

BalloonTM

By Josef W. Wankerl
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Contents

1. Introduction to Balloon.....	5
What Are NuFX & ShrinkIt Archives?.....	5
About This Manual.....	7
System Requirements.....	7
Please Tell Us What You Think!	7
2. Installing Balloon	8
Preparing to Install Balloon.....	8
Preparing to Install the Balloon XCMD.....	8
Installing.....	8
For Those Who Hate Installers.....	9
3. Balloon Basics	10
Creating a New Archive	10
Opening an Existing Archive	12
Setting Balloon Preferences	13
Balloon Limitations.....	16
4. Working With the Archive List Window	17
Extracting Files From an Archive	18
Getting Information on Archived Files	21
Sorting Files in an Archive.....	22
Deleting Files From an Archive	22
Adding Files to an Archive	22
Selecting All the Files in an Archive.....	23
5. The Balloon Finder Interface.....	24
Opening Archives.....	24
Extras.....	24
6. Using the Balloon XCMD For Spectrum	26
Balloon XCMD Preferences.....	26

7. Scripting With the Balloon XCMD For Spectrum	29
EXTERNAL Balloon	29
0	29
Queued	29
Queue	30
Expand.....	30
Flush.....	30
Prefs Get.....	30
Prefs Set.....	30
Create	31
Open	31
Add.....	31
Close.....	32
Additional Scripting Notes.....	32
8. Examples	33
Extracting With Balloon.....	33
Creating an Archive With Balloon.....	34
Extracting From Inside the Finder.....	34
Creating an Archive From Inside the Finder.....	35
Extracting and Using Extensions to Open.....	35
Downloading and the Balloon XCMD.....	36
Appendix 1 - Differences From Balloon v1.0.....	37
Appendix 2 - Different Filename Suffixes	38
Appendix 3 - LZW Compression	40

1. Introduction to Balloon

There are many archive formats for many different computers. However, for each computer platform there is usually one archive format that is used more than any other. On the Apple II, the ShrinkIt (NuFX) archive format is the most common. Balloon is a new desk accessory which will let you easily work with ShrinkIt archives. You can use Balloon to extract files from an archive, add files to an archive, or create an entirely new archive. Many other programs exist which let you perform similar actions (the freeware program, GS-ShrinkIt, is perhaps the most widely known); however, those other programs are separate applications. Since Balloon is a new desk accessory, it will let you work with archives from within *any* desktop-based application that properly supports new desk accessories. Being able to work with archives without quitting your current application and running another program can save you *lots* of time and headaches.

Balloon will recognize many forms of ShrinkIt archives (normal archives, self-extracting archives, and archives enclosed in special “wrappers” such as Binary II). Balloon will *not* recognize archives that are not ShrinkIt archives (e.g. StuffIt, ZOO, or ARC archives are not recognized by Balloon). However, since the ShrinkIt archive format is the most commonly used on the Apple II, Balloon should be able to handle about 95% of the archives that you come across while using your IIGS.

The Balloon package also includes the Balloon XCMD for Spectrum v2.0. With this XCMD installed, Balloon can work with version 2.0 of the Spectrum telecommunications program to automate the process of extracting files from the ShrinkIt archives that you download. You can also use the Balloon XCMD for Spectrum to create Spectrum scripts that can automate other Balloon operations, such as creating archives and adding files to them. For more information on these features, see chapter 6 and chapter 8.

What Are NuFX & ShrinkIt Archives?

ShrinkIt and GS-ShrinkIt are two of the many programs which create and manipulate NuFX archives. Since ShrinkIt was the first program to work with NuFX archives, the archives are now commonly referred to as ShrinkIt archives. (Throughout this documentation NuFX archives will be called ShrinkIt archives since it is the more common terminology. By the way, NuFX is pronounced “new effects,” although some people incorrectly pronounce it “new fix.”)

An archive (ShrinkIt or otherwise) is a file which contains one or more files. In this respect, an archive acts like a folder by letting you group related files together in one place. Unlike a folder, you have to use a special program (like Balloon) to retrieve files from an archive. (The act of getting a file out of an archive is called "extracting" the file.) The reasons why you may want to create an archive are many and various; however the most common reason to create an archive is to prepare a group of files to be uploaded or sent (via modem or other means), to a BBS, online service, or maybe even your best friend across town. It's much easier to send one file than many separate files. By using an archive to send files, you gain the following benefits:

- **Error detection** — ShrinkIt archives keep checksums (actually "16 bit cyclic redundancy checks" if you really wanted to know the technical name) on all the files in the archive. If a part of the archive becomes damaged in some fashion (i.e. line noise in a file transfer or a bad disk block somewhere) then extracting programs can detect the error and alert you.
- **File type preservation** — When sending a file over a modem, certain file attributes (such as the file's name, size, and type) may not be transmitted. ShrinkIt archives retain all information about the archived files, so when you extract a file from the archive, it will be an exact duplicate of the original file in every respect.
- **Compression** — Since files may be compressed inside an archive, the size of the file you end up transmitting becomes much smaller. Since smaller files are sent faster, you can send more files in less time, which may save you some money.

Speaking of compression, archives are usually created for the sole reason of compression. Of all the reasons to archive files, compression is the only one which cannot be accomplished by any other means. (e.g. preserving the filename, type, and size can be accomplished by using a Binary II wrapper and error detection can be accomplished by using an error checking transfer protocol.) ShrinkIt, and hence Balloon, use a form of LZW compression. The LZW compression method builds a dictionary of common phrases seen in the file and saves out indexes into the dictionary instead of common phrases to decrease the size of the file. (See Appendix 3 for more on LZW compression.)

Another neat feature that ShrinkIt archives have is the ability to attach comments to archived files. After a file is in an archive, you can attach a

comment to it. Lots of people use the comments to describe the contents of the file in the archive. You can then use the comments to determine whether or not you need to extract a file from the archive.

About This Manual

This manual is intended to do two things:

- Describe what Balloon can and can not do.
- Give you concrete examples of how to use Balloon.

Chapters 1 through 7 of the manual will describe in detail what Balloon can do, and chapter 8 will give you examples of how you actually do these things.

Throughout this manual, screen shots are shown for the important windows and dialogs that you will see when you use Balloon. Since Balloon works in both 640 and 320 modes, the dialogs may appear slightly different for each mode. All the screen shots in this manual are for the 640 mode unless otherwise noted. (The content of the dialogs will be the same for both 640 and 320 mode, it may just be arranged differently to accomodate the smaller screen width in 320 mode.)

System Requirements

Balloon only works with Apple IIGS System Software version 6.0.1 or later. It will not work with any System Software prior to v6.0.1. We also recommend that you have at least 2MB of RAM (the more RAM you have, the better) to make good use of System Software v6.0.1 and Balloon. Balloon takes up approximately 120K of disk space on your startup disk, so a hard drive is also required.

Please Tell us What You Think!

Before you read any further, please take a few moments to fill in your name, address and Balloon serial number on the product registration card that came with Balloon. (Your Balloon serial number can be found on the Balloon disk label.) After you've done this, read the rest of this manual, install Balloon, and then take some time to work through the examples in Chapter 8. When you finish the examples, jot down any comments you have about Balloon on the registration card, and then send it in to us so that we can know what you think about Balloon!

2. Installing Balloon

To correctly install the Balloon new desk accessory and the Balloon XCMD for Spectrum v2.0, you should use the Installer program on your Balloon disk. The Balloon Installer program requires System 6.0.1, just as Balloon and the Balloon XCMD do, so be sure you are using the correct system before you launch the Installer. Launch the Installer and then use the following instructions to tell the Installer where you want Balloon installed.

Preparing to Install Balloon

If you want to install the Balloon XCMD, but not the Balloon new desk accessory, make sure the “Install the Balloon™ new desk accessory” check box is not checked. To install the Balloon new desk accessory (with or without installing the Balloon XCMD), make sure the “Install the Balloon™ new desk accessory” check box *is* checked. The Balloon new desk accessory must be installed on a System 6.0.1 startup disk. Click on the Disk button until the startup disk you want to install Balloon on is shown after the Install on volume prompt.

Preparing to Install the Balloon XCMD

If you want to install the Balloon new desk accessory, but not the Balloon XCMD, make sure the “Install the Balloon™ XCMD for Spectrum v2.0” check box is not checked. To install the Balloon XCMD (with or without installing the Balloon new desk accessory), make sure the “Install the Balloon™ XCMD for Spectrum v2.0” check box *is* checked. A Standard File dialog will then appear asking you to locate the Spectrum application. If you choose the wrong application, you can click on the Locate button to change path to the Spectrum application.

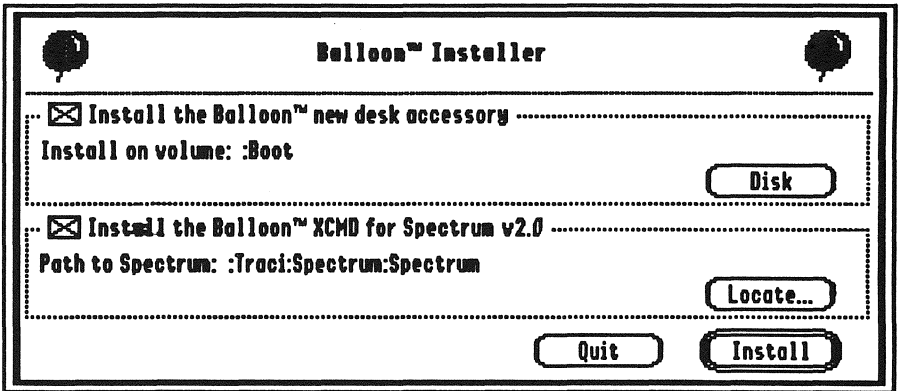
Installing

Once you have the correct disk for the Balloon new desk accessory and/or the correct path to the Spectrum application set, you can click on the Install button to start the installation process. A progress window will appear showing which files are being copied. When the Installer finishes copying all of the necessary files, the progress window will disappear and you can either quit the Installer or restart your computer. Note that if you installed the Balloon new desk accessory on your startup disk, your only option will be to restart your computer. (This is because you must restart for Balloon to become active.) Otherwise, you can quit back to the program that you ran the Installer from.

For Those Who Hate Installers...

For those of you who hate installer programs, you can install Balloon yourself. All you have to do is copy the Balloon new desk accessory file to your `*:System:Desk.Accs` folder. If you have Balloon v1.0, you must delete the Balloon file from your `*:System:FinderExtras` folder before you copy over this version of Balloon. (The Installer will do this for you automatically. See Appendix 1 for more information on the differences between Balloon v1.0 and this version) The Installer program will also move any Balloon v1.0 preference file from the folder the Finder is in to the Desk.Accs folder, so if you want to retain your old preferences, you should move that file as well.

To install the Balloon XCMD, just copy the Balloon XCMD file to the `Add.Ons:XCMDs` folder located in the same folder that the Spectrum application resides in.



The Balloon Installer

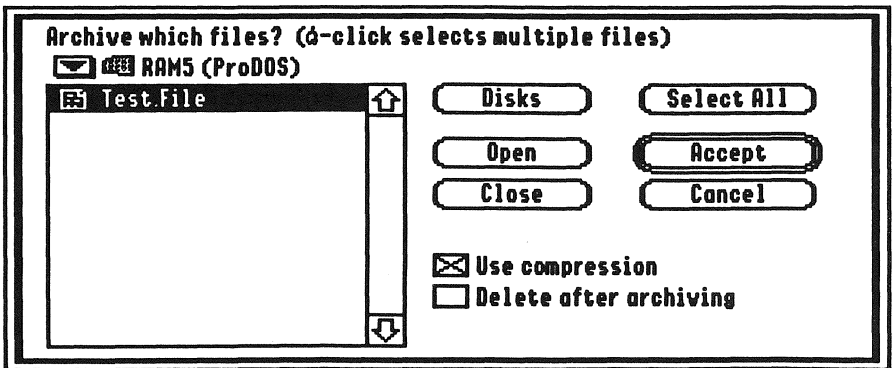
3. Balloon Basics

Balloon is a new desk accessory. (If you have Balloon v1.0, see Appendix 1 for a list of important changes in Balloon that you need to know about.) You can use Balloon by selecting the Balloon menu item from the Apple menu of any correctly written desktop application which supports desk accessories. When you choose the Balloon menu item, the Balloon desk accessory window opens and appears on your desktop (see screen shot at right). You use the Balloon desk accessory window to tell Balloon to create a new archive, open an existing archive, or to set the Balloon preferences.



Creating a New Archive

To create a new ShrinkIt archive, open the Balloon desk accessory window and click on the area labeled "New Archive..." or press the "N" key. A Standard File dialog will appear (see screen shot below) allowing you to select the files you wish to archive. To select a file to archive, you click on it in the list of files. To select a contiguous range of files, you click on the first file in the range then hold down the shift key and click on the last file in the range. To select (and deselect) files in any order, hold down the Command key (also known as the "Open-Apple" key) and click on a file to toggle its selection state.



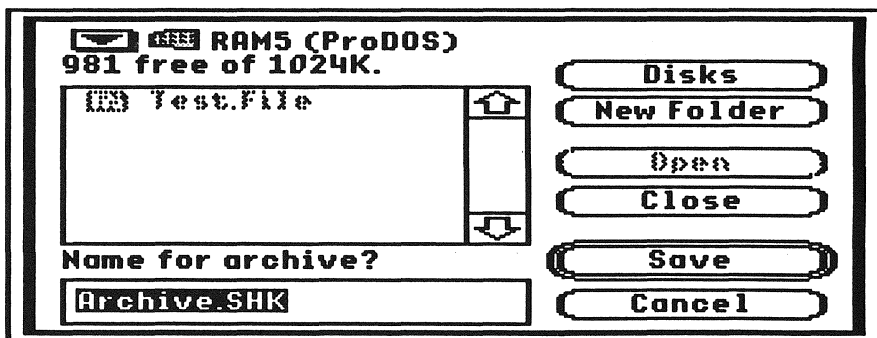
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The Standard File dialog will only let you select files in one folder at a time. If you need to archive files from many different folders, start by archiving all the files you need from one folder. Once you've created the

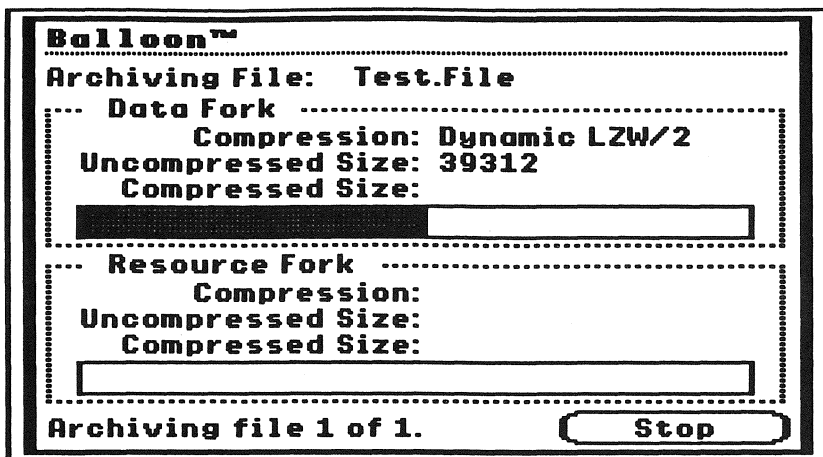
archive, you can open it and add new files to it using the Add Files option described in the “Adding Files to an Archive” section in Chapter 4.

There are two check boxes in the Standard File dialog which let you control what happens during the archive operation.

- If the “Use compression” check box is checked, Balloon will attempt to compress each file as it is placed in the archive. (Some files may not compress simply because there isn’t enough redundant information in the files for compression to take place, so they will be placed in the archive without any compression being used.) If the check box is not checked, Balloon will simply place the files in the archive without using compression. Not using compression will greatly speed up adding files to and extracting files from archives. But, since one of the main reasons to archive files is to use compression, you’ll probably never turn this check box off, however, it’s there “just in case.”
- If the “Delete after archiving” check box is checked, Balloon will archive all your selected files, and after each file is placed in the archive it will be deleted. The deletion process is automatic and you will receive no warnings that files are being deleted! Normally you shouldn’t have a use for this feature and should leave the check box unchecked. The reasoning behind this option is that in some cases, after the file is in an archive, you won’t need the original file anymore.



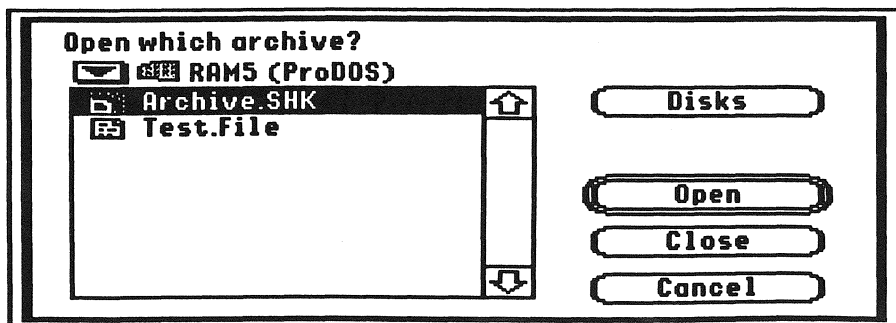
After you’ve selected all the files you wish to archive and have set up the correct archiving options, click on the Accept button to confirm your desire to archive the files. A second Standard File dialog will appear to let you give your new archive a name (see screen shot above). When you click on the Save button, Balloon will then take over and start archiving the selected files.



During the archiving process, a dialog is shown which informs you of the archiving progress (see screen shot above). You can click on the Stop button (or press Command-period, or press the escape key) at any time to force Balloon to stop archiving the files.

Opening an Existing Archive

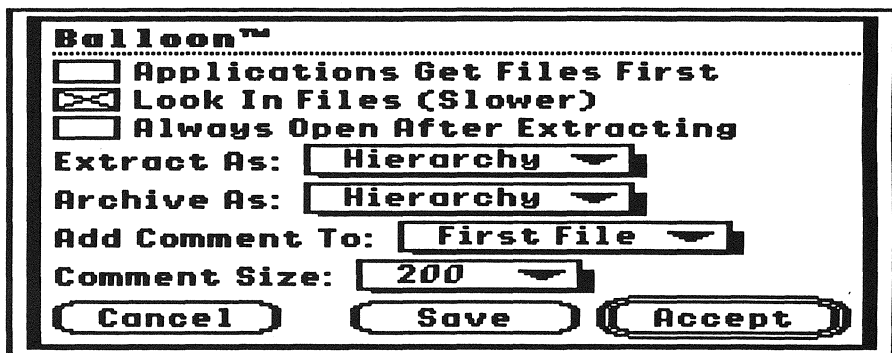
To open an existing ShrinkIt archive, open the Balloon desk accessory window and click on the area labeled "Open Archive..." or press the "O" key. A Standard File dialog will appear (see screen shot below) allowing you to select the archive you wish to open. Note that *all* files are shown in the file list, not just files with the NuFX archive file type. The reason for this is that you may have downloaded a ShrinkIt archive and its file type may not have been preserved during the download. If you attempt to open a file that is not a ShrinkIt archive, Balloon will simply alert you that the file is not an archive and then you can try again. If you choose a valid ShrinkIt archive to open, Balloon will open the archive and present you with an archive list window. For more information on working with an



archive list window, see chapter 4. (Note that, unlike GS-ShrinkIt, you can have as many archives open as memory allows.)

Setting Balloon Preferences

To change some of Balloon's operational settings, open the Balloon desk accessory and click on the area labeled "Preferences..." or simply press the "P" key. A dialog will then appear showing you the current Balloon preference settings (see the screen shot below). If all you wanted to do was look at the preferences, or if you changed some preferences but don't want them to take effect, just click on the Cancel button and the dialog will disappear. If you changed some settings and want the adjustments to take effect immediately, click on the Accept button to dismiss the preferences dialog. If you want the settings to be used every time, click on the Save button. The Save button does not dismiss the preference dialog, instead it takes the current settings you have just set in the preferences dialog and saves them to the Balloon preferences file. It doesn't matter if you click on the Cancel or Accept button next, the preferences have still been saved, and the next time you restart, Balloon reads the preference settings from its preferences file. This provides an easy mechanism for you to make temporary changes to your preferences (just hit Accept and don't save them).



- The "Applications Get Files First" check box controls what happens when you try to open an archive in the Finder. (For a discussion of the Finder interface, see chapter 5.) With this check box checked, Balloon will first let the Finder see if there are any applications (such as GS-ShrinkIt) that can handle the archive. If there is an application that will handle the archive, the Finder will launch the application and Balloon will not do anything with 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 open it.

- The “Look In Files (Slower)” check box also controls what happens when Balloon attempts to open a file in the Finder. If the check box is not 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 on 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 file wrappers such as the Binary II, MacBinary, and America Online for Macintosh wrappers. Self-extracting archives can only be recognized with this check box checked. With this check box checked, all open operations in the Finder will take a little longer (but the delay is not too noticeable) since Balloon will look inside all the files you try to open to see if they are ShrinkIt archives that it can open.

- The “Always Open After Extracting” check box relates to the “Open after extraction” check box in the Standard File dialog which lets you choose where to extract files. With this preference checked, the default value for the “Open after extraction” check box will be to have Balloon tell any system extensions to open the files after they have been extracted. If you routinely want to ask system extensions to open files you extract, turning this preference on can save you a bit of time since you won’t have to check the “Open after extraction” check box in the Standard File dialog every time you extract files. (For more on how this preference affects the operation of Balloon, see the section “Extracting Files From an Archive” in Chapter 4.)

- The “Extract As” preference is a pop-up menu that tells Balloon what to do when extracting hierarchical entries. (“Hierarchical entries” are simply files that were archived inside a folder.) This pop-up menu can be set to one of two values: “Hierarchy” or “Flat File.” When it 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.Trip, My.Birthday, and Christmas. If you archive both the November and December folders, the archive will contain the information needed to extract these files back out to folders named November and December. With this preference 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 this preference 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.Trip**, **My.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 this preference to “Flat File.”

- The preference “Archive As” is another pop-up menu that tells Balloon what to do when adding hierarchical entries to an archive. This preference can be set to one of two values: “Hierarchy” or “Flat File.” When it is set to “Hierarchy,” all files that are archived will contain information so they can be extracted in the exact same folder hierarchy as they were archived. With this preference set to “Flat File,” no folder information is retained when files are archived. When you extract files from an archive created with the “Flat File” option, since no folder information is retained, it has the same effect as extracting with the “Flat File” option. Extracting files without retaining the folder hierarchy can result in duplicate files names, so you should always be careful when you set this preference to “Flat File.”

- The “Add Comment To” preference is a pop-up menu that tells Balloon how to attach comments when adding files to an archive. This can be set to one of three values: “First File,” “All Files,” or “No Files.” When set to “First File,” a comment record is attached to the very first file added to an archive. When set to “All Files,” a comment record is attached to every file added to an archive. When set to “No Files,” no comment records are attached to any of the files added to an archive. (Note that comments can *only* be given to file entries which have comment records attached to them when the file is archived. In other words, if you archive a file without a comment record, you can’t go back and add one later.)

- The “Comment Size” preference is a pop-up menu which controls how much space is reserved for comment records. The comment size can be set to 100, 200, 400, 800, or 1,000 characters. (Note that even if you don’t explicitly use the comment record attached to a file entry, or if you use less than the the number of characters defined for the comment record, the space is still used in the archive. You should choose a comment size that accurately reflects the size of the comment text you commonly use, as any unused comment space takes up room in the archive.)

(By the way, if you ever want to find out what version of Balloon you have, bring up the Balloon preferences dialog and click on the word “Balloon” at the top of the dialog.)

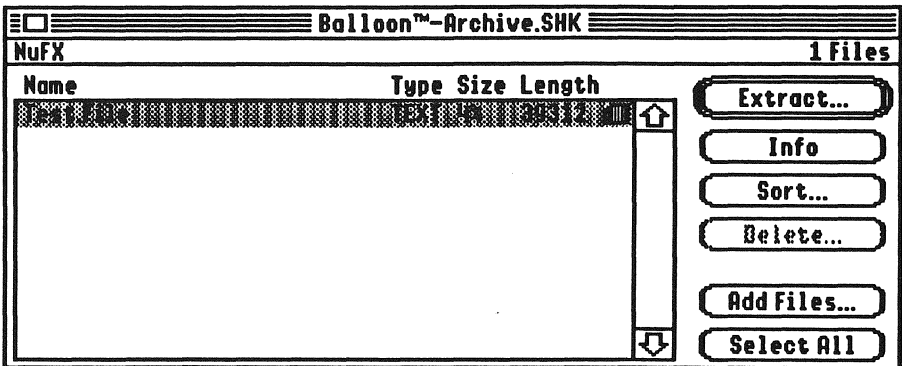
Balloon Limitations

Balloon was created as a new desk accessory to give IIGS users a quick and easy way to work with ShrinkIt archives. This sounds like a great idea (We certainly think it is!), but since a new desk accessory hangs around in memory all the time, Balloon includes only the most commonly used features of an archive program. This means, of course, that some of the more uncommon (and less useful) features that you might find in a stand-alone program are missing from Balloon.

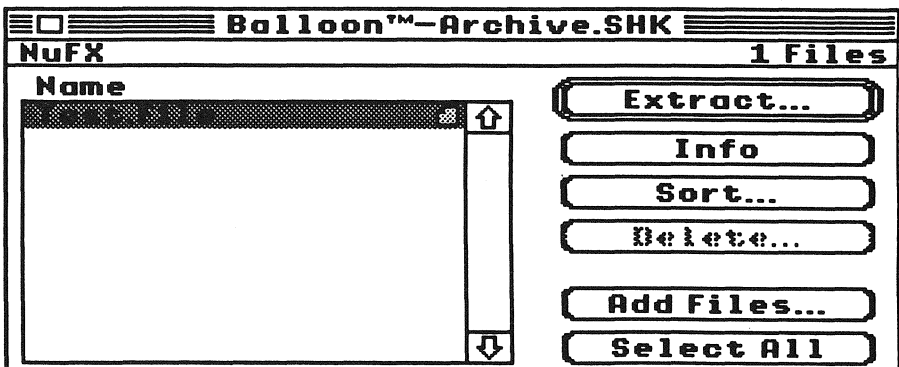
- First and foremost, Balloon doesn't handle disk archives. If you need to create disk-image archives, or if you need to extract disk images from archives, you should use GS-ShrinkIt. Fortunately disk archives are fairly rare. The main reason is that archiving a complete disk image is usually wasteful since you archive blocks of the disk which aren't in use and you can't selectively extract files that are inside the disk archive. Archiving files is a much better alternative. If you try to extract a disk image from an archive using Balloon, an alert window will be shown telling you that extracting disk images is not supported.
- Balloon only supports sorting files in an archive by ascending filename order. If you need more extensive sorting options, you should use GS-ShrinkIt.
- Balloon will not create self-extracting archives. If you need to create a self-extracting archive, you should use GS-ShrinkIt.
- Balloon will not create ShrinkIt archives encased in Binary II wrappers (.BXY files — see Appendix 2 for more on this type of file). It is the responsibility of the telecommunications program, not Balloon, to attach a Binary II wrapper to a file. So, if your telecommunications program is written correctly, you won't ever miss this feature. But, if you really need a ShrinkIt archive with a Binary II wrapper, you can use GS-ShrinkIt to create one.
- Balloon works *only* with ShrinkIt archives. Other archive programs, such as GS-ShrinkIt, can open other archive formats as well such as StuffIt, Unix Compress, and ZOO. If you need to work with another archive formats, then you need to use a program other than Balloon. (For more on the various archive formats you might encounter, see Appendix 2.)

4. Working With the Archive List Window

Once you've opened a ShrinkIt archive, Balloon creates an archive list window. The two screen shots below show what the archive list window looks like in 640 and 320 modes respectively. The main difference in the two displays is in the amount of information presented in the file list. There simply isn't enough screen real estate in 320 mode to present all of the statistical and file type information that is presented in 640 mode.



The archive list window is composed of three parts. The first is the window information bar which displays some general information about the archive. The information bar displays what kind of archive has been opened and the total number of files contained in the archive. The kind of archive will either be NuFX or Self-Extracting. A NuFX archive is a simple ShrinkIt archive. A Self-Extracting archive is a GS/OS application which contains a NuFX archive, and when launched will



extract the files from the archive. Both the NuFX and Self-Extracting kinds of archives may be Encapsulated, which means that some kind of header (e.g. a Binary II wrapper) is also attached to the archive.

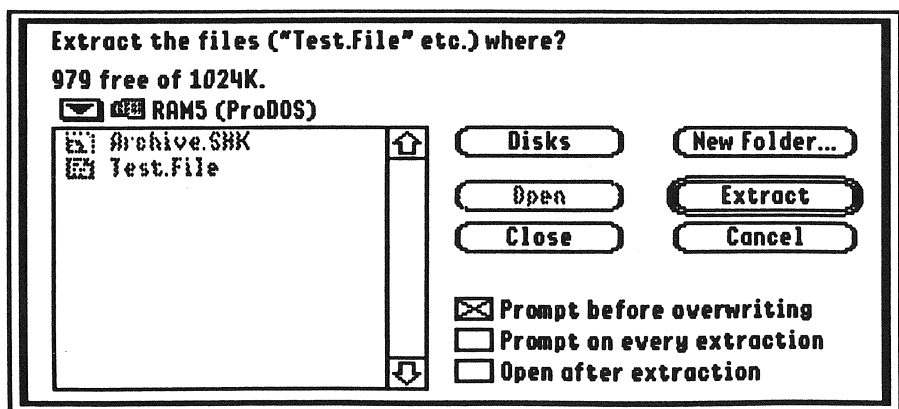
The second part of the archive list window is the file list area. The file list shows the names of all the files contained in the archives. In 640 mode, the file list will also show the generic file type for the file, how much the file was compressed in the archive, and the uncompressed size of the file. If a comment record is available for the file, a small document icon will be shown at the right hand side of the file entry. If the comment record has text in it, the icon will be yellow. If no text is in the comment record, the icon will be gray. (You can hold down the shift key and click on an item to contiguously select multiple items in the list, or you can also hold down the Command key and click on any item to toggle its selection state.)

The third part of the archive list window is the button area. The buttons allow you to tell Balloon to perform actions relating to the archive. The function for each button is described in the following sections.

Extracting Files From an Archive

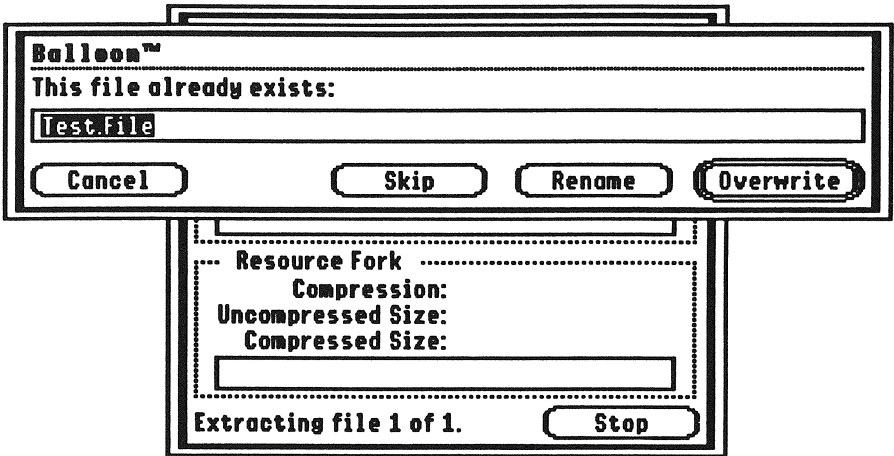
To extract files from an archive, you select the files you want to extract in the file list and then click on the Extract button or press the return key. A Standard File dialog then appears which lets you choose where you want your files to be extracted (see the screen shot below). There are three check box options that let you configure Balloon for every extraction.

- The “Prompt before overwriting” check box lets you tell Balloon what to do in the case a duplicate file is encountered while extracting. If this



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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 overwrite the existing file, should be skipped, or should be renamed (see screen shot below). You can also cancel the entire extraction process. If this check box is not checked, Balloon will always overwrite existing files without bringing up a dialog. Be very careful when you turn this option off!



- The “Prompt on every extraction” check box tells Balloon to present the Standard File dialog for every file in the archive. You can then choose a different destination folder for every file that you extract. If this check box is not checked, Balloon will extract all the files in the archive into the folder that you initially select. (Note that you can turn this check box off at any time and Balloon will extract the remaining files into the last folder that you specified.)
- The “Open after extraction” check box tells Balloon to ask system extensions to open the extracted file immediately after it is extracted. For example, if you are extracting text files and you have a system extension which can open text files (such as the EGOed light text editor [which just happens to be included with this version of Balloon!]) then after each file is extracted, the file will be opened by the extension. For an example of this in action, see Chapter 8.

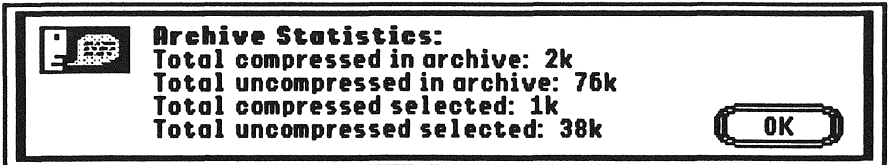
Info on "Test.File"	
Name: Test.File	
Kind: Unknown	
Access: Unlocked, Visible	
FST: ProDOS/SOS	Created: 1/17/95 12:28:00 PM
FileType: \$04	Modified: 1/17/95 12:29:00 PM
AuxType: \$0000	Archived: 1/17/95 12:39:53 PM

Getting Information on Archived Files

Balloon allows you to view most of the stored file information for archived files. To view the file information for the selected files in the file list, click on the Info button or press "Command-I". Unlike GS-ShrinkIt, which only allows you to view information on one file at a time, you can open as many information windows as memory allows. For files without comment records, a simple information window is shown (see above screen shot). For files with comment records, a full information window is shown complete with a box for you to view and edit the comment information attached to the archived file (see the screen shot below). After you have edited the comment information, you must click on the Update button or press "Command-U" to save the new comments to the archive. (Note that the comment record can only contain a fixed number of comment characters. If a comment is larger than the allocated comment record, as much comment information as possible will be saved.)

Info on "Test.File"	
Name: Test.File	<input type="button" value="Update"/>
Kind: Unknown	
Access: Unlocked, Visible	
FST: ProDOS/SOS	Created: 1/17/95 12:28:00 PM
FileType: \$04	Modified: 1/17/95 12:29:00 PM
AuxType: \$0000	Archived: 1/17/95 12:34:09 PM
This information window contains comments.	
<input type="button" value="Home"/> <input type="button" value="Down"/>	

If you hold down the option key and click on the Info button, some archive statistics are calculated and shown in a statistics window (see screen shot below). The statistics window will show the total of all the compressed file sizes in the archive and the total size of all the files if they were to be uncompressed. Also shown is the total of all the selected compressed file sizes in the archive and the total size of the selected files if they were to be uncompressed. You can use the statistics window to see if you have enough room on a disk to extract the compressed files.



Sorting Files in an Archive

You can sort the files in an archive by clicking on the Sort button. Balloon supports sorting the files based on ascending filename order only. If you need more extensive sorting options, such as sorting in either ascending or descending order by the length of the uncompressed file, amount of compression, archived data, file type, or auxiliary type, you should use GS-ShrinkIt.

Deleting Files From an Archive

To delete files from an archive, first select the files you want to delete and then click on the Delete button. There must always be at least one file in an archive, you cannot delete all the files from an archive.

Note that Balloon allows you to delete files from archives which are encapsulated. You must be extra careful when you delete files from encapsulated archives simply because the wrapper information which comes before the ShrinkIt archive in the file may contain specific information such as the length of the ShrinkIt archive, and deleting files from the archive would render that information invalid.

Adding Files to an Archive

To add files to an archive, click on the Add Files button. A Standard File dialog will appear (as shown in the "Creating a New Archive" section of chapter 3) allowing you to select the files you wish to archive. To select a file to archive, you click on it in the list of files. To select a contiguous range of files, you click on the first file in the range then hold down the shift key and click on the last file in the range. To select (and deselect) files in any order, hold down the Command key and click on a file to

toggle its selection state. The check box options seen in the dialog are described fully in the “Creating a New Archive” section in chapter 3.

Note that Balloon allows you to add files to archives which are encapsulated. You must be extra careful when you add files to encapsulated archives simply because the header information which comes before the ShrinkIt archive in the file may contain specific information such as the length of the ShrinkIt archive, and adding files to the archive would render that information invalid.

During the archiving process, a dialog is shown which informs you of the archiving progress. You can click on the Stop button (or press Command-period, or press the escape key) at any time to force Balloon to stop archiving the files.

Selecting All the Files in an Archive

To select all the files in the file list, click on the Select All button or press Command-A.

5. The Balloon Finder Interface

Balloon was written to take extensive advantage of the Finder. When in the Finder, there are many shortcuts you can use to invoke Balloon. Note, however, that you can always use the Balloon new desk accessory to perform the same functions, even when you are in the Finder. The Finder just presents a more elegant and quicker interface for some tasks.

Opening Archives

When in the Finder, you can open a ShrinkIt archive by selecting its icon and choosing the Open menu item from the Finder's File menu, or simply by double-clicking on the archive icon. Balloon will automatically open the archive and present an archive list window. (Be sure to look at chapter 3, "Balloon Basics," to see what effects the "Applications Get Files First" and "Look In Files" preferences have when opening archives with the Finder.)

If you hold down the option key when you open an archive, Balloon will not display the archive list window. Instead, Balloon proceeds as if you had opened the archive normally, selected all the files in the file list, and then clicked on the Extract button. A Standard File dialog then appears which lets you choose where you want your files to be extracted to.

If you hold down the control key when you open an archive, Balloon will immediately start extracting all the files in the archive to the same folder as the archive itself. No Standard File dialog will appear.

Extras

Balloon adds three menu items to the Extras menu in the Finder. They are:

- **Balloon Preferences** - Selecting this menu item is a quick way to bring up the Balloon preferences dialog as described in the "Setting Balloon Preferences" section in Chapter 3 without using the Balloon desk accessory.
- **Open Archives** - Selecting this menu item will force Balloon to scan the selected files and open any files that are archives. Note that the "Look In Files" preference is ignored because when you choose the Open Archives menu item files will always be looked in. The reason for the Open

Archives menu item is because some ShrinkIt archives may actually have an incorrect file type and if you attempt to open them with the Finder, another program may claim the archive before Balloon sees it. For example, if you have a text editor desk accessory installed in your system and you have a ShrinkIt archive with an incorrect file type which labels the archive as a text file, the text editor may attempt to open the archive before Balloon has a chance to look at it. Using the Open Archives menu item tells Balloon, and Balloon only, to attempt to open the selected files.

- **Archive Files** - This menu item tells Balloon to take the selected files and place them all in a new archive. A Standard File dialog will appear to let you give your new archive a name.

6. Using the Balloon XCMD For Spectrum

The Balloon XCMD for Spectrum works only with Spectrum v2.0 and later. It will not work with any earlier version of Spectrum, and it does not work with any other telecommunications program. If you don't have Spectrum v2.0 or later, you can safely ignore this chapter and chapter 7. Spectrum is sold by Seven Hills Software, Inc. If you need more information on Spectrum, contact Seven Hills Software at 2310 Oxford Road, Tallahassee, FL, 32304-3930. Phone: 904-575-0566.

With the Balloon XCMD installed, Spectrum can take advantage of many of the features in Balloon. If you are a script author, you can even use the Balloon XCMD to ask Balloon to perform functions such as archiving and extracting files, as described in the next chapter.

The main function of the Balloon XCMD, however, is to automatically extract the files from any ShrinkIt archives you download. The Balloon XCMD is told whenever a file was successfully downloaded. The Balloon XCMD then remembers all the downloaded archive files, and when Spectrum isn't busy, the Balloon XCMD asks Balloon to extract the files from the downloaded archives. (It should be noted that Spectrum is almost *always* busy, so Balloon usually waits to extract the files you have downloaded when you are quitting Spectrum. However, you can force Balloon to extract the files you have downloaded by running the short script "EXTERNAL Balloon Expand". See chapter 7 for more details.)

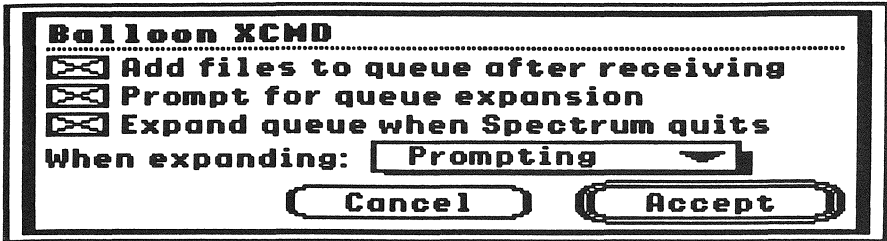
Balloon XCMD Preferences

The Balloon XCMD maintains a set of preferences which tells the XCMD what to do. To view the preferences, you need to write a script which tells the Balloon XCMD to display its preferences window. This is a simple process which anybody, even people who are intimidated by scripts, can do.

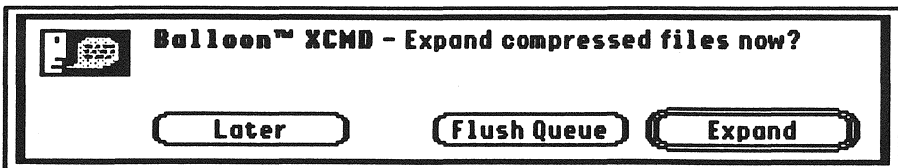
First, open up the Spectrum editor by choosing the Editor menu item from the Show menu. Then make sure you have an empty editor window by pressing Command-N. Finally, type the following script into the editor window:

```
EXTERNAL Balloon
```

Now, choose the Run Editor as Script menu item from the Script menu. The simple script you typed into the editor window will then be run. The script simply tells the Balloon XCMD to display its preferences window (see screen shot below), which contains the following preferences:



- The “Add files to queue after receiving” check box controls whether or not the Balloon XCMD queues files after a download. When this check box is checked, the Balloon XCMD remembers all archive files which are successfully downloaded. When this check box is not checked, the Balloon XCMD will not queue any downloaded files for later expansion.
- The “Prompt for queue expansion” check box controls what the Balloon XCMD does when there are files queued for expansion and Spectrum is not busy. When this check box is checked, the Balloon XCMD will present you with a dialog asking what should be done with the queued files (see screen shot below). If you click on the Later button, the files are not expanded immediately, but are kept in the queue for later expansion. If you click on the Flush button, all queued files are forgotten. If you click on the Expand button, the queued files are then expanded. When this check box is not checked, the Balloon XCMD will automatically expand all queued archives when Spectrum isn’t busy.



- The “Expand queue when Spectrum quits” check box controls whether or not Balloon will expand any queued files before Spectrum quits.
- The “When expanding” preference is a pop-up menu that can be set to one of three values: “No Prompting,” “Prompting,” or “List View.” When this is set to “No Prompting,” archive expansion takes place immediately, just as if you had held down the control key and opened an

an archive with the Finder. (See Chapter 5 for more information on this.) When this preference is set to "Prompting," Balloon will present you with a Standard File dialog that you can use to specify where you want the extracted files to go. After you tell Balloon where to put the files, it extracts them immediately. When this preference is set to "List View," all the queued archives are opened and their archive list windows are shown. You can then choose the files you want to select from the archives and click on the Expand button yourself.

7. Scripting With the Balloon XCMD For Spectrum

With the Balloon XCMD installed, you can write scripts that tell the Balloon XCMD to ask Balloon to perform functions such as archiving and extracting files. The following commands are supported when the Balloon XCMD is installed in Spectrum:

EXTERNAL Balloon

When you invoke the Balloon XCMD without giving it any parameters, the Balloon XCMD preference dialog is displayed. (Note that the “EXTERNAL” command can be abbreviated as “EXT”.)

0

The EXTERNAL Balloon 0 {variable} command tests to see if the Balloon XCMD is present and returns its version in variable. The variable parameter after the 0 is optional. If omitted, the Balloon XCMD will simply return without generating an error. If present, the Balloon XCMD will return its version number in the variable. Using the 0 command is a convenient way to test to see if a needed XCMD is present. For example, to test for the Balloon XCMD, you'd code EXTERNAL Balloon 0 and then check to see if the Spectrum Failed flag is set. If the flag is set, the Balloon XCMD is not present. Since the Balloon XCMD checks to see if the Balloon new desk accessory is installed before installing itself, simply checking for the presence of the XCMD will insure that both Balloon components are indeed available. To get the version of the Balloon XCMD, you'd code EXTERNAL Balloon 0 Vers and then the Spectrum variable Vers will contain the version number.

Queued

The EXTERNAL Balloon Queued [variable] command returns the number of archives queued for expansion in variable. For example, to get the number of queued files, you'd code EXTERNAL Balloon Queued Num and then the Spectrum variable Num will contain the number of queued archives.

Queue

The `EXTERNAL Balloon Queue [pathname]` command adds an archive to the queue for later expansion. For example, to queue the `:Balloon:Sample.SHK` file for later expansion, you'd code `EXTERNAL Balloon Queue ":Balloon:Sample.SHK"`.

Expand

The `EXTERNAL Expand {pathname}` command tells the Balloon XCMD to expand archives. The `pathname` parameter after the `Expand` is optional. If omitted, the Balloon XCMD will expand all the archives in the queue. If present, the Balloon XCMD will expand the archive referenced by the given `pathname`. For example, to expand all the archives in the queue, you'd code `EXTERNAL Balloon Expand`. To expand the `:Balloon:Sample.SHK` file, you'd code `EXTERNAL Balloon Expand ":Balloon:Sample.SHK"`.

Flush

The `EXTERNAL Balloon Flush` command removes all archives from the queue without expanding them. For example, to flush the queue, you'd code `EXTERNAL Balloon Flush`.

Prefs Get

The `EXTERNAL Balloon Prefs Get [preference] [variable]` command returns the preference setting for the named preference and returns its value in `variable`. Valid values for the preference field are `AddToQueue`, `ExpansionPrompt`, `ExpandOnExit`, or `DestinationPrompt`. For example, to get the value of the "When expanding" preference, you'd code `EXTERNAL Balloon Prefs Get DestinationPrompt Pref`. The `Pref` variable would then contain the value 1 for "No Prompting," 2 for "Prompting," and 3 for "List View." (All preferences other than the `DestinationPrompt` preference return zero for "off" or one for "on.")

Prefs Set

The `EXTERNAL Balloon Prefs Set [preference] [variable]` command allows you to change the preference setting for the named preference. Valid values for the preference field are `AddToQueue`, `ExpansionPrompt`, `ExpandOnExit`, or `DestinationPrompt`. For example, to set the value of the `When`

expanding preference to “Prompting,” you’d code `EXTERNAL Balloon Prefs Set DestinationPrompt 2`. The `DestinationPrompt` preference uses the value 1 for “No Prompting,” 2 for “Prompting,” and 3 for “List View.” All preferences other than the `DestinationPrompt` preference use zero to turn the preference off or one to turn the preference on. (Note that when you set a preference by issuing a script command, the preference is only set *temporarily*. The next time Spectrum starts up, the Balloon XCMD will reload its preferences from the preferences file. The only way to *permanently* change the preference is by using the preferences dialog.)

Create

The `EXTERNAL Balloon Create [archivepathname] [pathname] [reference]` command tells the Balloon XCMD to create a new archive referenced by `archivepathname`, add the file referenced by `pathname`, and return a reference to the new archive in the reference variable. After you have created a new archive with the `Create` command, you must close it with the `Close` command when you are done. For example, to create a new archive called `:Balloon:Sample.SHK` and add the `:Balloon:SampleFile` file to the archive, you’d code `EXTERNAL Balloon Create ":Balloon:Sample.SHK" ":Balloon:SampleFile" Ref`. Then, when you’re through with the archive, you’d have to code `EXTERNAL Balloon Close $Ref`.

Open

The `EXTERNAL Balloon Open [archivepathname] [reference]` command tells the Balloon XCMD to open an existing archive referenced by `archivepathname` and return a reference to the archive in the reference variable. After you have opened an archive with the `Open` command, you must close it with the `Close` command when you are done. For example, to open an archive called `:Balloon:Sample.SHK`, you’d code `EXTERNAL Balloon Open ":Balloon:Sample.SHK" Ref`. Then, when you’re through with the archive, you’d have to code `EXTERNAL Balloon Close $Ref`.

Add

The `EXTERNAL Balloon Add [pathname] [reference]` command tells the Balloon XCMD to add the file referenced by `pathname` to the archive referenced by the reference variable. You

can get a reference to an archive by either using the `Create` or `Open` command. For example, to open an existing archive called `:Balloon:Sample.SHK` and then add the `:Balloon:SampleFile` file to the archive, you'd code `EXTERNAL Balloon Open ":Balloon:Sample.SHK" Ref` to open the archive, then `EXTERNAL Balloon Add ":Balloon:SampleFile" $Ref` to add the file to the archive. Then, when your're through with the archive, you'd have to code `EXTERNAL Balloon Close $Ref`.

Close

The `EXTERNAL Balloon Close [reference]` command tells the Balloon XCMD to close the archive referenced by the reference variable. You can get a reference to an archive by either using the `Create` or `Open` command. For example, to open an existing archive called `:Balloon:Sample.SHK` and then close it, you'd code `EXTERNAL Balloon Open ":Balloon:Sample.SHK" Ref` to open the archive. Then, when your're through with the archive, you'd have to code `EXTERNAL Balloon Close $Ref`.

Additional Scripting Notes

In case you're interested, the reference returned by the `Create` and `Open` commands is actually a handle. The handle contains two words: the GS/OS `refNum` of the open archive, and the `offset` in the archive to the start of the NuFX master header. The reference is only guaranteed to be a handle with those contents for version 1.0 of the Balloon XCMD. (The moral of this story is to always check the version of the Balloon XCMD before relying on that kind of low-level information.)

The Balloon XCMD is nice enough to remember all the archives you create or open. If you forget to close them, the Balloon XCMD will close them for you. However, you should not rely on the Balloon XCMD closing your archives for you! Be a careful script writer and be sure to always close any archives you create or open.

8. Examples

Even though this manual goes into great detail to explain what Balloon can do, sometimes the best way to understand how to use something is to actually use it! So, this chapter contains several examples that you can work through yourself to get more familiar with the Balloon new desk accessory, the Balloon Finder interface, and the Balloon XCMD for Spectrum.

Of course, before you can work through these examples, you'll need to install the Balloon new desk accessory and the Balloon XCMD for Spectrum (if you have Spectrum). For information on the installation process, see chapter 2. Also, as you work through these examples, you should make sure that you are working with a *backup* copy of your Balloon disk. (For information on making a backup copy of the Balloon disk, refer to your IIGS owners manual.) Do *not* work from the original disk!

Extracting With Balloon

As an added bonus, your Balloon disk contains another new desk accessory called EGOed lite. EGOed lite is a text editor that allows you to quickly and easily edit and print text, Teach, AppleWorks Classic and AppleWorks GS word processing files. The catch is that EGOed lite is inside a ShrinkIt archive on the Balloon disk, so before you can use it, you have to use Balloon to extract it!

So, for our first example, we're going to extract EGOed lite from the sample archive on your master Balloon disk. First open the Balloon new desk accessory by choosing it from the Apple menu. After the Balloon new desk accessory window appears on your screen, click on the Open Archive button or press the "O" key and a Standard File dialog will appear. Click on the Disks button and then open the Balloon disk. On the Balloon disk there is a folder called **Examples**. Open the **Examples** folder and then choose the **EGOed.lite.SHK** archive. Click on the Accept button and an archive list window will then appear on your screen showing you the contents of the archive.

In the archive list window, select the **EGOed.lite** file and then click on the Extract button to start extracting. Another Standard File dialog will appear asking you where you want to extract EGOed lite to. Click on the Disks button and then open your startup disk. Then open the System

folder. Then open the **Desk.Accs** folder. Now, click on the **Extract** button in the **Standard File** dialog and the extraction process will start.

After the file has been extracted, you can then close the archive list window. (You can close the main **Balloon** desk accessory at any time. Closing the **Balloon** desk accessory window does not effect any open archive list windows.)

Now, restart your **IIGS**. If you've correctly placed **EGOed lite** in the **System:Desk.Accs** folder on your boot volume, the **EGOed lite** item will appear under your **Apple** menu. (If **EGOed lite** *isn't* in the **Apple** menu after rebooting, work through this example again. Make sure that you extract **EGOed lite** to your *startup* disk! It won't work from any other disk!)

Creating an Archive With Balloon

Next, we'll create a new archive and place the **a.Read.Me** file from your master **Balloon** disk in the archive. First open the **Balloon** new desk accessory by choosing it from the **Apple** menu. After the **Balloon** desk accessory window appears on your screen, click on the **New Archive** button or press the "N" key and a **Standard File** dialog will appear. Click on the **Disks** button and open the **Balloon** disk. Select the **a.Read.Me** file located on the **Balloon** disk and click on the **Accept** button. A second **Standard File** dialog will appear asking you what to name the archive. Click on the **Disks** button again, and open another disk (if you have one, a **RAM** disk will do nicely). *Do not save the new archive on your Balloon disk!* Now click on the **Save** button. A new archive containing the **a.Read.Me** file will then be created on the disk you have selected. (If you didn't change the default name that **Balloon** gave you, the new archive will be called **Archive.SHK**. This is the name we'll use for the remaining examples.)

Extracting From Inside the Finder

For our next example, we're going to extract the **a.Read.Me** file you just archived, but we're going to do it from the **Finder**. First you need to be in the **Finder**. Now, using the **Finder**, locate the **Archive.SHK** file that you just created in the previous example, and then double-click on it. **Balloon** will see that double-click and open the archive for you. An archive list window will then appear on your screen showing you the contents of the archive. You can now extract files from the archive just as you did earlier.

(Remember that there are two shortcut methods to extracting files when you are in the **Finder**. The first shortcut is to hold down the option key

when you double-click on an archive. This will not bring up the archive list window, but will instead immediately present you with the extraction Standard File dialog to let you extract all the files from the archive. The second shortcut is to hold down the control key when you double-click on the archive. This will immediately begin extracting all the files in the archive into the same folder the archive itself is in.)

Creating an Archive From Inside the Finder

For our next example, we're going to create another archive containing the **a.Read.Me** file, and we're going to do it from inside the Finder. First you need to be in the Finder. Next, put the Balloon disk in a drive and then open the Balloon disk. Use the mouse to select the **a.Read.Me** file and then choose the Archive Files menu item from the Finder's Extras menu. A Standard File dialog will appear asking you what to name the archive. Click on the Disks button again, and open another disk (again, if you have one, a RAM disk will work great). *Do not save the new archive on your Balloon disk!* Now click on the Save button. A new archive containing the **a.Read.Me** file will then be created on the disk you have selected.

Extracting and Using Extensions to Open

For this example, we're going to demonstrate one of the more useful aspects of Balloon: Automatically opening a file after it has been extracted. For this example, you're going to need the EGOed lite new desk accessory correctly installed in your system. To do this, simply follow the instructions in the first example, and make sure that EGOed lite is properly installed in your system.

Now, using the Finder, open the Balloon disk and then open the Examples folder. Now, double-click on the **EGOed.lite.SHK** archive to have Balloon open the archive for you. When the archive list window appears, select the file **EGOed.lite.Docs** and click on the Extract button. When the extraction Standard File dialog appears, click on the Disks button and then open a disk other than your Balloon disk. At this point, make sure the "Open after extraction" check box (which is at the bottom of the Standard File dialog) is checked. Then, click on the Extract button. The EGOed lite documentation file will be extracted from the archive, and after the extraction has finished, Balloon sends out a request asking someone to open the documentation file. EGOed lite will see the request and open the documentation file for you! (At this point, you should probably take a few minutes and read through the EGOed lite documentation to get familiar with all the features of EGOed lite.)

Downloading and the Balloon XCMD

This final example requires Spectrum v2.0 (or later) and the Balloon XCMD. This example demonstrates Balloon's ability (with the Balloon XCMD installed) to automatically extract files from the archives you download with Spectrum.

First, use Spectrum to go on-line and download a ShrinkIt archive. (Sorry, but this is one thing that we can't simulate with a file on the Balloon disk! You'll have to find and download a file yourself.) After the file successfully downloads, Spectrum will tell the Balloon XCMD that a file has been downloaded. The Balloon XCMD checks the file to see if it is an archive, and if so, it queues the archive for later expansion. Now disconnect from the on-line service. If you have a hardware handshaking modem cable, Spectrum will sense you've disconnected and will tell the Balloon XCMD that Spectrum is idle and it is safe to process queued archives. At this point, the Balloon XCMD will present you with a dialog asking you what you want to do with the queued archives. You can expand all queued archives immediately, flush all archives from the queue without expanding them, or delay the expansion for a later time.

In the **Examples** folder on the Balloon disk, you'll find another folder called **Scripts**. This folder contains three files that can make using Balloon from inside Spectrum even easier. The first is a Spectrum menu file that will provide you easy access to the Balloon XCMD preferences dialog and it will also allow you to expand the queued archives immediately without you having to learn scripting. If you're not familiar with what a menu files are, read your Spectrum documentation to get more familiar with them. (Note that if you already have a Spectrum menu file specified you should just add the contents of this file to your regular menu file.)

If you don't have a hardware handshaking modem cable, you'll have to explicitly tell the Balloon XCMD to extract the downloaded archives from the queue. To do this, you can either write a script yourself, choose the **Expand Queued Archives** menu item from the **Scripts** menu if you are using the Balloon menu file, or you can run the **E.Expand** sample script that is in the **Examples:Scripts** folder on your master Balloon disk.

Appendix 1

Changes From Balloon v1.0

For those of you who have Balloon v1.0 from *GS+ Magazine V5.N2*, there are quite a few new additions that you will immediately recognize. First off, Balloon is now a new desk accessory instead of just a Finder extension. This means that you can use Balloon from within any properly written desktop application that supports desk accessories. You'll also notice that when you open an archive with the Finder, an archive list window is shown. With Balloon v1.0, the extraction process started immediately when you tried to open an archive. If you hold down the option key when you open a file with the Finder, this version of Balloon will work in exactly the same way as Balloon v1.0 by extracting the files from the archive.

Balloon v1.0 and the new Balloon can not live together peacefully. If you used the Installer program from the Balloon disk to automate the installation of Balloon, then Balloon v1.0 will have been removed in the process. If you didn't use the Installer program, you *must* delete the Balloon file from your `*:System:FinderExtras` folder! The Installer program will also move any Balloon v1.0 preference file from the folder the Finder is in to the `Desk.Accs` folder, so if you want to retain your old preferences, you should move that file as well.

Appendix 2

Different Filename Suffixes

If you spend any time on online services, you'll notice that most, if not all, of the files have short filename extensions. Some of the more common ones you'll see will be the ".BXY" and ".SHK" suffixes. The filename extensions are an indication of the contents of the file. Below is a table of some common filename suffixes and what they mean:

<u>Suffix</u>	<u>Meaning</u>
.ACU	This is an old archive format created by the AppleLink Conversion Utility, which no one ever uses anymore. You can use GS-ShrinkIt to extract files from .ACU archives.
.ARC	This is an archive format used by MS-DOS based computers. You can use GS-ShrinkIt to extract files from .ARC archives. (The .ARC suffix is pronounced "ark.")
.BNY	This is a file or group of files encased in a Binary II wrapper. (The .BNY suffix is pronounced "bunny.") While not a true archive format, you may run across some .BNY files. Balloon will recognize ShrinkIt archives encased in Binary II wrappers, but makes no attempt to process the file if a ShrinkIt archive is not found. GS-ShrinkIt can extract any files from Binary II wrappers. Telecommunications programs use the Binary II wrapper to preserve file attributes across file transfers. The Binary II wrapping and unwrapping process should be transparent to the user, but there are still some programs out there which ignore the Binary II standard and leave these wrappers intact.
.BQY	This is a file or group of files which are compressed using the Squeeze utility and then encased in a Binary II wrapper. GS-ShrinkIt will extract files from .BQY files.
.BSE	This is a self-extracting ShrinkIt archive encased in a Binary II wrapper. Both Balloon and GS-ShrinkIt will recognize and handle .BSE files.

- .BXY** This is a ShrinkIt archive encased in a Binary II wrapper. Both Balloon and GS-ShrinkIt will recognize and handle .BXY files. (The .BXY suffix is pronounced "boxy.")
- .QQ** This is a file compressed using the Squeeze utility. GS-ShrinkIt will recognize and handle .QQ files.
- .SEA** This is a self-extracting archive. The .SEA extension is used for self-extracting archives created by GS-ShrinkIt and by archiving programs for the Macintosh computer. Both Balloon and GS-ShrinkIt will recognize and handle .SEA files created by GS-ShrinkIt. Note that you don't need either Balloon or GS-ShrinkIt to extract files from self-extracting archives, you can always just launch the archive as an application and the files will be extracted for you. The only way to extract files from the Macintosh self-extracting archives is to launch the application on a Macintosh. (The .SEA suffix is pronounced "sea.")
- .SHK** This is a ShrinkIt archive. Both Balloon and GS-ShrinkIt will recognize and handle .SHK files.
- .SIT** This is a StuffIt archive. This is the archive standard for Macintosh computers. GS-ShrinkIt will recognize .SIT files and can extract files from the archive unless they are contained in a folder in the archive. (The .SIT suffix is pronounced "sit.")
- .TXT** This is a standard ASCII text file. You can use any text editor or word processor to view this file. (The .TXT suffix is pronounced "text.")
- .Z** This is a file compressed with the Unix Compress utility. GS-ShrinkIt will recognize .Z files and can expand them.
- .ZIP** This is an archive format used by MS-DOS based computers. Neither Balloon nor GS-ShrinkIt will recognize .ZIP archives. However, there is at least one shareware IIGS program, PMPUnZip, that can extract files from .ZIP archives. (The .ZIP suffix is pronounced "zip.")
- .ZOO** This is an archive format used by MS-DOS based computers. You can use GS-ShrinkIt to extract files from .ZOO archives. (The .ZOO suffix is pronounced "zoo.")

Appendix 3

LZW Compression

To compress data, Balloon uses a compression algorithm called "LZW." "LZW" stands for "Lempel-Ziv-Welch" — the three people responsible for the creation and evolution of the algorithm. LZW is a good method of compressing data which has repetitive properties, but does not necessarily consist of repetitive runs of identical bytes. 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:

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