkIt archives will be extracted in the exact same folder hierarchy as they were archived. This means that if you archived some files inside a folder, when you extracted the items, they would be extracted in a folder. To be a little bit more explicit, say you had two folders: **November** and **December**. Inside the November folder, you had a single file called **Thanksgiving**. Inside the December folder, you had three files: **Hawaii**, **Birthday**, and **Christmas**. If you archive both the **November** and **December** folders, the files in them also contain the information so that they can be extracted back out to folders named **November** and **December**. With the Extract As pop-up menu set to Hierarchy, Balloon would extract the four files out into the correct folders, creating the folders if they did not already exist. If you haven't guessed already, with the Extract As pop-up menu set to Flat File, Balloon would extract the four files and *ignore* all the folder information. You would end up with the files **Thanksgiving**, **Hawaii**, **Birthday**, and **Christmas** all in the same place. Extracting files without retaining the folder hierarchy can also result in duplicate files names, so you should always be careful when you set Extract As to Flat File.

There are also three buttons at the bottom of the preferences dialog: Cancel, Save, and Accept. The Cancel button will dismiss the preferences dialog and any changes you have made will not take effect. The Accept button will dismiss the preferences dialog and any changes you have made will take effect. The Save button does not dismiss the preferences dialog, instead it takes the current settings you have just set in the preferences dialog and saves them out. It doesn't matter if you hit the Cancel or Accept button next, the preferences have still been saved, and the next time you enter the Finder, the saved preferences will take effect. This provides an easy mechanism for you to make temporary changes to your preferences (just hit Accept and not save them).

Standard File Extraction Dialog

The Standard File extraction dialog (see Figure 1) lets you choose where you want

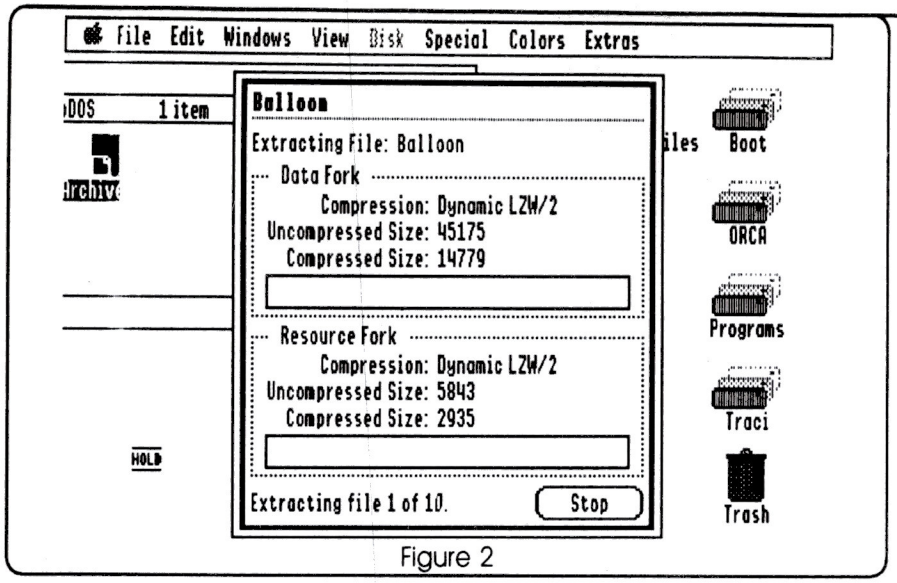


Figure 2

your files to be extracted. There are also two check box options that let you configure Balloon for every extraction. The first check box, Prompt before overwriting, lets you tell Balloon what to do in the case a duplicate file is encountered while extracting. If the Prompt before overwriting check box is checked and a file that is being extracted already exists, Balloon will display a dialog and ask you if the file you are extracting should be skipped or if the file that already exists should be overwritten by the file you are extracting. You can also cancel the entire extraction process. If the Prompt before overwriting check box is not checked, Balloon will always overwrite existing files without bringing up a dialog. Be very careful when you turn the Prompt before overwriting check box off. The second check box, Prompt on every extraction, tells Balloon to present the Standard File dialog for every file in the archive. You can then choose a different destination directory for every file that you extract. You can turn the Prompt on every extraction check box off at any time and Balloon will continue extracting.

Bad Filename Dialog

Since ShrinkIt archives may contain files from various file systems, some filenames may not be appropriate when you extract them to a file system which has a restrictive naming system (e.g. ProDOS). When this happens, Balloon will alert you to the situation by bringing up a dialog telling you that the filename is invalid. You then have the option to skip extracting that file, to cancel the entire extracting process, or to "fix" the filename and continue. When you elect to "fix" the filename, Balloon will take its best guess as to what a similar, yet valid, filename will be for the destination file system and then continue. Note that even though the final filename may be valid for the destination file system, the directory names for the directory hierarchy for the file may be invalid. In this case, you will get the same dialog and Balloon will then "fix" all the invalid parts of the directory if you tell it to.

Other Error Dialogs

There are a couple of other error dialogs which you may encounter when using Balloon. The first will tell you that the master header for the ShrinkIt file is corrupted. What this means is that Balloon thought the file was a valid ShrinkIt archive (its file type and auxiliary type were set to be a ShrinkIt archive) but when the actual contents of the file were examined, the file turned out to not be a ShrinkIt archive. The other, more evil, case is that the file is actually a ShrinkIt archive and the header information is corrupted. The second error dialog you may encounter is one saying that a file in the archive is corrupted. If you encounter this dialog, a valid ShrinkIt archive has been discovered, but a file that is encoded into the archive has an invalid header block or the actual file data has been corrupted in some manner. When you get either of these error dialogs, you can use some of the other extracting programs out there which can handle damaged archives. (AutoUnShrinkIt instantly springs to mind.)

What Else?

That's basically all there is to Balloon. In case you're interested in the inner workings of Balloon, be sure to check out the "Balloon Guts" article elsewhere in this issue. If you find a problem with Balloon, please fill out the problem report form on your *GS+* Disk and send it in. If you cannot extract a ShrinkIt archive with Balloon, send the archive to me so I can see exactly what's going on. And, if you can, keep the problematic archive as small as possible. ***GS+***

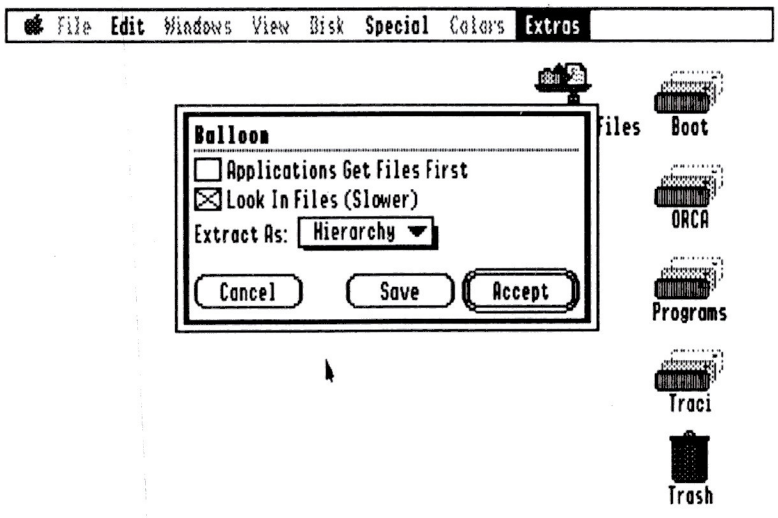


Figure 3

Balloon Guts

By Josef W. Wankerl

Writing a Finder extension is fairly easy, and since I've written a few of them already, I thought that getting a ShrinkIt archive extracting extension wouldn't be all that difficult to do. The actual Finder interface part of it was easy as I expected, however, writing the extraction code was a rather involved process that I hadn't counted on.

The File Type Note

First and foremost, my biggest trouble was reading the file type note describing ShrinkIt archives. (They're actually called NuFX archives, but the terminology is interchangeable, and most people are more familiar with the name ShrinkIt than NuFX.) The ShrinkIt file type note, **FTN.E0.8002**, is in the **GSP.V5.N2.SEA** self-extracting archive on your *GS+* Disk. However, you should definitely read and have a vague understanding of the file type note before you attempt to understand the rest of this article.

There were three major sticking areas in the file type note that provided inaccurate or ambiguous information. (Actually there are quite a few ambiguous areas, but a little tampering with some sample ShrinkIt archives shows what's actually going on.)

The first problem I encountered was that I was computing the CRC for the master header incorrectly. It turns out that there are six additional undefined bytes at the end of the master header that aren't mentioned in the file type note. Once I started calculating the CRC including those six mystery bytes everything started working. The bytes appear to be all zeros on version 2 (the latest version) archives.

The second problem I encountered was computing the CRC for the record header. The file type note states: "The 16-bit CRC of the remaining fields of this block [is calculated from] bytes +006 through the end of the header block and any threads following it." At first, I assumed this to mean that the actual thread data, not just the thread record list. It would have been a rather hideous process to compute the CRC for each thread. Luckily, the statement should have read "... bytes +006 through the end of the header block and the thread records." The threads themselves have their own CRCs stored in the thread records.

The third problem I encountered was with the run length decoding process. (See the "RLE" sidebar for a brief description of run length encoding and decoding.) The file type note says that the RLE sequence is defined by three bytes: the RLE escape code (normally $DB) followed by the number of bytes in the run followed by the byte to repeat. Actually, the RLE escape code is followed by the byte to repeat and then followed by the number of bytes in the run. Also, the number of bytes in the run is one *less* than what should be in the run (i.e. a run value of $06 means that there should be *seven* bytes repeated).

Well I think that's about all of the missing information from the file type note. Now to go on to the actual LZW decompression algorithm! (See the LZW sidebar for a brief description of LZW.)

Unshrinking

After reading the file type note and taking into consideration the above enhancements, you should have a fairly good idea of how to extract files from the archive. The fun part comes when you have to actually uncompress the data. Extracting an uncompressed thread is simple—you just read the data from the thread and write it back out. Extracting a compressed thread is almost as easy.

There are two "types" of LZW compression used by ShrinkIt, called Type I and Type II. The way ShrinkIt compresses data is it reads 4K of data (a chunk) from the source file and compresses it, first with RLE and then secondly with LZW. (There is always 4K worth of compressed data per chunk—if there is not 4K worth of data to read, the remainder of the 4K chunk is zeroed before compressing.) If either RLE or LZW causes the 4K chunk to expand then that method is not used. Using some math you'll quickly see there are four cases for the compression of a 4K chunk: none, RLE only, LZW only, and LZW plus RLE. Since Balloon doesn't do compression, I'm not going to bother with the magic details of compressing. What we're interested in is decompressing, but you have to know a little about how it's compressed to start with.

Once you know how a 4K chunk is compressed, you can pass it through to the correct decompressor. Decompressing a chunk that wasn't compressed is simple: just pass 4K worth of bytes from the current thread right on through to the output file. Decompressing a chunk that was compressed only by RLE is simple as well. The RLE decompressor is a very small piece of code which is easy to follow. The fun part comes with the LZW decompressor. (In the LZW plus RLE case, all you have to do is first decompress the LZW chunk and then pass that result to the RLE decompressor. So now on to the LZW decompressor ....)

LZW

Balloon has four routines that deal with decompressing LZW data: `ReadNextByte`, `TableClear`, `GetCode`, and `UnLZW`. The first routine, `ReadNextByte`, simply retrieves the next byte from the current thread. A 512 byte buffer is maintained for `ReadNextByte` so no GS/OS access is needed until after 512 bytes have been retrieved. This speeds up the decompression process. (Having a larger buffer size would speed up decompression even more, but too large a buffer size would risk reading past the end of the thread, which isn't really bad, but reading unnecessary data is wasted time.)

What Is RLE?

RLE is a method for compressing a repetitive series of bytes. RLE stands for Run Length Encoding. What this means is that a long train of repetitive bytes is replaced by a small code consisting of a run length encoding flag byte, the byte that is repeated, and the number of times to repeat the byte. As an example, the data $FF $AD $AD $AD $AD $AD $AD $F0 $0D can be compressed by RLE due to the redundant $AD bytes. If the RLE flag byte is $DB (as it usually is for ShrinkIt archives) then the data would be compressed into $FF $DB $AD $06 $F0 $0D. However, if the RLE flag byte were $FF then the data would be compressed into $FF $FF $00 $FF $AD $06 $F0 $0D. As you can see, a poorly chosen flag byte can actually result in the expansion of the data instead of compression.

What Is LZW?

LZW is a method for compressing data which has repetitive properties, but does not necessarily consist of repetitive runs of identical bytes. LZW stands for Lempel-Ziv-Welch: the three people responsibile for the creation and evolution of the algorithm. (Most compression books tell a bit of history behind these people and the development of dictionary based compression—I will not.) LZW works by finding generic repetitive strings in the data to be compressed and building them into a "dictionary." This way only an index into the dictionary needs to be known to expand a simple code into a longer string of bytes. Unisys holds a patent (number 4,558,302) on the LZW methodology, and if you want to use LZW in your programs, you *must* contact Unisys and arrange to license the methodology. The person to contact about the patent is:

Mark T. Starr
Unisys Corporation
P.O. Box 500
Township Line & Union Meetings Rds.
Blue Bell, PA 19424
Voice: (215) 986-4411
Fax: (215) 986-5721

The second routine, `TableClear`, simply clears out the current dictionary. (The dictionary is a large database containing common substrings in the compressed file—whenever the compression ratio falls, the dictionary is usually cleared and rebuilt to get better compression performance.) This is done by setting the `next_code` variable to $0101, which is the code for the first dictionary entry. Now the next entry added to the dictionary will be at the start, so that the dictionary is effectively cleared. The LZW decompressor works on the assumption that the dictionary is filled up to the point of the `next_code` variable.

The third routine, `GetCode`, reads in a new code from the thread bit stream. A file compressed with LZW is just a sequence of variable length codes which are interpreted by the LZW decoder. The number of bits that make up a code is directly dependent on the `next_code` variable. The maximum value of the code to be read from the bit stream is the value of the `next_code` variable plus one. (The reason for this is explained later in the `UnLZW` routine.) The number of bits needed to represent the maximum value of the next code is determined from a simple lookup table. The way to determine the number of bits is to look at the high byte of the next maximum code value. A value of $0102 needs only nine bits to be represented (eight for the low byte and one for the high byte). A value of $0232 needs ten bits to be represented (eight for the low byte and two for the high byte). Take some time out and write out the bits in the high byte to see how the high byte value determines the number of bits needed to represent it. (For high byte values $01 to $F, the number of bits necessary to represent the codes are 9, 10, 10, 11, 11, 11, 11, 12, 12, 12, 12, 12, 12, and 12 respectively. Note that the number bumps up one for every new significant bit position used to represent the high byte.)

What may not be overly obvious is the way the code bits are retrieved from the thread bit stream. In all the decompression examples that I have ever seen (I admit that I have not seen all that many, but I have seen a couple), the bits in the bit stream are left shifted out of a generic stream. What this really means is, that if the bits in the stream are 1101011010010101l0, then the two codes produced (assuming nine bit codes) are going to be $01AD and $0056. ShrinkIt, however, takes a different approach, which I, of course, had to learn the hard way. ShrinkIt reads *bytes* from the input stream and then shifts those bits out of each byte to make up a code. Given the same bit stream, the bytes making up the input stream would be $D6 $95 $80 (note that the remaining six bits are set to zero). These bytes in the stream would yield the codes of $01D6 and $002B. (If the above description has you slightly or overly confused, don't feel bad, but it will probably help if you take out a pencil and paper and write out how the bits are divided up, and then shift all of them into codes by hand.)

The last routine, `UnLZW`, performs the real work of decompressing the LZW data. Codes are read from the input stream until the number of expanded bytes matches the count from the chunk header. There are several safety checks throughout the decompressor to make sure that the end of the destination buffer is never written past. (There are similar checks in the RLE decompressor.) A corrupted archive could cause the decompressor to write codes past the end of the buffer.

Before I go any further I think I need to explain exactly what a "code" is. You know already that codes are variable length based on how many bits it takes to hold the maximum value for a code. But what exactly does a code mean? If the code value is in the range of $0000 to $00FF, it means that the code represents a byte that should be written directly to the output buffer (i.e. an uncompressed byte). If the code is $0100, it means that the dictionary table must be cleared. (A $0100 code will never be seen for LZW Type I compression—only LZW Type II compression.) Codes greater than $0100 are dictionary entry codes. When the decompressor sees a dictionary code, it will look into its dictionary and then output the string that it finds for that particular dictionary entry. The more dictionary entry codes there are for a compressed file, the smaller the compressed file will be in relation to its uncompressed counterpart.

The first thing that happens for LZW decompression is the reading of the first code. The first code will *always* be a value between $0000 and $00FF. This is because there are no entries in the dictionary, so a dictionary lookup code would be invalid. The decompressor then remembers the character so it can be added to the dictionary if necessary. (Actually, the code is the first character of the last string added to the output buffer—this will make sense in a few more paragraphs.)

The decompressor then falls into a loop of reading codes and decoding them. If a table clear code ($0100) is found, the dictionary is cleared and the LZW decompression cycle starts again by reading the first code, which will always be between $0000 and $00FF. If the code wasn't a table clear, then it is either an uncompressed data byte or a dictionary code. For an uncompressed data byte, the byte is simply written to the output stream. For a dictionary code, the dictionary is indexed and the string corresponding to the dictionary code is then output. Once the correct output has been determined and written to the output

buffer, a new entry is added to the dictionary.

I have to digress now to discuss how the dictionary is actually implemented. The dictionary is actually a very large table. The table consists of two elements: a byte code to be output and a parent code. To lookup a string in the dictionary, the table is indexed as a huge array. If dictionary code $0121 needs to be decoded, array entry $0020 is accessed. Codes $0000 to $0100 are not kept in the dictionary—the first entry will be $0101, so that is subtracted from the lookup code to save table space. The byte code in the accessed table entry will be the *last* byte in the dictionary string. The parent code is the next dictionary entry to lookup. That will be the second to the last byte in the string. The parent codes are traversed until a terminal code is found: one that is in the range of $0000 to $00FF. Since the last byte is found first, the string must be reversed before it can be placed in the output buffer. Note that a dictionary entry will always be at least two characters long—one character for the initial access and one character for the terminal code.

LZW operates by building a dictionary for bytes that have already been seen. So every time you read a code (except for the initial read), you have to add a new dictionary entry. It keeps the dictionary up-to-date. To add a new entry to the dictionary, you add the first character of the expanded dictionary string as the byte code and the last code you read in as the parent code. An example here might help to clarify things for you. To help explain decompression, I'll borrow an example string to compress from *The Data Compression Book*: " WED WE WEE WEB WET" (note the leading space). The codes output by the compressor were: " ", "W", "E", "D", $0101, "E", $0105, $0106, $0102, "B", $0105, and "T". Here's what would happen during decompression: first the initial code (a space character) would be read. Since it's a terminal code, it is simply output to the target buffer. The next code would be read, "W", and it's a terminal code also, so it gets output to the target buffer. An entry now has to be added to the dictionary. Since the minimum length of a dictionary entry is two characters, the first entry will be " W". The dictionary entry for code $0101 will have "W" as the byte code and " " as the parent code (see Figure 1 for the final dictionary). The next code is read in is "E", a terminal code, so it gets output to the target buffer. The new dictionary entry, $0102, will have "E" as the byte code and "W" as the parent code. The next code read in is "D", yet another terminal code, so it gets output to the target buffer. The new dictionary entry, $0103, will have "D" as the byte code and "E" as the parent code. The next code read in is $0101, a dictionary code. The expanded entry for $0101 is " W", so that is output to the target buffer. To get " W", the decompressor looked at the byte code "W" then at the (terminal) parent code " ". Then the decompressor reversed the codes to be " W". Here's some of the magic now: the new dictionary entry, $0104, will have " " as the byte code and "D" as the parent code. This is because " " is the first character of the expanded string and "D" was the last code read by the decompressor. The next code read in is "E", a terminal code, so it gets output to the target buffer. The new dictionary entry, $0105, will have "E" as the byte code and $0101 as the parent code. The next code read in is $0105, a dictionary code. The expanded entry for $0105 is "WE", so that is output to the target buffer. To get " WE", the decompressor looked at the byte code "E" then at the parent code, $0101. The byte code for $0101 is "W" and its (terminal) parent code is " ". The decompressor reversed the codes it saw to be " WE". The new dictionary entry, $0106, will have " " as the byte code and "E" as the parent code. The next code read in is $0106, a dictionary code. The expanded entry for $0106 is "E ", so that is output to the target buffer. (I won't explain how the code is expanded and reversed anymore—you can do that yourself.) The new dictionary entry, $0107, will have "E" as the byte code and $0105 as the parent code. The next code read in is $0102, a dictionary code. The expanded entry for $0102 is "WE", so that is output to the target buffer. The new dictionary entry, $0108, will have "W" as the byte code and $0106 as the parent code. The next code read in is "B", a terminal code, so it gets output to the target buffer. The new dictionary entry, $0109, will have "B" as the byte code and $0102 as the parent code. The next code read in is $0105, a dictionary code. The expanded entry for $0105 is "WE", so that is output to the target buffer. The new dictionary entry, $010A, will have " " as the byte code and "B" as the parent code. The next code read in is "T", a terminal code, so it gets output to the target buffer. The new dictionary entry, $010B, will have "T" as the byte code and $0105 as the parent code. The target buffer has now been filled so decompression stops. If you were following along with your pencil and paper, you'll now see that your output buffer contains the string we wanted to decompress!

Figure 1 - The Example Decompression Dictionary

Entry	Byte Code	Parent Code	Expanded
$0101	"W"	" "	"W"
$0102	"E"	"W"	"WE"
$0103	"D"	"E"	"ED"
$0104	" "	"D"	"D "
$0105	"E"	$0101	"WE"
$0106	" "	"E"	"E "
$0107	"E"	$0105	"WEE"
$0108	"W"	$0106	"E W"
$0109	"B"	$0102	"WEB"
$010A	" "	"B"	"B "
$010B	"T"	$0105	"WET"

KwKwK

There is one special case you need to know about for decompressing data. This is the case where the code you read is not yet in the dictionary! The reason for this is better explained when you see how LZW actually performs the compression of data, and since I'm not explaining how it does that, you'll just have to take my word for it. This case will only happen when you have a character followed by a string followed by a character followed by a string followed by a character . . . or in the simple example: KwKwK. What you do in this situation is to take the last code read in, decode it, and add its first character to the end of the string. (The last code will expand to KwKw—adding the final K from the front of the string will complete the code.)

What Else?

There's a lot more inside Balloon for you to explore. All you need to do is pick up the source code and browse through it. I've explained here the most difficult (conceptually) parts of extracting files from a ShrinkIt archive. The rest of the routines are fairly simple, although a few may need a close inspection to see exactly what's going on. I hope you now have a newfound respect for ShrinkIt and the programs that work on ShrinkIt archives because I certainly do. ***GS+***

Miscellaneous Library

By Josef W. Wankerl

[Editor's Note: The Miscellaneous Library is not a stand-alone program! It is a programming tool that we think advanced readers of *GS+* Magazine will find very useful. It is intended for those doing advanced IIGS programming. The information provided here is an overview of what's new in the Miscellaneous Library and does not provide complete documentation for all of its calls—if you plan to use the Miscellaneous Library, read the **MiscLib.Docs** file (which is on your *GS+* Disk) for complete information!]

The Miscellaneous Library (MiscLib) is a collection of various routines I have found myself using over and over. They can be used from any language that supports linking to standard libraries, such as ORCA/C and ORCA/Pascal. For detailed assembly language stack diagrams on how to make the calls, and for a short description of the parameters, see the figures in the **MiscLib.Docs** file. (This file is located in the **GSP.V5.N1.SEA** self-extracting archive that is on your *GS+* Disk.)

Pathname

There is one enhancement to the `SplitPathname` routine in the Pathname section. Basically, Diz was writing his CD-ROaM program, and he thought he could use the `SplitPathname` routine, but he didn't read the documentation for the call, of course. He wasn't passing a fully expanded pathname, as the documentation *clearly stated* was necessary for the call to succeed. So Diz complained that the routine "didn't work." Baloney. It worked just fine. He was just using it wrong. Anyhow, since he's the boss, he was right, so I was forced to make a change or two to the `SplitPathname` routine. You can now pass anything you want, whether it's valid or not. Happy now, Diz? For the details on the enhanced `SplitPathname` call, see the **MiscLib.Docs** file.

String

Surprise! There were *three* bugs in the `ConvertString` routine. The first bug would show its ugly head when you tried to convert a zero-length string into a generic text block. (The new empty handle was being allocated with the locked attribute—`NewHandle` complains when you try to create a locked empty handle, so I allocate memory as unlocked, then explicitly lock it.) The other bug appeared when you tried to convert to a C string. There were two problems with converting to a C string: the terminating zero was being placed one character *after* where it should have gone and the memory allocated for the string was one byte *less* than what it should have been. Needless to say, I was very unhappy when I found that both of my bugs were destructive. Cheer up, though, because the new version of `ConvertString` works correctly.

There is also a new routine in the string section: the `StripLeadingSpace` call. The `StripLeadingSpace` routine will take a string, remove any spaces at the start of the string, and then return the resultant string. This comes in very handy when you have used any of the Integer Math xxx2Dec routines and don't want any of the padding.

Miscellaneous

In the vein of the Miscellaneous Library, a new call has been added to the miscellaneous section: the `Big2SmallMercury` call. This call is meant for converting a long mercury value into a word mercury value that the thermometer control can handle. However, you can use this call to convert just about anything from a long value into a proportional word value. For the details on how the `Big2SmallMercury` call works, see the **MiscLib.Docs** file.

For the specifics on how to use any of the Miscellaneous Library routines in your programs, break out the **MiscLib.Docs** file located in the **GSP.V5.N2.SEA** self-extracting archive on your *GS+* Disk.

If you have any questions about the Miscellaneous Library, send them in! I especially want to hear any suggestions you might have for additions to the Miscellaneous Library. Putting all of these routines in one place has already made my IIGS programming easier—I hope it does the same for you. *GS+*

Figure 1
The New Miscellaneous Library Calls

String Calls

`StripLeadingSpace`
Removes any leading spaces from a string

Miscellaneous Calls

`Big2SmallMercury`:
Converts a long mercury value into a word mercury value

Having Problems?

If you are having a problem with your *GS+* Magazine subscription, or one of the programs on the *GS+* Disk, we want to help! But we can't help if we don't know about it!

For subscription problems, or if your *GS+* Disk is *defective*, you can call us at (615) 843-3988, Monday through Friday between 9 a.m. and 6 p.m. Eastern Time.

For problems with one of our programs, *please* fill out the problem form that is on your *GS+* Disk and send it to us.

For *any* of the above, our address is:
GS+ Magazine
P. O. Box 15366
Chattanooga, TN 37415-0366

The GS+ Index: Part 2

By Steven W. Disbrow

Almost since the day we started publishing, we've had requests for an index of the programs and reviews that we've printed. So, to celebrate our fourth anniversary, I decided to try and compile an index of the programs and reviews that we've published. (We'll publish an article index in a future issue.) What I found was that, over these four years, we've published 41 original programs, and reviewed 191 IIGS products! That's quite a lot of ground to cover, so I've decided to split it into two parts, each one covering two of the four years that we've been publishing. Last issue, I covered Volumes 1 and 2, this issue, I'll cover Volumes 3 and 4.

In the program index, you'll find the name of the program, the issue it first appeared in, the issue the *latest* version appears in, and, finally, a brief description of the program. Programs are listed alphabetically for each volume, and not by the issue they appeared in.

In the review index, you'll find a listing of each issue in a volume, followed by the names of all the products that were reviewed in that issue. (I'm not listing page numbers, because they will be irrelevant if and when we get our computerized back issues out.) Reviews are listed alphabetically for each issue. Titles marked with a bullet (•) are shareware or freeware titles.

GS+ Volume 3 Programs

AutoSave
First appeared in *GS+* V3.N2
Current version: v2.0 from *GS+* V4.N6

AutoSave is a new desk accessory which will automatically save the document you are working on after a specified time period. You can also set AutoSave to save your document after a certain number of keystrokes have been typed.

Cool Cursor
First appeared in *GS+* V3.N3
Current version: v2.0.1 from *GS+* V5.N1

Cool Cursor is a control panel which substitutes an animated cursor for the drab static watch cursor. Custom cursor animations can be created with the Anna Matrix application (see the Volume 4 program index for more information on Anna Matrix).

Extra Bits
First appeared in *GS+* V3.N6
Current version: v1.0.1 from *GS+* V4.N6

Extra Bits is a control panel which provides access to some battery RAM parameters introduced in System 6, but for which Apple did not provide a built-in mechanism to access. You can turn on "Smoother mouse cursor" for a flicker-free cursor, you can turn off "Show startup icons" to suppress the display of the icons which march across the bottom of your screen at boot time, and you can set the scale for the WaitUntil toolbox call which affects the timing of system elements such as menu item flashing and scrolling. (Note that access was given to two of the three battery RAM parameters in System 6.0.1, but there is still no way, besides using Extra Bits, to change the WaitUntil scaling.)

FGS - Fractal Graphics & Such
Current version: v1.5 from *GS+* V3.N1

FGS is a fractal generator that allows you to explore the famous Mandlebrot set. FGS uses an advanced rendering technique called "contour crawling" to generate its pictures quickly and accurately while still using the IIGS desktop interface. FGS also allows you to open as many fractal windows as memory will allow, and you can edit the colors of your pictures. If you are a IIGS programmer, the FGS source code is a great example of how to create a full-featured IIGS application.

Joke-A-Rama
Current version: v1.0 from *GS+* V3.N1

Joke-A-Rama is a text-based application which tells jokes. If you have the ORCA Talking Tools installed in your system, Joke-A-Rama will not only show you the jokes on screen, but it will also verbally tell the jokes.

Make
Current version: v2.0 from *GS+* V3.N4

Make is an ORCA/Shell utility which gives you control over building your projects. Make will conditionally compile all the source files which have changed since the last compile time and more! Make can issue any ORCA/Shell command, so you can have Make do routine things such as compiling and linking to the obscure such as installing the finished product and rebooting.

Quick Folder
Current version: v1.0 from *GS+* V3.N6

If you hate opening several folders to get to your next text file and want a quick and easy way to open a folder where you keep your frequently-used files, chances are that Quick Folder is exactly what you're looking for. "Drag the folder out onto the desktop," you say? What a great idea! The System 6 Finder will finally let you do that! But wait . . . the folder is on a file server? The Finder complains loudly when you try to put server items on the desktop. Looks like you're stuck. What's that you say? You could use this neato-keen new Finder extension, Quick Folder, to add folders to your Extras menu? You say it will even remember your icon selections in the folder windows, and optionally, tell the Finder to open your selected icons so that you can go straight to EGOed or to your favorite word processor? What a great idea!

Rebuild Desktop
First appeared in *GS+* V3.N5
Current version: v1.1 from *GS+* V4.N3

Rebuild Desktop is a Finder extension which is available from the Finder's Extras menu. When you choose Rebuild Desktop, the current desktop database is thrown out and rebuild from all the online devices.

Replicator
First appeared in *GS+* V3.N3
Current version: v1.3.1 from *GS+* V4.N2

Replicator is a desktop-based disk copying program. It allows you to load and save disk images for later duplication, and provides the most flexible error checking available in a IIGS disk copying program. Among the options available are the ability to verify the blocks on a target disk, validate the files on a target disk, and you can even compare the contents of the target disk to the original disk image. And, you control how often these checks take place. For example, you can have Replicator verify every fifth disk, validate every seventh disk and compare every 20th disk, all automatically!

Replicator works great with HFS disks (under System 6 and later), and it can even open and duplicate disks saved as Macintosh Disk Copy disk images!

Whoosh
Current version: v1.0 from *GS+* V3.N5

Whoosh is a control panel which lets you turn the new "whooshing" rectangles and their associated sounds for System 6 on and off.

GS+ Volume 4 Programs

Anna Matrix
First appeared in *GS+* V4.N5
Current version: v1.0.1 from *GS+* V5.N1

Anna Matrix allows you to create and modify cursors for use with the Cool Cursor control panel (see the Volume 3 program index for information on Cool Cursor).

Batt Reporter
Current version: v1.0 from *GS+* V4.N3

Batt Reporter will give English descriptions of your battery RAM configuration. In addition, it can compare the contents battery RAM configuration files against one another and your current battery RAM configuration and report any discrepancies.

EGOed lite
First appeared in *GS+* V4.N4
Current version: v1.0.1 from *GS+* V4.N6

EGOed lite is a smaller, stripped down version of EGOed. Where EGOed focuses on powerful editing features, EGOed lite focuses on fast and simple editing functions. (See the Volume 1 program index for a description of EGOed.)

Finder Binder
Current version: v1.0 from *GS+* V4.N6

Finder Binder is a Finder extension which forever ends the days of the annoying "An application can't be found for this document" dialog. Finder Binder knows when the annoying dialog is about to be displayed and displays an alternative dialog instead, which lets you do more than just cancel. You can, instead, connect the document to an application so that the next time you try and open the document, the connected application will be launched instead. The connection is made by adding an icon to an "old-style" icon file. You can then modify the icon file to tailor the icon to your specific needs if you so desire.

Font Memories
Current version: v1.0 from *GS+* V4.N4

Font Memories is a control panel that allows you to keep your bit-mapped fonts on a disk other than your startup disk! In addition, Font memories can load and remove bit-mapped fonts on demand. Together, these two features allow you to save space on your boot disk and save memory by only loading the fonts you need *when* you need them.

Font Reporter
Current version: v1.0 from *GS+* V4.N2

Font Reporter is an application that allows you to generate, save and print reports of your fonts. You can generate reports for both bit-mapped and TrueType fonts, and reports can be saved as Teach files or printed out on your printer.

II Notes
Current version: v1.0 from *GS+* V4.N1

II Notes is a new desk accessory that gives you a 20-page note pad. II Notes automatically saves what you write on each page, and automatically opens back up to the last page you were on. It sounds like a simple utility, and it is, but II Notes is one of the most useful pieces of software you'll use.

LaserBEAM
Current version: v1.0 from *GS+* V4.N4

LaserBEAM is an application which sends PostScript programs to PostScript devices such as Laser printers. You can use LaserBEAM to write your own PostScript programs, or you can send existing programs, such as those created while holding down Command-F when printing using the LaserWriter printer driver.

Miscellaneous Library
First appeared in *GS+* V4.N1
Current version: from *GS+* V4.N5

The Miscellaneous Library is a collection of routines which are useful to anybody doing desktop programming. There are routines to add, delete, retrieve, and sort memRecs for the List Manager, routines to provide undo capability for TextEdit controls, routines to provide a Finder-like About dialog, routines to convert and append strings of all different types, routines to easily retrieve the open/print messages from the message center, and more! Chances are, if you're writing a desktop program, you'll find at least one routine from the Miscellaneous Library that you can't live without.

Open From Desktop
First appeared in *GS+* V4.N1
Current version: v1.0.1 from *GS+* V4.N3

Open From Desktop is a Finder Extension which you access from the Finder's Extras menu. Open From Desktop presents a list of items that are on the desktop and allows you to open them. This is useful, for example, when you have other windows obscuring part of the desktop that contains an icon you wish to open, such as the trash can. Instead of moving windows around to dig your way to the bottom of the desktop, you can simply use Open From Desktop to open the trash can (or any other desktop item).

Rainbow
First appeared in *GS+* V4.N3
Current version: v1.0.1 from *GS+* V4.N4

Rainbow is a Finder extension which remembers the colors for the items on the desktop. In addition to this, Rainbow also colors the title bars of the windows associated with the desktop items to the same color of the desktop item. This provides an easy way to see which window belongs to which desktop device.

GS+ V3.N1 Reviews
Desktop Painter•
Frog Systems 100E (105MB) Hard Drive
HoverBlade
HyperBole
Nite Owl Slide-On Battery
ORCA/Integer BASIC
ORCA/Talking Tools
SoundSmith•
Storybook Weaver: World of Adventure
The Bard's Tale IIGS
TMS Pro 105MB Hard Drive

GS+ V3.N2 Reviews
CosmoCADE•
DataLink II Express
Octo-RAM Memory Board
Star Trek: Classic•
Talking Cloze Technique Greek Mythology
Talking First Words

GS+ V3.N3 Reviews
Astronomer GS•
Calculator NDA•
Chronos II NDA•
Learn to Program in C
MacLand 105MB Hard Drive
Signature GS
SuperConvert
Tulin Half Shell 120MB Hard Drive

GS+ V3.N4 Reviews
ANSITerm
Desktop Enhancer
Explorer! & Gamemaker•
Learn to Program in Pascal
ORCA/M v2.0
Pointless
Secrets of Bharas
Sensei GS•
Shadow Hard Drive
Star Trek: The Next Generation•

GS+ V3.N5 Reviews
Express
Formulate
Pegasus Internal Hard Drive
Second Chance & X2
Shoebox

GS+ V3.N6 Reviews
Gate
Space Fox

UtilityLaunch & UtilityWorks•
Zip GS (10MHz CPU/64K Cache)

GS+ V4.N1 Reviews
ContactsGS
GSymbolix (now Eureka Symbolix)
Kangaroo
ORCA/Debugger
Storybook Weaver: World of Make-Believe
UltraCat

GS+ V4.N2 Reviews
1990 GEM Apple II CD-ROM
AutoArk
Bullseye TrueType Font Collection
Desktop Enhancer
GS System Transport Case
Out Of This World
Pointless
UniverseMaster

GS+ V4.N3 Reviews
AntWars•
CV-RAM Memory Board
FloorTiles•
ProSel-16
Quest for the Hoard•
StyleWriter Printer
TransProg III

GS+ V4.N4 Reviews
DreamGrafix
DuelTris•
Salvation: Deliverance
The Lost Tribe
The Manager
The Passport House Letter

GS+ V4.N5 Reviews
Apple Desktop Bus Mouse II
Baccarat
Key Fonts PRO CD-ROM
MAZER II: The Ghost of Mordaine
Pick 'n' Pile
Shanghai II: Dragon's Eye
Solarian GS•
Twilight II
TypeWest Volume 1

GS+ V4.N6 Reviews
AutoArk
Castle Metacus•
HardPressed
The Lost Treasures of Infocom
Treasures from Heaven: Quest for the Hoard 2
Your Money Matters
Zip Drive

Warranty Disclaimer And Copyrights

EGO SYSTEMS' LICENSOR(S) MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE SOFTWARE. EGO SYSTEMS' LICENSOR(S) DOES NOT WARRANT, GUARANTEE OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE OF THE SOFTWARE IN TERMS OF ITS CORRECTNESS, ACCURACY, RELIABILITY, CURRENTNESS OR OTHERWISE. THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE OF THE SOFTWARE IS ASSUMED BY YOU. THE EXCLUSION OF IMPLIED WARRANTIES IS NOT PERMITTED BY SOME JURISDICTIONS. THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

IN NO EVENT WILL EGO SYSTEMS' LICENSOR(S), AND THEIR DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS (COLLECTIVELY EGO SYSTEMS' LICENSOR) BE LIABLE TO YOU FOR ANY CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, AND THE LIKE) ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE EVEN IF EGO SYSTEMS' LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. EGO Systems' Licensor's liability to you for actual damages from any cause whatsoever, and regardless of the form of the action (whether in contract, tort (including negligence), product liability or otherwise), will be limited to $50.

And *furthermore*,

Some of the programs on this *GS+* Disk contain materials from the ORCA/C and ORCA/Pascal Run-Time Libraries, copyright 1987-1989 by Byte Works, Inc. Used with permission.

The LZW decompression methodology used in Balloon version 1.0 is licensed under U.S. Patent 4,558,302.

All other material is copyright 1993 by EGO Systems, unless otherwise noted. Purchasers of the *GS+* Disk may use the source code and/or libraries in their own programs, provided that the following notice appears somewhere in the program or in its documentation:

"Portions of this program were created using source code and/or libraries from *GS+* Magazine, and are copyright 1989-1993 by EGO Systems. Used with permission. For more information on *GS+* Magazine, write to:

***GS+* Magazine**
P. O. Box 15366
Chattanooga, TN 37415-0366"

Glossary

In each issue of *GS+* Magazine, we present a glossary of some of the more common terms in the IIGS world and some of the more uncommon terms that we use in each issue. If you have a term or bit of jargon that you would like to see explained, let us know and we'll try to get it in a future "Glossary" installment. Also, don't forget about the glossary that's in your IIGS owner's manual! At this point, it contains many more terms than the *GS+* Glossary!

Past installments of the *GS+* Glossary can be found on your *GS+* Disk in the plain ASCII text file, **Glossary**, in the **Documentation** folder. (Entries marked with an "*" have appeared in previous installments of the *GS+* Glossary and are repeated here for our beginning readers or because they have relevance to topics discussed in this issue.)

Apple Desktop Bus (ADB) *

The Apple Desktop Bus is a standardized interface that is used by all Apple computers to communicate with keyboards, mice and other input devices. Because all Apple computers use this standard, you can usually use any ADB input device on the IIGS. However, to make use of these devices, you may need to have an appropriate device driver.

Compact Disk-Read Only Memory (CD-ROM) *

Basically, this is simply a compact disk (physically similar to the ones you buy at a music store), that can contain text, pictures, and sound, instead of just music. Generally speaking, CD-ROMs are not usable in an audio (music) CD player.

A CD-ROM can hold well over 600 megabytes of information, making it ideal for distributing large amounts of information (similar to an encyclopedia).

Double Sided Diskette

A double sided diskette is a diskette that has had both its sides prepared for recording computer data. By using both surfaces, instead of just one, a double sided diskette can hold twice as much information as a single sided diskette. (See "Single Sided Diskette" below.)

Floptical Disk Drive

A floptical disk drive is a device that reads, writes, and formats the following types of disks: double sided/double density (720K capacity only, 800K disks are *not* supported), double sided/high density (1.44MB capacity), and very high density disks (20.2MB capacity). Floptical drives are SCSI drives, which means that they require either an Apple High-Speed SCSI card, or a RamFAST SCSI card to work with the IIGS.

When used with anything other than a very high density (VHD) disk, the floptical drive acts just as if it were a regular disk drive. However, when reading/writing to a VHD diskette, the drive mechanism utilizes special tracks on the diskette to *optically* position the heads, which will then magnetically read/write from/to the diskette. The preciseness of this optical positioning is what enables these diskettes to have such a high capacity. (This unique positioning system is also what gives the floptical drive its name—it is a floppy disk drive that positions its read/write heads optically.)

High Density Disk *

A high density (3.5-inch) disk is a disk that can hold approximately twice as much information as a double density (3.5-inch) diskette. A high-density disk can hold 1.44MB of information. To use a high density disk on the IIGS, you must use an Apple SuperDrive disk drive (or an equivalent drive), attached to an Apple II SuperDrive Controller Card, or a floptical disk drive attached to a SCSI interface card.

ISO *

"ISO" stands for "International Standards Organization." The ISO is a committee that sets international standards for things. For example, in the computer field, there is an ISO standard for implementations of the Pascal programming language.

OOP *

"OOP" is short for "object oriented programming." OOP is a programming method that treats data, procedures, and functions as small parts of a larger whole: the object. Basically speaking, an object is made up of a data structure, along with the procedures and functions that are used to manipulate that data structure.

SCSI Device *

A SCSI device is any device that uses the Small Computer Systems Interface (SCSI) to talk to other devices.

SCSI Terminator *

Like all other computer equipment, SCSI devices communicate with each other using electrical signals. When these signals come to the beginning or the end of the chain of SCSI devices, they need to be stopped, or they can "bounce back" to the other end of the chain and confuse the other SCSI devices. The job of a SCSI Terminator is to stop those signals before they can bounce back. Therefore, both the first and last device in a SCSI chain should have terminators. Devices in the middle of the chain should not have a terminator.

Some devices are internally terminated (that is, the terminator is inside the device case), while others require an external terminator to be attached to one of the devices external SCSI ports. The best way to tell if a device is internally or externally terminated is to check the manual that came with it.

Single Sided Diskette

A single sided diskette is a diskette that has only had one of its two sides prepared for recording computer data. When disk drives first became available for personal computers, single sided disks were the standard. Today however, almost no one uses them.

Small Computer Systems Interface (SCSI) *

Put simply, the Small Computer Systems Interface is a standardized way for computers to communicate with peripherals (hard disks, scanners, etc.) Because it is a standard, a single SCSI device can be used on many different types of computers. For example, most SCSI hard disks can work "out of the box" with both the Macintosh and NeXT computers. With the appropriate SCSI adapter card, the same drive could be used on a IIGS, IIe, Commodore Amiga, or IBM PC clone. The SCSI standard also allows devices to be be daisy-chained together so that you can have more than one SCSI device online at a time.

Very High Density Disk

A 3.5-inch, very high density (VHD) disk is a disk that can hold approximately 14 times as much information as a 3.5-inch high density diskette. A very high density disk can hold 20.2MB of information. To use a very high density diskette on the IIGS, you must use a floptical disk drive attached to a SCSI interface card. (See "Floptical Disk Drive" above.) *GS+*

GS+ Classifieds

Readers can place an ad in the *GS+* Classifieds for only $5. This cost buys 25 words in one issue of *GS+* Magazine. Additional words are just 25 cents each. The *GS+* Classifieds are a great way to contact thousands of other IIGS owners.

The deadline for inclusion of a classified ad in the next issue (Volume 5, Number 3) of *GS+* Magazine is January 7, 1994. Simply send your ad along with your name, address, phone number, number of issues to run, and payment (made payable to "EGO Systems") to *GS+* Classifieds, P. O. Box 15366, Chattanooga, TN 37415-0366; or call us at (615) 843-3988, Monday through Friday between 9 a.m. and 6 p.m. Eastern Time, to place an ad with your MasterCard or VISA. You can also FAX us your classified ad by calling our FAX number: (615) 843-3986.

Bargains! Bargains! Bargains!
GS-RAM Memory Board (256K, ROM 01 only) - $50
256K SIMMS, 150ns (Perfect for OctoRAM & older Macs) - $5 each!
"Magnetic Media! Do not bend or X-Ray!" - 144 labels for $5
1200 baud modem with IIGS cable - $20
Free shipping on labels or if you take more than $10 worth of the other stuff off our hands!
Contact:
GS+ Magazine
P. O. Box 15366
Chattanooga, TN 37415-0366

MusicWriter Fonts
At last, professional output from MusicWriter GS with the MW.Font package!
The MW.Font package includes:
1) A TrueType version of the font, for use with Pointless.
2) A complete set of IIGS bitmap fonts, from 14 to 112 points.
3) A PostScript version of the font, for PostScript printers (you must download the font manually with a utility program).
4) A Macintosh package (PostScript, TrueType and bitmap fonts) for Macintosh network servers.

Price: $85 (by International check, includes shipping and handling).

Contact: P. Pavlides
19 Botsari Str.
Thessaloniki 546 43

Apple IIGS Software
The finest in public domain, freeware and shareware programs for the Apple IIGS. $5/disk. Send $1 for your catalog.

Contact: TCA Software
9936 Forestview Place
Gaithersburg, MD 20879

Nite Owl Products
Slide-On Battery Kit (ROM 1.0) IIGS - $14.95
TADIRAN Battery (ROM 3.0) IIGS - $10
Best of Shareware 10 disk set - $35
Nite Owl Journal or WRAITH Adventure - $10
Include $2 S/H per order ($5 foreign)

Contact:
Nite Owl Productions
5734 Lamar Lane
Mission, KS 66202

Buying Ad Space in GS+ Magazine

Full Page Ads
Each page should be 7 & 1/8 inches wide and 9 & 1/2 inches tall
1 page - $150
2 pages - $250

Partial Page Ads
Partial page ads can be any shape or orientation, but must be no more than 7 & 1/8 inches wide and 9 & 1/2 inches tall
1/3 page (no more than 22.5 square inches) - $60
1/2 page (no more than 33 square inches) - $90
2/3 page (no more than 45 square inches)- $120

If you want your ad to appear on the back cover or inside back cover, add $100. Call for cover reservations.
Spot color is available for an additional $15 per page. Call for details.
Save an additional 20% by placing the same size ad in more than one issue!
Prices good through January 7, 1994.
Request your ad space today to guarantee these low prices!

DEADLINES:
January-February 1994 (Volume 5, Number 3) January 7, 1994
March-April 1993 (Volume 5, Number 4) March 4, 1994
All ads must be camera-ready copy. Payment must accompany ad. Make checks payable to **EGO** Systems, or call us to charge it on your credit card. For more information contact:

GS+ Magazine
P.O. Box 15366
Chattanooga, TN 37415-0366
Voice phone: (615) 843-3988

GS+ Ordering Information

GS+ Magazine is published bimonthly and sold for $3.00 an issue for the magazine only, and $8.00 an issue for the magazine + disk. But, if you sign up for a 1-year subscription (six issues) or a 1/2-year subscription (three issues), you can save 11-25%! To sign up, send this completed form (or a photocopy) along with a check or money order (payable to "**EGO Systems**"), or your credit card number, to:

GS+ Subscription Services
P.O. Box 15366
Chattanooga, TN 37415-0366

Name:..... Phone: (.....).....

Address:.....

City:..... State:..... Zip:.....

Please ✔ item you wish to order:
- ❑ 1-yr subscription (mag + disk) - $36
- ❑ 1/2-yr subscription (mag + disk) - $20
- ❑ 1-yr subscription (mag only) - $15
- ❑ 1/2-yr subscription (mag only) - $8
- ❑ Sample issue (mag + disk) - $8
- ❑ Sample issue (mag only) - $3

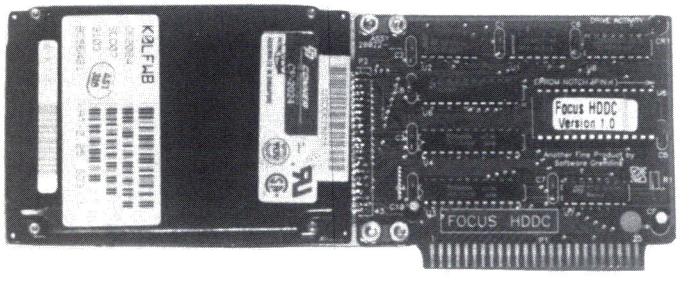
Please ✔ delivery method:
- ❑ Third Class to U.S. - free
- ❑ First Class to U.S., or Canada/Mexico, or Foreign surface - $1.50 per issue
- ❑ Foreign Air Mail - $5 per issue

Please ✔ payment method:
- ❑ Check or Money Order enclosed
- ❑ Bill my MasterCard
- ❑ Bill my VISA

Card #:.....
Expiration Date: ...../.....
Signature:.....

If you prefer to use your credit card to order by phone, give us a call at 1-800-662-3634, Monday through Thursday, between 9 a.m. and 6 p.m. Eastern Time. (9 a.m. till 5 p.m. on Fridays.) All subscriptions will start with the next issue published. *GS+* Magazine is published bi-monthly, so please allow up to 12 weeks for delivery of the first issue of a subscription. Tennessee residents add 7.75% sales tax. *System 6, 4MB of RAM, and a hard disk are recommended for magazine + disk subscriptions.* Please remember to indicate delivery method and include additional charge if indicated.

FOCUS HARD CARD FOR THE APPLE II



FEATURES:
- * Small quiet Internal Hard Card for the Apple IIgs and IIe systems.
- * Complete 2.5" Hard drive with Controller.
- * Hard disk sizes from 20 to 213 Megabytes.
- * Easy to install, just plug in and power up the system, No cabling required.
- * Uses existing internal power supply.
- * Full size Apple II card footprint.
- * Can occupy any slot except slot #3.
- * Up to 2 FOCUS drives per system using the standard Apple II power supply.
- * Drives can interchange between IIgs and IIe without loss of data or configuration changes.
- * Price includes hard card, GS/OS and ProDOS system files, and utility software. Nothing else required.

PRICING:*
- * ***FOCUS 20***, 20 Megabyte Hard Card....$229.00
- * ***FOCUS 40***, 40 Megabyte Hard Card....$329.00
- * ***FOCUS 60***, 60 Megabyte Hard Card....$379.00
- * ***FOCUS 80***, 80 Megabyte Hard Card.....$429.00
- * ***FOCUS 120***, 120 Megabyte Hard Card....$569.00
- * ***FOCUS 160***, 160 Megabyte Hard Card....$664.00
- * ***FOCUS 213***, 213 Megabyte Hard Card....$741.00

TERMS:
- * California residents add 8.25% sales tax.
- * Add $15 for shipping & handling.
- * Add $7 for COD orders.
- * American Express credit card accepted.
- * User group, school and dealer discounts available.
- * 1 Year warranty on controller card and disk drive.

Parsons Engineering
5010 Rimhurst Ave.
Covina, California 91724

***For an extra 10% discount mention GS+ Magazine ***
Sales/Service: (818) 966-5538
Fax: (818) 966-5701

TMS Peripherals

Endorsed by Big Red

TMS Will Meet or Beat ANY Advertised Price!

QUANTUM Hard Drives

SHADOW/PRO STANDARD FEATURES:
Quantum, SyQuest or TEAC mech's. • System 6.0 & 26+ Mbs of shareware • Shadow/Pro Series Manual • 25/50 SCSI cable • Internat'l. auto-switch. power supply • Thermostatic fan (Pro Series) • External SCSI ID • Dual AC jacks (Pro Series) • SCSI-Tee • EXCELLENT Customer & Tech Service 30 Day MBG • 1/2/5 Year Warranties • ESP Extended Warranty Program (Optional)

MECHANISM	*Int.	Pro	Shadow
QUANTUM 170 ELS 2 Yr.	$205	$265	$265
QUANTUM 170 LPS 2 Yr.	215	275	275
QUANTUM 270 LPS 2 Yr.	285	345	345
QUANTUM 340 LPS 2 Yr.	339	399	399
QUANTUM 525 LPS 5 Yr.	615	675	675
QUANTUM 540 LPS 5 Yr.	Call	Call	Call
QUANTUM 540 Emp. 5 Yr.	Call	Call	Call
QUANTUM 700 Pro 5 Yr.	839	899	899
QUANTUM 1050 Pro 5 Yr.	925	985	985
QUANTUM 1080 Emp. 5 Yr.	1025	1085	1085
QUANTUM 1225 Pro 5 Yr.	1099	1159	1159
QUANTUM 1800 Pro 5 Yr.	1449	1509	1509

*Internal prices include complete bracket kit—Mac only!

Shadow Soft-Touch Carrying Case $9.95

TMS PRO REMOVABLES

TMS Pro R45 with 1 cartridge	$369
TMS Pro R88c with 1 cartridge	$535
TMS Pro R105 with 1 cartridge	$589
Extra cartridges R45 $61, R88c $95, R105 $60	

TMS PRO TAPE BACKUP

TMS Pro T155 & 1 tape	$499
Extra tapes $22.50	

Sequential Systems

RamFAST SCSI • DRIVE CONTROLLERS
Twice as fast as any other SCSI card under GS/OS. Five to eight times faster under ProDOS! Supports ALL media and has tape backup software written into the ROM with FULL utility program. **2 YEAR PARTS & SERVICE WARRANTY!**

256K Rev. D V3.0 $169 • 1 Mb Rev. D V3.0 $219

CV-RAM • IIGS MEMORY EXPANSION
CV-Ram comes with 4 Mbs installed, is user expandable to 8 Mbs & is fully DMA compatible to 8 Mbs! Adding memory is as easy as plugging in two chips and moving a jumper for memory intensive applications, like the GS/OS Finder. Need a Ramdisk? Under GS/OS 6.0 using or adding any frills such as fonts or desk accessories can eat up several megabytes in a hurry. Don't buy a non-expandable memory card. The CV-Ram is backed by a **2 Year Parts & Labor Warranty** & **30 Day Unconditional Money Back Guarantee.**

4 Mb $245 • 5 Mb $299 • 6 Mb $355
7 Mb $409 • 8 Mb $465

RAM-GS
4 Mb $129 / $119*
*Bundled with Seven Hills' The Manager

MEG80Z • **1 Mb Aux. slot IIe memory card $49**

bit MOUSE • Serial Apple II Interface	$45
bit MOUSE with Mouse	$65
MegaBuff • 1 Mb IW II Buffer	$110
Q-Buff • 32K ImageWriter Buffer	$25
Q-Print • Apple II Printer Interface	$29
Q-Print II • Apple II GPI	$39
Q-System GS+ • 7 Serial Inputs	$399
Q-System GSe • 5 Input, 1 Output	$355
Q-System Parallel/Serial	$189/$249
Q-Talk LTO • LocalTalk Card	$69
Ram 80 • 64K/80 Column Card	$15
SuperCOMM/SuperCOMM Ic	$55/$45

Bundle InTREC's ProTERM 3.0 with modem & take $5 Off!

Supra Corporation

Fax Modem V.32 bis $239

T E C H N O L O G Y

8 MHz/16K Cache	$179/$169*
8 MHz/64K Cache	$239/$229*
9 MHz/32K Cache	$239/$229*
9 MHz/64K Cache	$299/$289*

*This price good with the purchase of any Closeout item. 1 Year Full Warranty on ALL ZIP Technology Products

IIGS Products From Seven Hills Software

IIGS MultiFinder

The MANAGER $39
The 1st & only TRUE MULTIFINDER for the IIGS! Multiple applications can be opened simultaneously. You DO NOT have to quit one application to start using another as long as you have sufficient RAM available! Fully compatible with AppleWorks GS, GraphicWriter III, Platinum Paint, Teach and a whole lot more! Not merely a program "switcher," but a TRUE MultiFinder environment for your Apple IIGS!

GRAPHICWRITER III™	$89
SHOEBOX™	$35
EXPRESS™	$29
KANGAROO™	$29
TRANSPROG III™	$25
DRIVE CLEANER™	$25

II PRODUCTIVE
340 TrueType™ Fonts. Includes HyperCard IIGS with Reference Stack, Shrinkit GS & FREE AOL Software & log time. Includes fonts such as Ambrosia Hollow, Arenski, Foxtrot, Future, Groening (Simpson's font!), Jester, ShockFont, Steelplate, Stucco, Varsity, Western, Windsor, Zingnats and hundreds more!!! **ONLY $45!!!**

True Type Font Collection
POINTLESS BUNDLE $85

4Mb $119* Ram-GS 2 Year Warranty

CLOSEOUT

APPLIED ENGINEERING	
DL Express V.42 & S-Fax	$279
ReadyExpress Package	$229
GS Ram III 0 Mb	$79
BEAGLE BROTHERS	
TimeOut SpreadTools	$32
TimeOut MacroEase	$21
BRØDERBUND	
McGee at the Fun Fair Macintosh	$21
The Playroom Macintosh	$27
Katie's Farm Macintosh	$21
McGee Macintosh	$21
BeagleWorks Macintosh	$149
DREAMWORLD SOFTWARE	
DreamGrafix	$58
INTREC	
ProTERM	$69
ROGER WAGNER	
Macromate	$25
VITESSE	
Deliverance/Renaissance	$42
Harmonie	$35
WESTCODE	
Inwords	$59
Pointless	$39
Hardpressed	$39
TypeWest™/Pointless Bundle	$55

"TMS Peripherals'...combination of better-than-average speed, design and construction quality, packaging, and support is a sum greater than its parts."
—MacUSER April 1992

Sales: 9 a.m.–8 p.m. M–F; 10 a.m.–4 p.m. Sat. (ET) Tech. Support & Customer Service 10 a.m.–6 p.m. M–F (ET)

International 407.998.9928 • FAX: 407.998.9983 Compuserve: 75300,2231 • America On Line: TMS Periph

800-ASK-4TMS
800-275-4867

FEDERAL EXPRESS · VISA · MasterCard · DISCOVER

1120 Holland Drive, Suite 16 • Boca Raton, Florida 33487

PAYMENT: Visa, Mastercard, Discover, Certified Checks, PO's and COD's accepted. **TAX:** Florida residents add 6% sales tax. **PRICES:** Subject to change and availability. **SHIPPING:** Minimum $5-UPS Ground, Blue, Red & Federal Express Economy. **RETURNS:** Products must be in original condition and require an RMA#. Seal must not be opened on software packages. Some items may be subject to a restocking fee. Please inquire when ordering. TMS will not be held liable for errors in typing or photography. All Trademarks and Service Marks belong to their respective owners.

Reference: GSND93

GS+ Magazine
P.O. Box 15366
Chattanooga, TN 37415-0366

Forwarding & Return Postage Guaranteed

Downloaded from www.Apple2Online.com

BULK RATE
U.S. POSTAGE
PAID
Chattanooga, TN
PERMIT NO. 616