# THE PAINTER 4 WINDOWS
# TIPS AND HINTS GUIDE v4.0

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Note: text in blue is linked. Click on any blue word to jump to that section.

# 1. Introduction

Welcome to the Painter 4 Tips and Hints Guide!

In these pages, we at Fractal Design Technical Support have attempted to provide you with a clear, simple reference for some of the most common problems or questions you may encounter while using Painter. This guide is not intended to replace the Painter 4 User Guide, the Painter Tutorial, the Tech Notes, nor the Read Me file included with Painter. Instead, here we've included some of the most common technical questions we receive from you, the enduser, and offer ideas and hints for more exploration.

The document is divided into several sections. Chapters 2 through 5 deal with troubleshooting. Chapters 6 and 7 are concerned with techniques, like cloning and color output. And Chapter 6 provides a guide for buying a graphics tablet.

The Tips and Hints Guide is an electronic document created with Adobe Acrobat. You can use the Acrobat Reader to navigate the document either by scrolling through pages, or by clicking on text in blue to jump directly to that section. You can also print out part or all of the Guide by selecting Print under the File menu.

If you can't locate the answer to your question in this document or in the other literature that comes with Painter, feel free to contact us.

Happy painting!

## 2. Windows 95 Issues

Windows 95 introduces the brave new world of 32-bit addressing to PC applications software. What is 32-bit addressing? It is simply the ability to process information in 32-bit chunks instead of 16-bit chunks, as was the case in all earlier versions of Windows. As an end user, this doesn't really affect the way Painter or any of your other applications work. Applications running under Windows 95 may be slightly faster than those running under Windows 3.1, both becuase of the incremental advantage of 32-bit addressing and because of the overall efficiencies that Microsoft has brought to the Windows 95 environment.

Fractal Design has created two versions of Painter 4 for Windows: a 16-bit Windows 3.1 application and a 32-bit native Windows 95 application. We believe creating 2 applications is the best way to optimize the performance of Painter for each environment, and the experience of our users. Painter 4 uses a "smart" installer which automaticlly installs the appropriate version of Painter depending on the version of Windows you are running. There are some special considerations you should keep in mind when running 3rd party plug-ins under these two environments.

Like application programs, all plug-ins must be written to work in a 16-bit or 32-bit operating environment. These plug-ins include acquire and export plug-ins such as scanner plug-ins, and filter plug-ins such as Kai's Power Tools and Adobe Gallery Effects. You must use the appropriate version of these plug-ins with the version of Painter you are running. ***You should use 16-bit plug-ins with the Windows 3.1 version of Painter and 32-bit plug-ins with the Windows 95 version of Painter.*** Contact your plug-in vendor to make sure that you are using the appropriate version of their plug-in with the version of Windows that you are running. This rule also applies to TWAIN drivers used for scanners.

Note: Adobe Photoshop for Windows 3.0.4 and later uses a technique called "thunking" to allow 16-bit plug-ins to run "emulated" under Windows 95. Because of the performance implications, Fractal Design chose not to implement this technique. If a plug-in runs under Photoshop, but not under Painter, it is probably due to 16/32-bit considerations, rather than overall compatiblity issues.

# 3. Tips on Windows Memory Management

This chapter describes how to make Painter run better by maximizing your available memory and hard disk space. It includes the following sections:

- **Painter seems to be running very slowly on my system. How can I get it to run faster?**
    - Change Painter's memory preferences.
    - Reduce the disk cache size in Windows.
    - Disable EMM386.EXE.
    - Reduce the number of installed fonts.
- **I think I have plenty of RAM. I keep getting a message that says I have "Insufficient Space on Disk to Open New Picture."**
    - Windows virtual memory
    - Painter's virtual memory.
- **Hmm, when I scanned the image it said it was only 200K but when I try to open it in Painter it says it will be almost 5MB.**

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PC's these days come with a range of memory configurations from 4 megabytes of RAM to up to 32 or more megs. This is the physical memory actually installed inside the computer. The first megabyte of memory is used by DOS and DOS applications and is called *conventional memory.* Everything above the first megabyte is usually called *extended memory.* Windows applications like Painter use extended memory to do their work, so the more free extended memory you have available, the better Painter will run.

### *Painter seems to be running very slowly on my system. How can I get it to run faster?*

Painter may not have enough RAM available to handle the image you are working on. This occurs frequently if you are working on large images, editing multiple images simultaneously, or if you are

running other applications at the same time as Painter. The solution is to somehow increase the amount of free RAM that Painter has available for use. This can be done in several ways.

**1. Change Painter's memory preferences.** You can choose between two available memory settings within Painter: Half Memory, and Maximum Memory. These settings are found within the Edit menu under Preferences: Windows. Half Memory means Painter will "grab" only part of the available RAM it finds. Use this setting if you are working on only small images or movies, or if you must run other applications simultaneously with Painter (running other applications with Painter is not recommended). Maximum Memory means that Painter will use nearly all the available RAM on your system. Use this setting if you are working on moderate to large images or movies, or multiple images at the same time. Maximum Memory may cause the program to take longer to start up, and can sometimes cause printing difficulties on low-memory systems.

**2. Reduce the disk cache size in Windows.** The disk cache is a software utility that uses extended memory to store information going to and coming from the hard disk. This is done to significantly speed up disk access.

### Windows 95:

Windows 95 has a built-in disk cache that is configured automatically. There should be no need to alter this cache as far as Painter is concerned.

### Windows 3.x:

Windows 3.1 uses Smartdrive as the disk cache. Windows 3.11 has an option to use 32-Bit File Access, which has its own disk cache. In either case, you can specify the size of the cache in Windows. Reducing the cache size can slow down disk access somewhat, but it also will free up extended memory that programs like Painter can use to hold data. Therefore, the best idea is to strike a balance. *On systems with 8 megs of RAM (the minimum required for Painter 4), we usually recommend you set the disk cache size to about 256k, which is significantly less than the default size.* On systems with more memory, you can experiment with larger cache sizes. Here is how you change the cache size:

> **Smartdrive:** Using a text editor in Windows or DOS, edit the file C:\AUTOEXEC.BAT. Look for the line which loads Smartdrive, which will look something like:
> C:\DOS\SMARTDRV.EXE

There may also be some numbers at the end of the line. Change or add numbers to the end so the line reads:
C:\DOS\SMARTDRV.EXE 2048 256

The first number listed (2048k) is the cache size in DOS, and is not critical to Painter. You can put any number here that is reasonable for your needs. The second number (256k) is the minimum cache size in Windows. Without any numbers at the end of the line, Smartdrive defaults to a Windows size of 2048k on an 8-meg system.

Save your changes to this file and restart the computer.

**32-Bit File Access** (Windows 3.11 only): Double-click on the Control Panel icon in Program Manager. Open the section called 386 Enhanced. Click on the Virtual Memory button; then click on the Change button. Put a check in the box called "32-Bit File Access" and adjust the cache size using the text field provided. Remember, on an 8-meg system, we recommend a relatively small cache of about 256k. Confirm that the virtual memory settings in the dialog are still correct. (Windows will sometimes try to change them for you without asking!) Then, click on OK and follow the prompts to restart Windows.

Remember that if you are using 32-bit file access, there is usually no need to use a Smartdrive cache as well (except to cache CD-ROM's or floppy disks). This would just take up more memory. To disable the Smartdrive Windows cache, change the Windows cache size to zero using the method described in the previous section.

**3. Disable EMM386.EXE.** This is a DOS memory manager that, among other things, can simulate expanded memory for DOS software that requires it. *Expanded memory* is basically a less common way to address the RAM in the computer, and is not used by Windows software. In fact, if EMM386 is creating expanded memory when you boot up the computer, this area of memory will not be available to Windows. Therefore, you may be able to disable this utility to free up memory. To do this:

### Windows 95:

Windows 95 handles expanded memory automatically, and should have no need for EMM386.EXE.

**Windows 3.x:**

Using text editor in DOS or Windows, edit the file C:\CONFIG.SYS. Find the line that loads EMM386, which should look something like:
DEVICE=C:\DOS\EMM386.EXE

There may be other parameters on this line as well. To disable (but not delete) the line, insert the letters "REM" and a space in front of the existing line, like this:
REM DEVICE=C:\DOS\EMM386.EXE

Save the file and restart the computer. The computer will skip the EMM386 line.

EMM386 is required for some DOS software and for certain other purposes. If you find that disabling this utility causes problems on your system, you can remove the "REM" from the line, save the file again, and reboot to reactivate EMM386. Also note that if you are using a third-party memory manager in DOS, you are probably bypassing EMM386.

**4. Reduce the number of installed fonts.** Any font installed in Windows takes up some memory. If you have many fonts installed, you can free up some memory by removing them from Windows. This does *not* mean that you have to remove the fonts from the hard drive. You can simply uninstall the fonts from the Fonts section of the Windows Control Panel, which means you can go back later and easily add them in again.

**A note on disk compression.** Painter could also be running slowly because the program is installed on a compressed disk, or the Painter temp file is located on a compressed disk. Disk compression schemes increase the apparent space on your hard drive, but they also will slow down disk access somewhat. We recommend that, ideally, that Painter be installed on an uncompressed partition. If this is not possible, then specify an uncompressed partition as the home for the Painter temp file. Make sure the uncompressed partition has enough free space to handle the temp file. See the section below entitled "Painter's virtual memory" for details.

**A note on MemMaker.** MemMaker is a DOS utility intended to maximize the amount of conventional memory available for DOS software. It is not intended to maximize extended memory for Windows programs, so it will usually not help Painter's performance. If you've already run MemMaker and are experiencing performance problems in Painter, try undoing MemMaker's changes. Consult your DOS manual for details.

***I think I have plenty of RAM. I keep getting a message that says I have "Insufficient Space on Disk to Open New Picture."***

There is not enough space available on the hard drive for Painter's temporary file.

Remember that Windows itself, Windows fonts, Smartdrive, and other utilities take up a significant chunk of your total extended memory. On an 8-meg system this can sometimes leave only about 3 or 4 megs of physical RAM available to run applications and hold data. With Windows 95, you'll have even less. Windows, and Painter, try to get around this limitation by using virtual memory.

**Windows virtual memory.** Windows can create a file on your hard drive called a virtual memory swap file. This is a location on the disk used to temporarily hold data that won't fit in extended memory. Windows "swaps" information back and forth between this hard drive location and RAM. When you click on Help: About Program Manager in the Windows 3.1 Program Manager window , you'll see the amount of "memory" you currently have free. This number actually represents the total amount of both free RAM and free swap file space currently available. This number is deceptive when dealing with Painter, because *Painter does not use the Windows virtual memory swap file to store image data*. In other words, Painter will only use the actual free extended memory on your system to hold its images. What happens when Painter runs out of this available RAM? The answer is that Painter creates its own private swap file on the hard disk.

**Windows 95:**

Windows 95, by default, simplifies configuration by using a dyanmic swap file that suffers no performance penalties. There should be no need to alter the Windows 95 virtual memory settings.

**Windows 3.x:**

Windows 3.1 has two methods for handling Virutal Memory: temporary and permanent. The temporary swap file uses hard drive space dynamically, accessing non-contiguous hard drive space upon launch of Windows and erasing it upon exit. The permant swap file always reserves a contiguous amount of space on the hard drive. Though this may appear to be less desirable than the temporary swap file, it does have a substantial performance increase.

**Painter's virtual memory.** Painter often creates a temporary file on your hard disk to store data which "spills over" from RAM. This is Painter's "virtual memory," and it exists on the disk as a file called PAINTER.TMP. Included in this file is the image data itself, along with information required

for performing the Undo function. It also may contain masking and selection information, the Wet Layer for Watercolor brushes, and clone image data. *When opening or editing an image, Painter requires, in a combination of available RAM and hard disk space, anywhere from three to five times the working size of the file (when the number of Undo Levels is set to one). More Undo Levels require more space.*

The *working size* of a given file is typically about twice its size saved on disk. However, this can vary depending on the content of the image. To find out specifically what the working size will be, launch Painter and choose File: Open. Find the file you wish to open by navigating through the dialog box, and click on the file to highlight it. You should see a thumbnail view of the file, or the words "No Thumbnail." Below this thumbnail section is a file size indicator that will read in kilobytes. One thousand kilobytes equals one megabyte. If the working size of the file is 2954 kilobytes, Painter is going to need roughly 10 megabytes to open the image. (2954 KB is just under 3 MB. Following the rule given above, multiply by about three to get 9 MB. To be safe we'll say we need a little over 10 megs.) This 10 megabytes can be in any combination of RAM and hard disk space.

For example, on an 8-meg system, there may be 5 megs of actual RAM available after launching DOS, Windows, and the disk cache (less with Windows 95). The Painter application itself will take up roughly two megs in order to run, leaving about 3 megs available to hold image data (assuming you have Painter set to use Maximum Memory - see above for details). If the hard disk has at least 7 megs free space available, then theoretically you could open this file (3 megs RAM + 7 megs disk = 10 megs needed). In practice, never cut things this close. More free space on the disk would be safer.

On the other hand, if there is very little disk space (say 2MB), but an abundance of available RAM (20MB), again there should be no problem with storing the image data. But if 3 megs of RAM are available to Painter images and only 6 megs are available on disk, it is likely that Painter will run out of room to keep track of the image data in this example.

Also keep in mind that once the Painter temp file is created, it will not decrease in size or be deleted until you exit Painter.

**So, what do I do?** The answer to this kind of problem is to find more memory or disk space. Here are some suggestions:

1. Try freeing as much RAM as possible. See the previous section.

2. Check the amount of space available on the hard drive:

**Windows 3.x:**

Check the status bar at the bottom of the Windows File Manager, or type “DIR” at a DOS prompt.

**Windows 95:**

Double-click the “My Computer” icon, then right-click on your hard drive. Select “Properties” from the menu.

If there is very little space (under 10MB would be quite low), you will need to make some room by uninstalling applications and deleting other miscellaneous files you no longer use.

3. If you have another drive or partition with room to spare attached to your system you can tell Painter to place the temp file there. Launch Painter and choose Edit: Preferences: General. In the dialog box you will see a line that reads "Temp File Volume" with a drive letter next to it. It will probably indicate that it is set to the partition where Painter is installed. Click on the drive letter and you will see a pop-up menu of the available partitions or drives. Choose the one you want to receive the temp file. Restart the program to have this change take effect.

4. If opening a new image, try creating a smaller document. *150 pixels per inch (ppi) is the practical maximum resolution ever needed for printing to a 600 dpi laser printer.* 300 ppi is standard for 150 lpi offset presses. For more information, see the *Desktop Color Publishing for Beginners* chapter of this document.

5. If you still can’t open the image in Painter, try opening the image in another application and resizing the file. Reducing the resolution without constraining the file size will decrease the number of pixels in the image. This will significantly lower the amount of memory the file will need to open.

*Painter Tip: After a long session working in Painter, the Painter temp file may be storing unnecessary data. Exit and relaunch Painter to create a new temp file.*

***Hmm, when I scanned the image it said it was only 200K but when I try to open it in Painter it says it will be almost 5MB.***

The file was most likely scanned as a 1-bit black and white line drawing or halftone. Painter is a 24-bit full color program which will read those files as 24-bit images. Instead of a single "bit" of memory, each pixel will now require 24 bits, increasing the file size 24 times! If you like, rescan the image as full color 24-bit or 8-bit gray scale to get a more accurate estimation of the amount of memory the file will require in Painter. (Note: If scanning in gray scale [8-bit], the image size will "grow" about three times when opened in Painter.)

***I received an error message in Painter that said there was a General Protection Fault or an Application Error.***

Please refer to the *General Protection Fault (GPF) Errors* section of this document for information about GPF's.

**Still Confused?** If you need some more basic information on memory and disk space, check out the *Memory (and More) Made Easy* section of this document.

# 4. Troubleshooting Windows Video Card Problems

This section summarizes some general problems and solutions related to Painter for Windows and various video cards. Contents of this section include:

- **"Painter requires a 256-color display driver" error message.**
- **"Unknown byte swap" error message.**
- **Color squares, slider bars, or other areas appear only black or are blank.**

### *1. Error message: "Painter requires a 256-color display driver".*

If you try to start the program and you receive an error message similar to this one, your current Windows display driver only supports 16 colors. Painter requires at least 256 colors available in order to run. Change your Windows display driver to one that supports more colors. If you are uncertain about how to do this, use the following checklist. If at any point in this process you are uncertain or stuck, consult your video card or computer system documentation, or contact the video card manufacturer for assistance:

A. **Confirm the hardware**. Check that your video card itself supports at least 256 colors in Windows. Nearly all video cards sold in recent years do. Any card identified as "SuperVGA" or better should be fine. If you suspect that your card may only supply 16 colors in Windows, consult your video card documentation or manufacturer for more information. If your card does not support more than 16 colors in Windows, you will need to use another video card to run Painter.

B. **Confirm the current driver**. Check to see what video driver you are currently using.

**Windows 95:**

To change display card resolution under Windows 95, click on the Start Button and select the Control Panel under the Settings menu. Double-click the *Display* icon, and click on the Settings tab. Change the color palette to 256 colors or more. Painter works best in 16-bit (32,000 colors) or 24-bit (16 million colors) color environments.

**Windows 3.x:**

Check your display setting in one of two ways:

Manufacturer's utility program. Some video card manufacturers supply handy utility programs which allow you to easily view your current resolution and change to others. For example, ATI provides the FlexDesk utility, which is an icon in Program Manager. Diamond cards have a Diamond icon in the Windows Control Panel. If your card provides such a utility, you can use it to view the resolutions available to you and change to a suitable resolution and number of colors. If this is the case, you can also skip the rest of this section.

Windows 3.1 Setup. If you don't have a manufacturer's utility to change resolutions, you can use the Windows Setup program. This is an icon normally in the Main group in Program Manager. Double-click on the icon to bring up the Setup window. Under the section marked "Display," you will see your current Windows video driver listed. If this driver is listed as "VGA," you are using the generic Microsoft VGA driver, which supports only 16 colors.

C. **Change the driver**.

**Windows 95:**

To change the display driver under Windows 95, click on the Start Button and select the Control Panel under the Settings menu. Double-click the *Display* icon, and click on the Settings tab. Under *Change Display Type* check/select the appropriate display adapter.

**Windows 3.x:**

To change video drivers in Windows Setup, click on the Options menu and choose Change System Settings. You will now be able click on the Display section and scroll through the list of drivers available on your system. *IMPORTANT: Most of the drivers you will see in this list are shipped with Windows, and are probably incompatible with your video card.* What you are looking for are drivers specifically identified for your video card. Therefore, you need to be clear on what brand and model of card you have before you make any changes in Windows Setup.

Once you are sure of what kind of card you have, scroll through the list of drivers and click one that matches your card and supplies at least 256 colors. Windows drivers are

often identified by notation similar to “800x600x256,” which means a resolution of 800 by 600 pixels with 256 colors. After choosing a driver, click on OK to continue. At this point, Setup may prompt you with the message “A driver for this display is already on the system...” If you see this message, click on the “Current” button to continue. Now hit the “Restart Windows” button. Windows will restart in your new resolution.

NOTE: If Windows fails to restart or comes up with a black screen, you have probably chosen an incompatible video driver. To fix this, run the DOS version of Setup from the DOS prompt by typing “c:\windows\setup”. This will allow you to go back and choose your old driver. Once done, you should be able to reenter Windows.

If you were not able to locate the correct driver for your card within Windows Setup, the drivers for your card have not been installed on your hard disk. They should be located on a disk that shipped with the card or with the computer system. Follow the manufacturer’s directions for installing the drivers. If you cannot find the drivers or are uncertain how to install them, contact your video card or computer system manufacturer.

It is also possible that you can use the generic Microsoft SuperVGA drivers, which ship with Windows for Workgroups. These drivers supply at least 256 colors, and should work with some video cards. If you don’t have Windows for Workgroups, you can obtain a copy of the SuperVGA drivers from Microsoft directly or by downloading them from an online service.

### *2. Error message: “Unknown byte swap”.*

**Windows 3.x:**

If you receive one or more error messages when starting Painter that include the text “unknown byte swap,” you may have a Cirrus Logic video card without the most recent drivers. Cirrus Logic supplies video chips to many different video card manufacturers. Cirrus Logic video drivers earlier than version 1.41 may cause this problem.

If you are unsure if your card uses Cirrus Logic chips, run Windows Setup as described in the previous section. Under the Display field, you will see your current video driver listed. If the driver name includes the text “Cirrus Logic” or the initials “CL,” you have a card that uses Cirrus Logic

chips. If this is the case and the driver is earlier than version 1.41, contact Cirrus Logic or your video card manufacturer for the latest drivers. You can contact Cirrus Logic directly at the numbers below:

| | |
|---|---|
| Main number: | (510) 623-8300 |
| Bulletin board (to download drivers): | (510) 440-9080 |

If you choose the download the drivers, look for the full set of Windows 3.1 drivers. They will probably be identified as either CL-GD5422/24 or CL-GD5426/28.

Even if your current driver doesn't say "Cirrus Logic" or "CL," you may still have a Cirrus Logic card. Contact your video card or computer system manufacturer to confirm what chip your card uses.

Once you have the latest drivers installed, Painter should launch correctly.

### *3. Color squares, slider bars, or other areas appear only black or are blank.*

If Painter's Color Set squares or other sliders or boxes appear all black or are missing, this is probably due to an incompatibility with your current video driver. Try changing resolutions (as outlined above) or the number of colors (for example, temporarily change from 16 million colors to 256 colors). Usually you will find that the problem is present only with certain resolutions.

If this is the case, you have two options. The first is to simply use Painter in the resolution and number of colors that works correctly. The second is to contact your video card manufacturer to make sure you have the most up-to-date drivers. If there are more recent drivers available, they may partially or completely clear up the problem.

**Windows 95:**

Under Windows 95, these problems sometimes can be addressed by turning off graphics acceleration. To do so, click on the Start Button and select the Control Panel under the Settings menu. Double-click the *System* icon, and click on the Performance tab. Under *Graphics,* change the Hardware acceleration slider value to "none."

# 5. General Protection Fault (GPF) Errors

If you are encountering random General Protection Fault or Application Error crashes while working in Painter, there are several possible causes. This section includes:

1. **A conflict with your current video driver.**
2. **A conflict with other software or drivers on your system.**
3. **Corrupted files, either in the Painter directory or in the Windows directory.**
4. **Images that are too large for your system configuration.**
5. **Reporting a GPF..**

Because GPF's are notoriously difficult to troubleshoot, you may need to test more than one of these possibilities. Basic information on each appears below.

**Windows 3.x:**

***Note:*** *If any Windows program, including Painter, crashes with a GPF and you are able to return to Program Manager, restart Windows before continuing. Crashing programs often leave Windows resources allocated, which can cause serious problems later. Restarting Windows resets these resources.*

### *1. Video driver conflicts.*

In certain cases, Painter may experience a conflict with your current Windows display driver. To test for this possibility, change resolutions in Windows. This will change the current video driver, allowing you to determine if the problem is video-related. Don't forget that Painter requires at least 256 colors to run. Use Painter for a while in the different resolutions available to you with your video card, and see if the GPF's repeat. If the GPF's repeat more in certain resolutions, the problem is probably related to a video driver conflict. Either use Painter in the "safe" resolutions, or contact your video card manufacturer for updated video drivers, if available.

If you are unsure how to change resolutions in Windows, consult *Troubleshooting Windows Video Card Problems* in this document. Also refer to this chapter if you have a video card that uses Cirrus Logic chips and starting Painter results in crashes with the message "Unknown Byte Swap."

### *2. Other software or driver conflicts.*

If the GPF's seem to be unaffected by the resolution, they may be caused by a conflict with something else on your system. This could be a another device driver (like a sound driver), or other software that stays resident in memory as you work (like a virus checker). To test this, try "clean-booting" your system with a minimal configuration. Basically, this means loading only the items absolutely necessary to the system, temporarily bypassing optional items like sound drivers and virus checkers. There are several ways to clean-boot your system:

**Windows 95:**

Normally, the best way to clean-boot Windows 95 is to restart the computer in "Safe Mode." However, this troubleshooting mode will not allow you to run Painter, because it only provides 16 colors (Painter requires a minimum of 256 colors). In most cases, however, clean-booting Windows 95 is not necessary.

**Windows 3.x:**

**Clean boot with the F8 key (DOS 6.2 or higher).** Reboot your computer and wait for the startup message that reads "Starting MS-DOS." When you see this message, hit the F8 key on your keyboard. This will allow you to step through your CONFIG.SYS and AUTOEXEC.BAT files one line at a time, answering "Y" or "N" to each line. If you answer "N" for a line, that line will be skipped. Go through all the lines in this manner, answering "Y" only to those lines absolutely necessary for DOS and Windows. The following is a list of software that you should allow to load for Windows to run correctly:

CONFIG.SYS:
device=c:\dos\himem.sys

AUTOEXEC.BAT:
prompt &p&g
path=c:\; c:\dos; c:\windows...etc.
c:\dos\smartdrv.exe

*NOTE: If you are running with Doublespace, Stacker, other disk compression, or a SCSI hard drive, answer "Y" to the appropriate drivers.*

This method makes no permanent changes to your system. If you reboot again without hitting F8, everything will load normally.

**Clean-boot with a bootable floppy disk.** If you have DOS 6.0 or earlier, use a bootable floppy. Create one from the DOS prompt using the FORMAT A: /S command, which will format a floppy disk and make it bootable (this means that if you start your computer with this disk in the A: drive, DOS will load from the floppy instead of the hard disk). Now, copy your CONFIG.SYS and AUTOEXEC.BAT files to the floppy. Edit both files so they contain only the lines mentioned above. Restart the computer with the floppy in drive A: to clean-boot.

Once you've clean-booted your system, enter Windows 3.x and make sure no other software is running in the background. Hold down both [CTRL] and [ESC] simultaneously on your keyboard to bring up the Windows Task List, which shows currently running programs. If anything other than Program Manager is listed, highlight it and click "End Task" to shut down the program. When only Program Manager is running, start Painter.

Use Painter for a while in this minimum configuration. If the GPF problem goes away or becomes less frequent, the conflict is probably related to software on the system. Narrow down which item is involved in the conflict by adding drivers back into the boot process one by one, using either of the methods described above.

### *3. Corrupted files.*

Sometimes files in the Painter directory can become corrupted, leading to GPF's or other problems. Reinstalling Painter will refresh these files. If you reinstall Painter, remember that any custom brushes, selections, or floaters that have been saved into the default libraries (like PAINTER.BRS, the default brush library) will be lost as these files are overwritten. If you have items like these that you wish to keep, make sure they are saved into custom libraries. For example, custom brushes saved into a library named MYBRUSH.BRS will be safe during reinstallation. To move items between libraries, use the Brush Mover (or one of the other Movers) within the program. See the Painter 4 User Guide for details.

**Windows 3.x:**

In rare cases, problems with the Windows system files can lead to GPF's in Painter. If you suspect this is the case, consider reinstalling a new copy of Windows into a different location on your hard drive. You can run Painter from within this "fresh" copy of Windows to determine if the problem is related to the Windows files themselves.

### *4. Images too large for your system.*

In some cases, trying to work on large files using a system without enough RAM or hard disk space can lead to random crashes. If this may be the case, try repeating your steps using a smaller image. You can maximize the amount of free space that Painter has available by following the steps in *Tips on Windows Memory Management* in this document.

### *5. Reporting a GPF*

At Fractal Design we work hard to make our products robust and crash-free. However, the number of different PC system, video card and software manufacturers makes it impossible to test every combination of hardware and software with Painter. If you discover problems with Painter with the particular configuration of hardware and software that you use, please help us to make future versions of Painter even better by reporting your problems to Fractal Design. In order to fix problems, we must be able to reproduce them. So, please try and figure-out the steps necessary to re-create the problem.

If you can reproduce the problem with a specific set of steps, please contact Fractal Design Technical Support at 408 688-8800, and let us know what those steps are. If you cannot reproduce the problem, you may be experiencing Windows resource allocation problems. Consult the *Tips on Windows Memory Management* chapter for details.

Windows 95 makes it a little easier to trace the source of GPF errors. If a GPF occure, click on the Windows 95 *Details* button and write down the first 2 lines of the error message. Please report this text when you phone-in your error.

# 6. Memory (and More) Made Easy

Stumped by RAM and other infamous memory-related muddles? Don't worry - here's a short and simple introduction to the intricate and sometimes mysterious workings of your computer's memory system. This section is strictly for users new to computers or to the concept of virtual memory.

**RAM.** Memory, or RAM, is the computer's workspace. It is much like the surface of a desk - the larger the desk, the more information that can be randomly accessed from the desk. Say, for example, there are ten stacks of papers on the desk. One stack may be art files, another may be bills, another a bunch of crossword puzzles, etc. Any one of those stacks can be worked on in any order. Play with bills for twenty minutes then switch to puzzles for a half hour; it doesn't matter.

**The operating system.** The catch, however, is that with a PC they've taken your chair. You have to sit on the desk. You are the Operating System (DOS / Windows). Then the maximum number of stacks that can be on the desk becomes the size of the desk minus you. If you have too many stacks, you wind up working underneath your own feet and you fall off the desk (otherwise known as a crash).

**The hard drive.** Okay, so now you've run out of room for all your stacks. The best thing to do (aside from just chucking everything but the games) would be to file them. You reach down, open up the drawer and place the files into the drawer using your own special filing system. This is your Hard Drive. The hard drive contains all the data, but is too cumbersome to actually work with while the files are still in there. Take a stack out of the drawer, work with it for a while, then put it back. Take another out, etc.

**The application.** But now to make matters worse, they've also taken your mind. (Oh, if only the excuse were that simple…) At this point you have to take out an instruction book to work on each of these stacks. This is the Application (Painter, Word, SimCity 2000). In order to accomplish your task, you have to skim through the book to find out how to do what you want, and the book will tell you where to go to find out how to do it. Sometimes these books can become quite large, and remember, they too have to be able to fit on the desktop.

**The temp file.** But what if you want to do some painting and your canvas is bigger than the space available on the desk? Easy: Painter's book has instructions for tearing off chunks of canvas,

working with them on the desk and then recombining them back in the file drawer. And even more clever - it tells you how to create a special file at the front of your file drawer so you can access your canvas much quicker. This is Painter's Temp file, called PAINTER.TMP. The temp file is also sometimes referred to as private Virtual Memory. It catches everything that would normally "spill over" off the edge of the desk.

Then when you are done painting, you put away the file, close and put away the book, and you are ready to get back to SimCity.

**To sum this all up a bit:**

**RAM or memory is the total amount of workspace available.** Physically, RAM is just a set of computer chips inside the computer. Memory is commonly measured in megabytes (MB), with 1 megabyte equal to 1000 kilobytes (k). Common PC configurations are 4, 8, 12, 16, 24, and 32 megabytes of RAM.

**The operating system takes up RAM.** DOS itself reserves about 1 megabyte of RAM. Windows usually takes a couple more (and Windows 95—even more!), depending on factors like how many fonts and drivers you have loaded. Smartdrive, a disk cache used with Windows 3.1, takes up some memory too. After adding all this up, the remaining memory can be used for applications and documents.

**The operating system gets instructions from applications that also use RAM.** You can control how much RAM Painter will use by choosing Half Memory for Painter or Maximum Memory for Painter in the program's Preferences section. See the *Tips on Windows Memory Management* section of this document for details.

**The hard drive stores all the applications and data files until they are loaded into memory.** Hard drive capacity is usually measured in megabytes, although sometimes in gigabytes (GB). One gigabyte equals 1000 MB. Hard drives are slow compared to RAM. This is why we typically try to have as much data in RAM as possible.

**When applications don't have enough RAM, they sometimes move data onto the hard disk temporarily.** This is virtual memory. Windows has its own system-wide virtual memory scheme, sometimes called the Windows swap file. Painter bypasses this swap file and, if necessary, creates its own swap file on the hard drive (the PAINTER.TMP file). This

file will grow as large as necessary during a Painter session to hold the images you are working with.  The temp file is deleted when you exit the program.

# 7. Cloning Tips and Techniques

Cloning is one of Painter's most powerful and flexible features, allowing for a huge range of creative possibilities. Getting comfortable with using the cloning features can take time and a lot of experimentation, but will also bring many rewards. The most important thing to remember when cloning is that although you can automate parts of the cloning process, you'll still probably need to do some things "manually." Painter's cloning features are not intended to work like a plug-in filter, where you hit one button to apply the effect. Cloning works better the more creative input you put into it!

This chapter contains the following sections:

- **So what is it, anyway?**
- **How does it work?**
- **Creating a clone image.**
- **Painting into the clone.**
- **Customizing your cloning brushes.**
- **Automating the cloning process.**
- **Other ways to set up a source/clone relationship.**
- **Understanding source/clone mapping.**

**So what is it, anyway?** In its basic form, cloning allows you to recreate an image in another artistic medium. For example, you can take a photograph of a parrot and change it into something resembling a chalk drawing of a parrot. Or an oil painting. Or a watercolor. Cloning will also enable you to borrow "pieces" of one image and paint them into another image, without having to cut and paste.

**How does it work?** Cloning sets up a relationship between two separate images, called the source and the clone. The *source* image is the original artwork or photograph that you want to use or modify. The *clone* image is where you actually paint or draw to create your new, modified picture. Both the source and the clone are complete, full-fledged images, and both can be saved to disk like any image. *As you paint or draw into the clone, you "borrow" color information from the source.*

To accomplish this, you need three things: the source document, the clone document, and a "cloning brush."

A cloning brush is any brush that takes advantage of the source/clone relationship. You paint with your cloning brush into the clone image. The color of your cloning brush is not determined by the color chosen in the Color palette, as is the case with other brushes. Instead, your cloning brush uses the color found in a corresponding area of your source image. By "borrowing" the color from the source, you can recreate the likeness of your source image in myriad ways. Although you don't need to touch or modify your source image in any way for cloning to work, it must remain open as you clone.

**Creating a clone image.** The first step in cloning is setting up the source/clone relationship. The easiest way to do this is to first open the image you wish to copy, modify, or recreate (the source) and then select "Clone" under the File menu. This automatically does two things: 1) it creates a new image, identical to the source image; and 2) it establishes a source/clone relationship between the two. This relationship exists as long as both images are open during this Painter session. Closing one or both images will break the source/clone bond.

> **Hint: Erase the clone image first.** The File: Clone command creates an identical copy of your source image in the clone document. If you now paint over this image with a cloning brush, it will of course appear that brushstrokes have been placed on top of an existing image. This is perfectly acceptable, but not at all required. In fact, we often recommend that you *delete* everything from the clone image before you start laying down brushstrokes. The easiest way to do this is to hit [Command-A] and then [Delete] on a Mac keyboard, or [CTRL-A] and then [Backspace] on a PC keyboard. This will erase the image in the clone document, leaving you a clean, blank canvas for your masterpiece-to-be.
>
> One reason you may choose to do this is when you want a blank paper color to show through the gaps in your strokes, like when using the Chalk Cloner to get the look of a pastel drawing. If you're using an Oil-type Cloner, however, you might want to leave the original picture underneath your strokes, to provide "fill-in detail" where the strokes don't overlap. Think of the difference in this way: the first method is like drawing with chalk on a blank canvas, while the second method is like creating the same drawing with chalk *on top of* a photograph. It all depends on the look you eventually want. Try it both ways and see for yourself!

**Painting into the clone.** Now we're ready to start cloning! Simply pick a Cloner brush from the Brushes palette and start painting into the clone image. You will start to see colors from the source image "come through" into your brushstrokes. In general, the more you paint into the clone image, the more you'll see of your original source image. However, depending on the cloner variant you've chosen, you will see one of two very different effects take place:

**"Single" cloner brushes.** In the Brushes palette, choose "Spacing" from the Controls menu. You'll see that brushstrokes can be defined as Single, Multi, Rake, or Hose. How your cloner behaves depends, in part, on these settings. The simplest type of cloning brush uses the "Single" setting. This type of brush includes the Pencil Sketch Cloner, Felt Pen Cloner, Chalk Cloner, Melt Cloner, Driving Rain Cloner, Soft Cloner, and Straight Cloner. When you use a "Single"-type cloning brush, *the color will vary throughout the stroke* as you pass over different areas of the source. For example, say that you were cloning a photo of a sailboat. If you took the Chalk Cloner and scribbled one long, single stroke over the whole image, the color of the brush would change mid-stroke to match the underlying photo's colors: the blue of the sky, green of the ocean, and the white of the sails. You could reproduce the image of the sailboat with a single, long, scribbly brushstroke, if you liked. Think of the sailboat photo hung behind a very dusty pane of glass. The "single" cloning brushes would be like wiping away the dust on the glass, revealing the image underneath.

**"Multi" or "Rake" cloner brushes.** Cloners built on the "Multi" type include the Hairy Cloner, Oil Brush Cloner, Hard Oil Cloner, and Van Gogh Cloner. These brushes use multiple bristles, hence their name. When you use a "Multi" or "Rake"-type cloner, *the color will not vary throughout the stroke* as you pass over the image. Using our sailboat example, say that you started a Hairy Cloner stroke on an area of your image that matched an area of sky. Your stroke would come out some shade of sky-blue. However, as you continued the same stroke over the image, your stroke would remain sky-blue. If you scribbled one such stroke back and forth over your image, all you'd get would be one long of scribble of a single color. Because of this, these cloning brushes are usually used *in short strokes or dabs*. As you build up many short dabs into the image, each dab reflects a different color from the source. When you've put in enough dabs, your original image begins to become apparent. Think of this like glopping dabs of paint onto the dusty glass on top of the sailboat photo. Each small bit of paint matches the color behind it. With enough glops, you'll see the shape of your sailboat emerge.

Try out both types of cloning brush so you can see firsthand this fundamental difference. You can even change a "Single" brush to a "Multi," or vice-versa, by simply clicking on the buttons in the Brush Controls : Spacing palette.

**So, besides "Single" and "Multi," what's the difference between the different cloning variants?** Even though the Pencil Sketch Cloner and the Driving Rain Cloner are both "Single"-type brushes, they create very different-looking brushstrokes. This is the magic of cloning in Painter: these brushes don't reproduce the source image *exactly*. Instead, they introduce variations, based on the size of the stroke, shape of the "dabs" that comprise the stroke, and what kind of variant it is. The Pencil Sketch Cloner creates a very thin, solid line, while the Driving Rain Cloner produces a wider, softer stroke with separate, rain-like dabs. All of the Cloners are designed to give you a different type of cloning "look." The only cloning brushes that recreate the source image *exactly* are the Straight and the Soft Cloners.

> **Hint: use the Straight or Soft Cloner to restore detail.** The Straight and the Soft Cloners are very handy. While cloning an image, you may often find that much of the fine detail of the original image is lost. This is due to the variations that the cloning brushes intentionally introduce. If you need to recover more fine detail for a particular area of your image, use the Straight or Soft Cloners. Setting the Opacity (in the Controls palette) of these brushes to a low setting will allow you to brush in a faint layer of "exact" detail from the source image. The more you use these cloners in an area of your image, the more the original image will show through. Setting the Opacity to a low value is important - otherwise, the Straight or Soft Cloner will splash in the original image at full opacity, eliminating any attempt at subtlety! The only difference between these two brushes is the Straight Cloner has hard edges, while the Soft Cloner has soft, faded edges.
>
> **Hint: Tracing Paper.** Are you lost while painting into your clone? Can't tell "where you are" in the source image? Use Tracing Paper. At any point after using File: Clone, you can hit the Tracing Paper icon in the upper right corner of the image window (or press [Command-T] on a Mac or [CTRL-T] on a PC). You'll see a faded version of your source image appear in your clone (if you haven't deleted the original image out of the clone as described above, you won't see much happen). As with real tracing paper, you can use this feature to see exactly where your brush is in relation to the source image. Toggle Tracing Paper off again to see your image by itself. You don't even have to use a cloning brush while using Tracing Paper - all it requires is that you have a source/clone relationship between two images. In fact, many people scan in a sketch they've done on real paper, clone it, and then

use Tracing Paper to see the sketch as a reference for their brushstrokes - all without cloning at all.

**Customizing your cloning brushes.** The fact that the Cloners are normal brushes like any other brush in the program means they can be customized like any other brush. Modifying the default Cloners will greatly increase the number of "looks" you can produce with cloning. The best way to figure out how to customize a brush is to experiment with the many settings Painter allows you to change. Here is a partial list of the aspects of a brush that can be modified in Painter 4:

| Brush Attribute | Description | Palette location |
|---|---|---|
| **Size** | Stroke size | Brushes palette: Controls menu: Size |
| **Opacity** | Stroke transparency | Controls palette |
| **Grain** | Amount of texture in stroke (for brushes with "grainy" method) | Controls palette |
| **Paper Texture** | Type of texture in stroke (for brushes with "grainy" method) | Art Materials: Papers palette |
| **Squeeze** | Roundness of brush shape | Brushes palette: Controls menu: Size |
| **Angle** | Rotates the brush shape | Brushes palette: Controls menu: Size |
| **Captured** | Chooses a captured brush shape | Brushes palette: Controls menu: Size |
| **Single/Multi/Rake** | Chooses single or compound brush | Brushes palette: Controls menu: Spacing |
| **Method** | Defines the behavior of the brush | Brushes palette |

Don't be overwhelmed by the number of combinations available in Painter. Simply experiment to see what they do. The best way to experiment is to use the Brush Look Designer.

**Hint: the Brush Look Designer.** (Brushes palette: Brushes menu) This utility is an extremely valuable way to experiment with making changes to your brush. The Brush Look Designer shows you a real-time preview of your brushstroke as it is currently configured. For example, say you want to try changing a brush's Method, but you're not sure what all the different Methods mean. Just try out a different Method and you'll see your stroke change instantly in the Designer window. Experiment with all the attributes listed above and see how they affect the stroke. The Brush Look Designer works equally well for cloning and non-cloning brushes. You'll find the Brush Look Designer in the Brushes palette under the Brushes menu.

**Hint: changing a regular brush to a cloner.** Can't find the cloning brush you want from the list of default Cloner variants? Try turning a regular brush into a cloner! Just choose the brush you want to use, then click the "Use Clone Color" checkbox in Art Materials : Colors. Again, you can use the Brush Look Designer to preview your stroke. Say you want to recreate a photo in watercolors. Since there is no default Cloner variant provided that does this, choose one of the Watercolor brushes, turn "Use Clone Color" on, turn on the Wet Layer, and begin cloning.

**Automating the cloning process.** The most direct way to clone an image in Painter is to paint strokes manually using a cloning brush and the techniques described above. However, Painter does provide several ways to automate brushstrokes, and these shortcuts can easily be used with cloning.

The first is **Auto Clone** (found under Effects: Esoterica), which automatically applies random dabs of paint over your image (or a selected area) using the current brush variant. The dabs are applied over the image in wave after wave, eventually filling up the image if you let it run long enough. Stop the process at any time by clicking once in the image window. This is an easy way to quickly fill an image with cloned color. If the final result doesn't show enough detail from the original image, reduce the brush dab size (Brushes palette: Controls menu: Size) and start Auto Clone again. The smaller dabs will allow more detail to show through.

The advantage of Auto Clone is that it quickly fills an area with cloned color. The disadvantage is that Auto Clone only uses dabs of paint, not brushstrokes. It's as if you're just hitting the tip of a brush against your canvas. To automatically play back *brushstrokes*, you need to use the Record Stroke feature.

**Record Stroke** (Brushes palette: Stroke menu:) allows you to record a single brushstroke and play it back, either a single stroke at a time, or automatically in random places on your image. You could, for example, record a long, diagonal stroke. Using the "Auto Playback" feature, Painter would then randomly apply this stroke over your image using the brush of your choice. The final effect is similar to Auto Clone, except you're using brushstrokes instead of brush dabs. Like Auto Clone, Record Stroke will utilize any brush you have chosen in the Brushes Palette - cloner or not. Consult the Painter User Guide for details about using Record Stroke.

**Other ways to set up a source/clone relationship.** Using File: Clone isn't the only way to set up a source/clone relationship. What if you want to clone part of one existing image into another existing image? One answer is to use the "Clone Source" option in the File menu. Open both images as you would normally. Now, select File: Clone Source. In the submenu, you will see the names of both images listed. Select the image you want to be the source, and that's that. All you have to do now is move to the "clone" image and start working. The name of the your current source image always has a checkmark next to it under File: Clone Source.

**Understanding source/clone mapping.** The source/clone relationship we've been talking about is really a way of "mapping" one area of an image to another area. Normally with a source and a clone image, the upper left corner of the source is mapped to the upper left corner of the clone. But what if you want to modify this mapping? Say, for instance, that you want to paint into the upper left corner of your clone image, but you want to clone a flower found in the lower right corner of the source. You can change the mapping using the following method:

Make sure you have the Brush icon chosen in the Tools palette, and switch to your source image. Holding down the Shift key on your PC keyboard, or the Control key on your Mac, your brush cursor will change to a crosshair cursor. Now click in the source image where you want the mapping "origin" to be. In our example, you'd click on or near the flower in the lower right of the source. Now, return to the clone and start painting with a cloning brush in the upper left. The flower will begin to appear at the point where your first cloning stroke begins. Try it!

If both the source and clone images are visible on-screen at the same time, you'll see a crosshair move around in the source as you paint with your cloner brush. This crosshair shows what part of the source you are currently working with. If you don't see the crosshair, select "Indicate clone source with cross hairs while cloning" under Edit: Preferences: General.

> **Hint: cloning within a single image.** Using this method, you can clone part of one image onto another part of the same image. Just Shift-click (PC) or Control-click (Mac) on the "source area" you want to use, and paint somewhere else in the image using a cloning brush. This technique is very handy if you want to duplicate a texture or pattern in multiple places in the same picture. It's also useful if you need to "borrow" a piece of an image and replicate it somewhere else. As explained in the previous paragraph, you'll see a crosshair move around as you paint. This crosshair marks the area that's currently acting as your clone source.

**Conclusion.** Hopefully, this chapter has gotten you started in power-cloning! Remember to consult the Painter 4 User Guide for basic information on all these techniques, and the Painter 4 Tutorial for more help with cloning.

# 8. Desktop Color Publishing for Beginners

The following summary is designed to inform you about areas of desktop publishing you may be unfamiliar with. It is intended to provide you with helpful hints and information, and to point you in the right direction for seeking out sources that can further your expertise in desktop publishing.

This chapter includes information on:

- **Printing**
- **Resolution and File Size**
- **Tips for Managing Large Files**
- **Desktop Color**
- **Color Matching: from Monitor to Print**
- **Suggested Reading**
- **Other Information**

## Printing

**Halftone dot vs. pixels per inch (ppi).** If you look closely at most printed images, you'll see a dot pattern. This is referred to as a *halftone dot* or *halftone screen*. Continuous tone images (original photographs, for instance) must be reproduced this way for offset printing. In gray scale printing (newspapers), the varying dot sizes suggest different shades of gray. In process color printing (cyan, magenta, yellow, and black), varying dot sizes and screen angles give the illusion of millions of colors!

The spacing between halftone dots is referred to as *lines per inch* or *lpi.* The paper porosity and the type of press determines what the halftone dot (lpi) will be. Newspapers (very porous paper) usually print at 85 lpi, while a high-quality magazine (not very porous, coated paper) will print at 150 lpi.

Pixels per inch (ppi), also known as dots per inch (dpi), relates to the pixelization you can often see on your computer screen. Fewer pixels per inch create a more jagged-looking image. More pixels per inch create a smoother-looking image.

### *What do halftone dots and pixels per inch have to do with each other?*

If you don't have enough pixels per inch for the halftone dot requirement, your image may look quite pixelated. On the other hand, you don't want to have too many pixels per inch because your file size will become enormous!

### *How do I know how many pixels per inch to use to get the best results?*

The first thing you'll need to consider is what your final output will be. You don't want to consider your laser printed proof as final output. If you're going to go to an offset printer, you'll need to check with your printer for the suggested lpi for the job. *The general rule of thumb is 1 1/2 to 2 times the lpi for the ppi.* For example: If the halftone screen will be 150, your ppi should be 225 to 300.

If you're using a service bureau to print a color copy, an Iris print, or print using another high-end color printer, you'll want to consult with your service bureau for the suggested ppi. *Note that this is ppi.* Many high-end color printers don't use halftone dots but print continuous tones instead.

## Resolution and File Size

Basically, pixels equal memory. The more pixels (the higher the ppi) and the larger your physical image size is, the more memory the image will need.

### *How much memory do I need?*

Painter needs three to five times the working file size, in a combination of RAM and/or hard disk space. (This estimate increases if you have more than 1 Undo level set up in Edit: Preferences:

Undo.) When viewing your image in the File: Open dialog, look at the image memory size under the thumbnail. This is the working file size and, as you may have noticed, can be much larger than the stored (often compressed) size that you see when viewing the file size in the Windows 95 Explorer, the Windows 3.x File Manager, or DOS. For more information, see the *Tips on Windows Memory Management* chapter of this document.

An 8 1/2" x 11" file at 300 ppi (offset print quality) is a 30 MB working size file. You will need three to five times that amount available: 90 to 150 MB. As you can see, bitmapped graphics take up huge amounts of space, so be aware of what you require and don't make your image larger than is necessary for your output requirements.

## Tips for Managing Large Files

Working at the file's final size is always best, but if a lack of memory or the application's speed is bogging you down, here are some ideas:

**Resampling an image.** Start by working at the largest file size that your system will comfortably handle. (Remember to account for Painter's temp file.) When you've completed your image, resample the image to the final output size. Resampling an image is adding the "missing" pixels back in. To do this, choose Canvas: Resize. Deselect the "Constrain File Size" checkbox, and input your new resolution. Click OK. The resampling can result in a loss of sharpness. This is due to Painter having to guess what color the added pixels should be, and making gradations between the existing ones. If the softness is too noticeable, try using Painter's sharpening filters. Also, keep in mind that you will need to have the space available to create the final image. Therefore, you will either have to make space available on your hard drive, or do the resampling process on a computer that has the available memory.

**Tip:** Often times you can work at half resolution and resample when you are almost done. Sharpening your image will bring back lost detail, then apply finishing touches (brush strokes, surface texture, etc.).

**Hint:** If you're considering this method, try resampling just a small section of the image to discern final results. To do this, use Painter's marquee tool to select a smaller portion of the image. Choose

Edit: Copy, then, Edit: Paste: Into New Image. Use this image for your resizing and sharpening tests.

**Record a script and play it back at a higher resolution.** This technique also requires that you have the memory available for the final image. However, unlike resampling, this method retains the integrity of your original brushstrokes and effects. Refer to the Painter 4 User Guide *Chapter 14, Scripting* for details.

## Desktop Color

**A brief history.** In the beginning, there was Desktop Publishing. Experts and novices alike could create printed brochures, flyers, business stationery, etc. all on the computer - and all by themselves. Traditional typesetters were shaking in their boots as the need for their services dwindled. As the dust settled, and the professional quality (or lack thereof, as was the case) of printed materials became apparent (or non-apparent, in this case), desktop publishers found themselves having to learn the skills of proper typography and good graphic design to compete. And, fortunately, many typesetters (who could read between the lines) jumped on the desktop publishing bandwagon.

As new technology introduced separating graphic designs to film, the Desktop Publisher-Typesetter had to become Desktop Publisher-Typesetter-Printer. Many disgruntled printers were now having to deal with "desktop publishers" who knew little, if anything, about creating film. This was, after all, traditionally produced in-house using cameras and darkrooms… That's when the printers (who could read between the lines) brought desktop technology in-house. Thankfully for everyone, new classes taught how to use these new professional tools to properly produce design for offset printing.

Now, if you thought learning good graphic design and typography was an accomplishment and understanding the production of film from a printer's point of view was a stretch ... in comes Desktop Color Separation. Just when he or she thought they were practicing safe-graphic design, the Desktop Publisher-Designer-Typesetter-Printer must now add Separator to the list of skills needed to produce graphic design in this new, highly competitive market.

This topic could warrant a whole book in itself (in fact, we've mentioned a couple at the end of this chapter). But in all seriousness, color publishing on the desktop *can* achieve impressive, affordable

results, and provide you with the full control of color. The following is only a broad overview of desktop color. For more detail, you should do further reading and experimentation.

**Process Color**. Magazines are a good example of process color printing that you see almost every day. The combination of four colors: Cyan, Magenta, Yellow, and Black (CMYK) make up just about every color you need! This is also the most affordable process for reproducing colorful images and photographs. For more information on creating process color separations in Painter, refer to the chapter *Printing* in your User Guide.

**Spot Color**. Printing with spot colors refers to printing with pre-mixed ink colors. The Pantone Matching System (PMS) is a color-matching system with which many people are familiar. Painter includes a Pantone Color Set for your use in screen-matching with Pantone colors (note this is *screen matching* only). Refer to the chapter *Applying Art Materials* in your User Guide for more information.

An advantage to using spot colors is the variety of specialty inks available. Metallic, fluorescent, and brightly-colored inks can add pizzazz to your design that cannot be created using process colors.

**Trapping**. Offset printing more than one color requires a separate pass for each color printed on the press. Unlike CMYK, which is a registered, overlapping print method, spot colors require trapping. Due to the slight slippage of the sheet of paper that can occur during printing, the different colors may not butt up to one another. Trapping is simply the consideration of how spot colors should be printed on top of one another so there are no blank spaces. For example, if you were printing a piece that had black and yellow inks touching each other, you would increase the size of the black element enough to overlap onto the yellow. This would create a buffer zone if the paper should slip it would not leave a blank space between the two colors.

## Color Matching: from Monitor to Print

Matching your monitor's colors to the printed piece (and vice versa) is the process of *calibration*. Calibrating your equipment to display and print the same can be a challenge. Here's the catch: your computer monitor displays in RGB (Red, Green, Blue). This technology of mixing colored light on your display is quite a different process than using transparent inks on paper. Therefore, display colors are difficult to match to process or spot colors. To add to this confusion, every program that

can convert a file to CMYK uses a different RGB to CMYK conversion table! Fortunately, when viewing spot colors you only need a close representation, because you specify the individual ink colors when you give the film to your printer.

Here are some tools that can help you with the process of calibration:

**Color Calibrators** are hardware devices that, once affixed to your screen, use software to balance the color and gamma (brightness and contrast) of your monitor. Radius is one company that makes color calibration devices.

**Calibration Software.** The purpose of this software is to adjust your monitor to reflect what your printed piece would look like. This is done with printer profiles that are either prepackaged with the program, or that you can create within the program. Some image-editing software packages, such as Adobe Photoshop, have these capabilities built in.

**Hint: Poor Man's Calibration.** For the not-so-serious color matching enthusiasts, this "backwards calibration" method is sometimes effective for matching monitors to personal color printers. Start with an image file and print to your color printer. The result may or may not be close to your monitor's representation. Using the contrast and brightness controls on your monitor, match the monitor image as closely as possible to the printed piece. If you have any software that can adjust the RGB values of your monitor, use them now to get an even closer match. Now, any new images you create will be in better sync with your printer.

Color calibration is a tricky endeavor. It is, however, a worthwhile pursuit if you want to have control of your color output. Familiarize yourself with the process and experiment to achieve desired results.

## Suggested reading

***Color Publishing on the Macintosh,*** by Kim and Sunny Baker
Random House Electronic Publishing, ISBN 0-679-73977-7
Includes a 3 1/2" Macintosh format disk. $45.00 (Canada $57.00)

***An Introduction to Digital Color Prepress, Volumes 1,2, & 3***

Available from Agfa Corporation at $10.00 each.
To order, call: (800) 395-7007.

## Other Information

**Service bureaus.** Your finished masterpieces can be output beautifully on high-end printers, ready for framing. Or, film can be produced for offset printing. Creating a relationship with a local service bureau can provide you with "a friend in the business." Have your service bureau show you samples from their various output devices. Let them assist you in determining your needs and showing how to prepare your work for the best results. Many service bureaus also work by mail or next-day delivery services. Look in your phone book under Desktop Publishing.

**User groups.** A great place to find someone who's already done it! Networking and working with others is the fastest way to increase your expertise. Consider hiring a fellow artist/designer to help you through a project from desktop to printer. Hands-on training is the best way to learn! Contact your local computer outlet for User Groups in your area, and specialty user groups (i.e. graphics groups).

**Classes.** Your local colleges may have many computer graphic-oriented classes to choose from. If they don't offer a Painter class yet - recommend it! Also, check with your local computer outlets. Many offer classes, and demonstrations too.

**Online Services.** Yet another great way to learn and find out more than you could ever need to know - about anything! Services such as CompuServe, America Online, e-World, and the Internet offer specific forums to ask questions, upload and download images, and find useful information. All you need is a modem and a subscription to a service. Many offer introductory deals for you to "test the waters."

CompuServe and America Online currently feature User Group forums on Fractal Design products. See the "How to Contact Fractal Design" document in the REFERENZ folder on the Painter 4 CD-ROM for details.

# 9. Hints for Buying a Graphics Tablet

The most popular tablets available for Macs and PCs are made by Wacom, CalComp, Hitachi, Mutoh (formally Kurta), Acecad, and Summagraphics. Each manufacturer has many different features, so it's best to choose a tablet based on your specific needs. The following is a list of considerations and features we've compiled from our own experiences with the many tablets now available.

**Pressure-sensitivity.** Fractal's products take advantage of this feature spectacularly! Paint strokes can be wider or more saturated depending upon the amount of pressure applied. Pressure can control brush size, opacity, texture, and color. Not all manufacturers and models are pressure-sensitive, so be sure of the type you're purchasing.

**Levels of pressure.** Available levels of pressure range between 120 to 256. Painter can utilize the highest level of pressure that is currently available. However, whether or not a high number of levels is perceivable in actual use is debatable.

**Tablet size.** Because a tablet of any size will take advantage of your full screen area, larger tablets offer more tablet drawing space per unit of screen real estate. In practical terms, this means drawing a line all the way across a full-screen image might take 8 inches of hand motion on a small tablet, but might take 12 inches of motion on a larger tablet. For some users, this offers greater detail, control, and freedom of movement. For others, it just means their arm gets tired sooner. Therefore, when picking a tablet size, consider not only the space on your desk, but also your personal painting and drawing style. For most non-professional users, tablets with a 6x8" or 6x9" active area offer a convenient compromise. Professionals artists may want to go for a 12x12" or larger tablet - but don't expect to hold these on your lap!

**Stylus/pen.** Variations include: pen attached to tablet with cord, cordless pens with batteries, and cordless pens with no batteries. We suggest that if you choose a tablet and pen combination that require batteries, always have extra batteries on hand in case they run out. Pens that require batteries are usually 'thicker' in the hand, and somewhat heavier. Also, some pens have programmable buttons on them. These can be useful, because you can set up a button to equal a double-click, for example.

**Tracing screens.** Some tablets have plastic overlays that allow you to slip something under to trace. This may not be a necessary option if you have access to a scanner.

**Programmable buttons on the tablet.** These can be useful for macros (i.e. open Art Materials Palette, Undo, etc.)

**Connectivity.** Some tablets connect through serial ports, others through Macintosh ADB ports. Keep in mind what ports you have available on your machine. Using a serial mouse and serial tablet requires two free serial ports!

**Tablet software.** There usually are some useful customization features within the software. For example, you can isolate a part of your tablet as a smaller working area that allows you to get around a large screen or tablet with less effort. Or, you can change the mapping to trace an image at a different size. When tablet and software arrive, call the manufacturer to ensure you have the most current software version.

**Price.** You get what you pay for. Obviously, pressure-sensitive tablets cost more than the non-pressure variety. And, the price goes up along with the number of features.

**Try before you buy?** Unfortunately, graphics tablets are still hard to find in many retail outlets, making a presale test difficult. However, being able to use a tablet for a while before you buy is a great way to pinpoint subtle differences and aesthetic concerns. The best place to find demo tablets is a computer convention. At events like Siggraph, MacWorld, Windows World, Seybold, and ImageWorld, you'll find demo tablets of all varieties under one roof! And, most tablet companies demonstrate their tablets with Painter.

When in doubt, call and ask the tablet manufacturers questions! We hope you'll be using your tablet and Fractal products together for a long time - so buy smart! No matter what tablet you choose you'll wonder how you ever got along without one!

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|---|---|
| Acecad | (800) 676-4223 |
| CalComp | (800) 458-5888 |
| Hitachi | (408) 747-0777 |
| Mutoh (formally Kurta) | (800) 445-8782 |
| Summagraphics | (800) 729-7866 |
| Wacom | (800) 922-6613 |