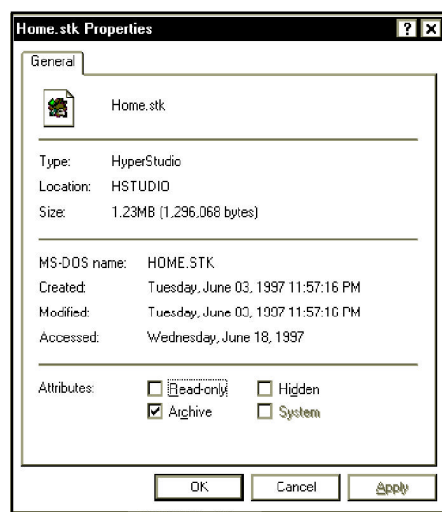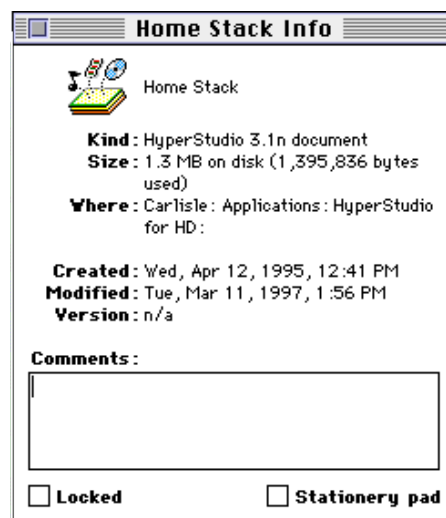# Storing Your HyperStudio Projects

Welcome to the wonderful world of multimedia. Multimedia elements like sounds, graphics, animation and movies can make projects interesting and exciting, but also very complex. The good new is, to a large extent, HyperStudio manages both disk and memory use, so that in the usual course of events, you don't have to know anything about the inner workings of the process. A good understanding of what is going on in your computer, however, will help you extend your use of HyperStudio. This document provides several tips on how to save and store your projects to get the most from your HyperStudio multimedia experience.

Size of files

Knowing the size of each of the files you wish to include as part of your project may help you better organize those files for storage and future duplication. For example, if your movie files are extremely large, you may wish to use editing software to try to change (increase) the rate of compression to make the file size more manageable.
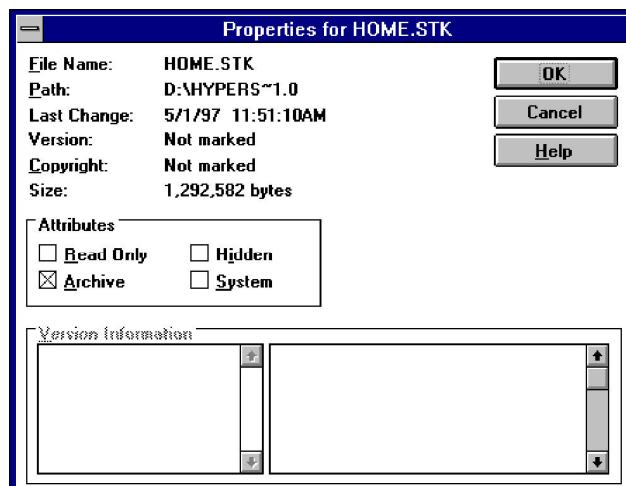
You can determine the size of a sound, graphic, stack or any other type of file using your system software. If you do not know the location of the files on your hard drive or other storage media, use the Find/Search command in your operating system. Once you have located the file, you can find out it's properties, including the file type, size and other useful information.

Macintosh. Find the file on your computer. Single click on the file to highlight it. Once it is highlighted, go to the File menu and select "Get Info".
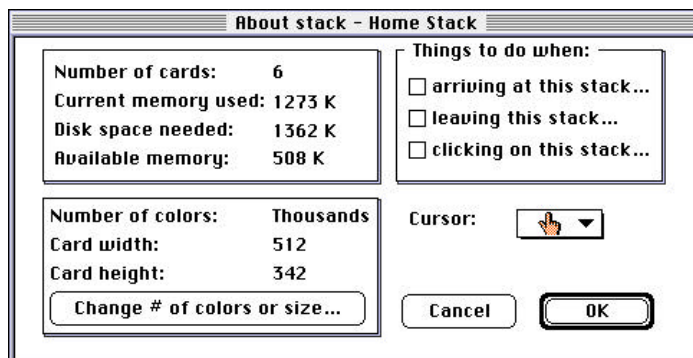
Windows '95. Once you have located your file, click on the file using the secondary mouse button (usually the right button) and select "Properties".

Windows 3.x. In the File Manager, locate your file and highlight it. Under the File menu select "Properties".

You can also see your file properties while working in HyperStudio. Under the **Objects** menu, select "About this Card" or "About this Stack". This will give you information on the memory usage, stack size, and disk space needed.

The "About this Stack" screen will also give you information on the card size and number of colors in your stack. Smaller card size and a smaller number of colors will reduce memory requirements and overall disk space needed.
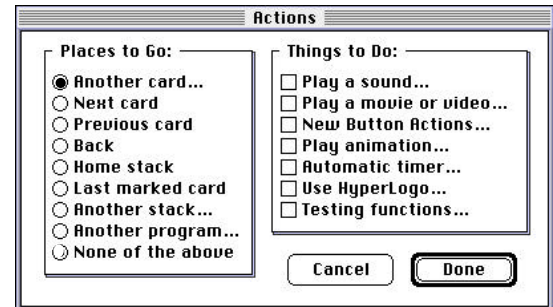
Keeping individual stack size small

Since multimedia projects can be memory intensive, it is helpful to keep your stack size small. This will also make storing and sharing your projects easier. A good rule of thumb is to make each of your stacks about 1MB or 10 cards, whichever comes first (check "About this Stack" under the Objects menu). For example, if you are saving your project onto floppy disk media you have a limit of about 1.3MB of storage space for your stack. While floppy disks hold 1.4MB of information, you must account for a little "overhead" for the disk file structure.

This does not mean that you cannot create large HyperStudio projects. While you can create a large project that consists of one very large stack, HyperStudio also allows you to create a large project that consists of many small stacks which link together. HyperStudio allows you to easily connect stacks together at the Actions menu.

To link your stacks or cards together, choose the "Another Stack" or "Another Card" option under Places to Go at the Actions menu. The "Another stack" option will open a dialog box that allows you to select a stack. This option will link to the first card in the other stack. The "Another Card" option allows you to link to another card in either your existing stack or in another stack. When the dialog box appears for you to navigate to another card, go to the menu bar and choose **File**, "Open Stack" (Command+O for Mac, and Control+O for Windows). You can now navigate to the card you desire in this second stack.

Keeping your stack size small will make it easier to transport using a floppy disk. As an added benefit, if something were to happen to your file, only a small amount of work would have to be repeated.

If you look under the File menu, you will notice that HyperStudio does not have a "Close Stack" option. When you choose "Open Stack" or use a button to link to a different stack, HyperStudio automatically closes the open stack. HyperStudio will open only one stack at a time into RAM. Therefore, if you make small stacks which link together, they will load faster and with less memory requirements making it much easier to share your stacks on computers with little RAM.

Media files and HyperStudio

Sounds
Adding sounds will quickly add to the size of your stack. For example, for each second of sound recorded HyperStudio will add about 5 K to the size of a Macintosh stack and about 10K to a Windows stack. On the Macintosh, HyperStudio compresses the sounds you record by a factor of 6:1. If you press the Command or Option key for better quality, the compression decreases and the recorded files are larger. If you are recording sounds in HyperStudio make sure to give each new recorded sound a distinct name. Recording sounds in HyperStudio will make the sound part of your stack, unless your Preferences (in the HyperStudio **Edit** menu) are set to "experienced user" (this option will be explained later).

Graphics
Graphics that are imported into HyperStudio are automatically optimized and compressed. The resulting size of these files depends heavily on the color depth of your stack. You can find this information under the **Objects** menu at "About This Stack". Here are two examples of file sizes *(Africa* and the *Boy With Boats)* in stacks of varying number of colors. Using a 640X480 card size and adding the images as backgrounds produces the following results:

Image	16 color	256 color	1000's of colors
Africa	24K	45K	81K
Boy With Boats	69K	131K	281K

Text
Text information requires 1 byte of disk space per character, a small amount compared to other media elements in a typical multimedia project. At about 3000 characters per page, you can store about 450 pages on a 1.4MB floppy disk!
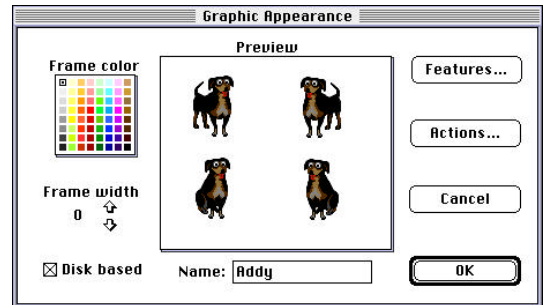
Movies
Unlike backgrounds and sounds, movies do not become part of your stack, but remain on your hard drive or CD ROM. The buttons you add to play movies simply remember the path to the movie files. If you want to take your stack to another computer or storage device, you will have to copy/transport your movie files also. If you are moving to a Windows computer, you will also have to make your movies cross-platfrom (see the Sharing Your Stacks flyer).

If you are recording movies in HyperStudio (.AVI or .MOV), you have options for compressing the movies as you record. The compression options will depend on the software that comes with your video digitizing card. The more compression you use, the smaller the movie. Creating these movies will take more time, but the resulting file size may be worth the wait. Consult your video digitizing software manual for information on compression, or just experiment. Video editing software will also give you options for compressing movies that have already been created.
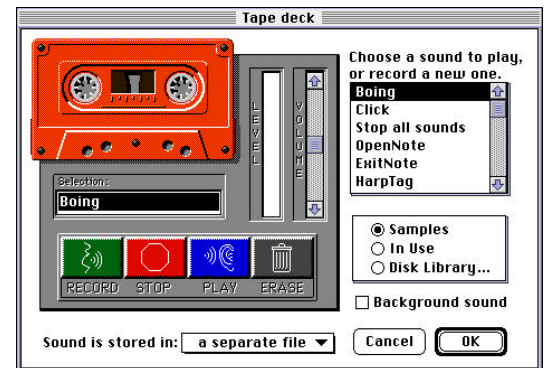
Storing Sounds and Graphics Externally

You can tell HyperStudio to store your graphics and/or sounds externally as "an experienced user" in HyperStudio. Under the HyperStudio **Edit** menu, choose "Preferences" and check "I'm an experienced HyperStudio user",

At the Graphic Appearance menu (after you have placed a graphic on the screen) you will notice a check box, in the lower left corner, marked "disk based". If you place a check in this box, before clicking on 'OK", your graphic will be stored outside of the stack and HyperStudio will point to the original file on your hard drive (much like it does with a QuickTime movie). Remember that if you move your stack to another machine or storage device, the graphics must be moved as well and have a path to the file that is identical to the one on the original machine. This works when you have added a graphic from a "disk file"; graphic objects captured from video or changed from Clip Art cannot be made "Disk Based".

You can also store your sounds externally. In the lower left corner of the "Tape deck" (Play a Sound) menu, you will see a pull down box labeled "Sound is stored in". The default for this option is "in the stack". If you pull down this box and choose "a separate file", your sounds will be stored as separate sound files on your hard drive. If you are recording sound or choosing an existing digital sound file, Hyper-Studio will ask you where you would like to save your file and what you would like to name it. If you are recording multiple sounds, give each of your recorded sounds a separate name, this will avoid the likelihood that a large number of "new sound" files will be confused later on.
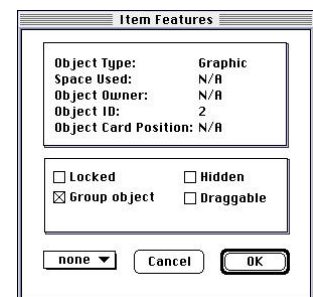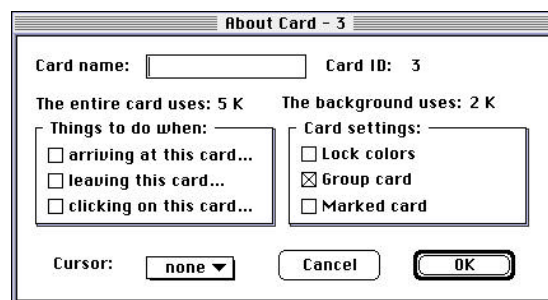
Storing sounds and graphics externally will make your stack size smaller, but it may not decrease the overall project size. You still need to store and save these external files if you are moving or sharing your project on another computer. Storing sounds and graphics externally, greatly decreases the size of your project if you are using the same graphic or sound multiple times. If you add a 60K graphic file to your stack five times, the total space needed is 300K. If you make this graphic disk based, the storage space needed is only 60K since HyperStudio is accessing the same file several times.

You can also use this HyperStudio function to extract sounds from existing HyperStudio projects. Simply choose "Disk Based" or "a separate file" and save your files to the desired location on your hard drive or other storage media.

Group Objects

As an "experienced user", you have the option of making cards and objects "grouped" items. Group cards can share backgrounds and grouped Objects. Sharing backgrounds and objects between cards takes up the memory of only one background or one object. This is similar to making items disk based only they are stored within the stack. This is a handy option if you are making a stack with many cards that have the same background or many buttons or graphics that have the same action throughout the project.

A card can be made part of a group by choosing **Edit**, "Ready Made Cards", Group Card. This makes a copy of your original card and designates both of them as Group Cards. You can check for this designation under the **Objects** menu, "About this Card".

You can also group objects in your stack, such as buttons, graphics, and text objects, by checking the "Group Object" box in each Objects' Features menu. When you choose "Ready Made Cards", Group Card, all objects that have been designated as grouped on that card will also appear on the new card complete will all features and actions. If you would like one of the buttons or graphics to have a different action, go the features menu of that object and uncheck "Group Object" BEFORE changing the action. If you do not uncheck this option, the action changes on all of those objects in the group.

Storage Devices and Media

Floppy Disk
While the floppy disk is the most transportable media, it is also the least reliable. Floppy disks should be used as a storage and back up media. If you are working directly from a floppy disk you may (sooner or later) come across a disk related problem. If a portion of a file is written on a bad block or sector your file may become damaged and not able to be opened. Rewriting a large file repeatedly to a disk increases the chance this may happen. Remember, a multimedia file is much more complex than a word processing document.

Floppy disks can hold up to 1.4 megabytes of information. To avoid "out of memory" errors, monitor the size of your stack and the disk space needed by checking in "About This Stack" under the **Objects** menu in HyperStudio. If you can save your stack to the hard drive before copying it to a disk, you can also run a compression program like Stuff-It or WinZip.

Taking a floppy from one computer to another can sometimes cause a file to become damaged. This can be due to the fact that head alignment can vary from one disk drive to another and/or a disk drive needs to be cleaned. The preferred method is to work from the local hard drive and then copy to the floppy disk using the system software when the project is completed.

Hard Drive
This is usually the most reliable storage media. If you have ample disk space you can even do a "file/save as" and save your file(s) with slight modifications. Hard drives have a faster access time than other media. A faster access time, will make your stacks run faster and smoother (compared to running off of a floppy disk or a CD-ROM).

Zip/Jaz/SyQuest and other removable storage
Zip drives allow you to move up to 100MB of data from one computer to another. The access time is somewhat slower than a hard drive, so you may want to use this media for storage (like a floppy). You can build and run stacks on a Zip drive. If you are doing this it is probably a good idea to save several versions of your project (this is always a good idea, especially with "important" files).

Jaz drives (SyQuest and others) operate much like a removable hard drive. You can build stacks on this media and it will operate much like on a local hard drive. Since the media is removable you should be very careful when transporting and storing.

CD-ROM
You can "burn" your project to a CD-ROM to preserve or to share them once they are completed. Here are some simple steps to follow to help you get your project onto a CD. You should consult the software manual and guide for the specific hardware/software you are using.

1. Start with a "clean" hard drive or partition - a formatted hard disk, SyQuest cartridge, or Jaz disk without any data on it. You are less likely to run into problems transferring data from a drive that is separate than the one that contains the active system software.
2. Run a utility such as Norton Disk Doctor (or something similar) to check for bad blocks or sectors on the disk.
3. Transfer you project and the player to the clean error free drive. Test your project to make sure it is working correctly and all the links, buttons and other actions function properly. Remember to transfer any disk based sounds, graphics, and movies.
4. Run a de-fragmentation utility such as Norton Speed Disk (or similar) to optimize the data on the disk. This will help the program and stacks run smoother and faster. This will also reduce the chances of a "blank spot" showing up on the CD. Since a CD has a slower access time than a hard disk, any non-continuous blocks can cause errors or delays in accessing information.
5. Test your project again. If everything still works correctly, it should work on your CD and any problems that are found on the CD are likely to be due to the fact the information was written incorrectly to the CD media. Consult your specific CD-ROM making software guide before attempting to make a CD.
6. Test your CD on several machines. A CD that works on one machine may not work on all machines. If you are making a cross-platform project, you should test on machines of both platforms.

A Final Note About Stack Evaluation

Since graphics, sounds and movies can increase memory requirements and disk space needed, you may want to discuss with your students effective and appropriate use of media. It can be easy to get caught up in the "bells and whistles" and lose sight of content in your projects. Encourage your students to ask questions like:
    Does this media or effect contribute to the content of my project?
    Does this media or effect distract from my message or enforce it?
    What is the most effect way to explain or share this idea?
Asking these questions during the planning and creation process may help keep stack size down by encouraging students to weed out media and effects that are not absolutely necessary for their projects.