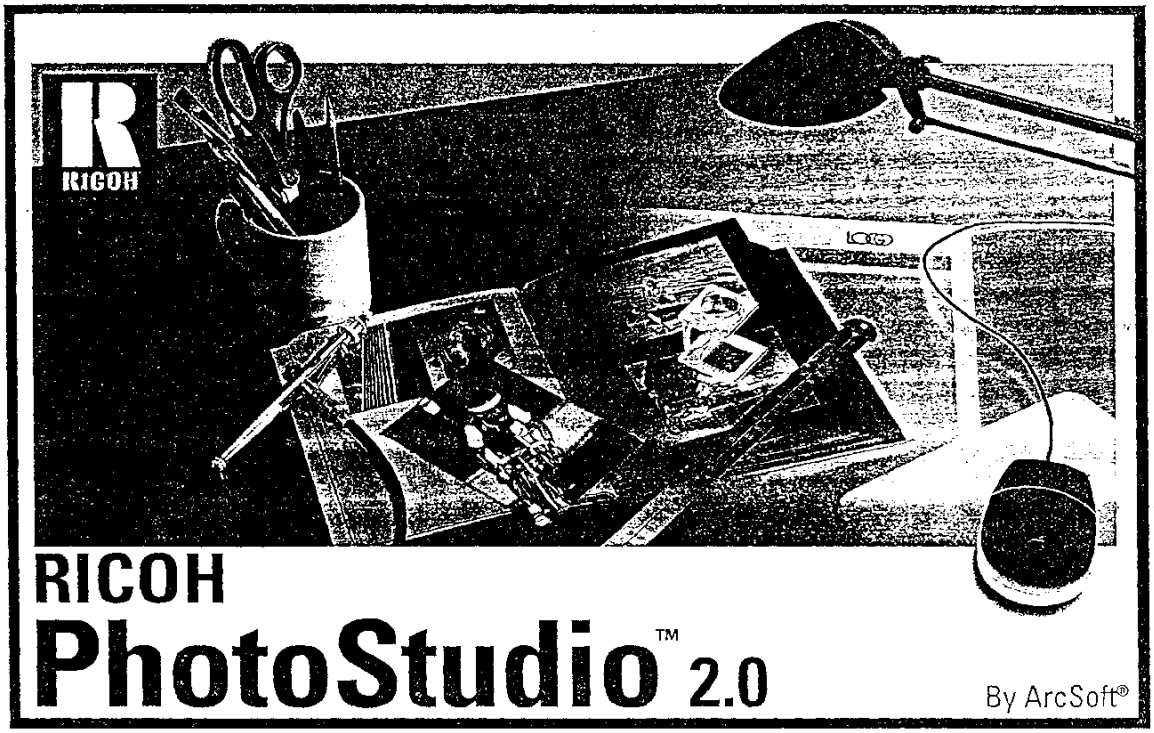
RICOH®



RICOH
PhotoStudio™ 2.0

By ArcSoft®

Chapter 3- Working With Ricoh

User Manual

PhotoStudio & Ricoh Digital Camera

Windows® 3.X, Windows 95® and Windows NT®

Credits For This Manual
Writing - David Chang and Kyle Coachman
Book design and layout - Li Yu

For software technical support and product information, please contact:
Ricoh Corporation
475 Lillard Drive
Sparks, NV 89434
Tel 702.352.1600
Fax 800.544.8246
Internet: www.ricohcpg.com

3 Working With Ricoh PhotoStudio and Ricoh Cameras

This chapter describes some basic concepts and concerns when working with Ricoh PhotoStudio, and Ricoh digital cameras.

Contents

Working with Colors

Defining colors in Ricoh PhotoStudio

It is important to understand the concept of color when working with Ricoh PhotoStudio. This, after all, is an image color processor. It allows you to change, shift, or enhance colors in your image document and select items in your document based on their color similarity.

To describe color, we have to consider how the eye perceives color, and how colors are created. When you perceive color, it is really your brain reacting to the wavelengths of light that reach your eye.

If all wavelengths of light reach your eye, you perceive the white color. If there is no light, you perceive black. If some but not all wavelengths of light reach your eye, you will perceive a particular color. So then by mixing light in different ways we can create virtually every color.

This is how your computer monitor works. By mixing three basic colors (red, green, and blue) in varying amounts, it can create over millions of different colors.

This is the origin of the RGB model for describing color. This model uses three color channels: red (R), green (G), and blue (B). Every pixel in the image is a mixture of these three channels.

Each one of these color channels can have a value anywhere from 0 to 255. The value for a color channel describes the intensity of that color. A value of 0 means that channel has no intensity and will have no effect on a pixel's color, and a value of 255 means that it is at full intensity. So, a pixel with the channel values R = 0, G = 255, and B = 0, will appear as light green; a pixel with the channel values R = 150, G = 0, and B = 150 will be purple, since purple is the result of mixing of red and blue.

There is another popular model for describing colors: the HSV model. Instead of three color channels, the HSV model describes colors with channels for hue (H), saturation (S), and brightness (V).

Hue describes colors based on a special color wheel containing all of the colors of the spectrum, and can have values from 0 to 360. Values for Hue determine the location (in degrees) where a color is at on the color wheel. All millions of the possible colors can be somewhere on the wheel.

Saturation describes the intensity of the color and can be any number from 0 (very gray) to

255 (very colorful).

Brightness describes the lightness/darkness of the color and has values from 0 (black) to 255 (white).

Many people find the HSV model to be more intuitive and therefore easier to work with. Professionals in the graphics and photography industries often prefer to work with HSV because these industries often use this color models. You should try both and see which works best for you.

Active and alternative color swatches

At the bottom of the Tools Palette, you will see two color squares, one lying on top of the other. The color swatch on top is the active color swatch. The tools and commands that utilize color (e.g., Bucket Fill, Paintbrush, Cut) will always use this color as their source. The color on the bottom is the alternative or alternate color. These two colors are both used by the Gradient Fill Tool.

Sometimes you will want to quickly toggle between two colors without having to continually pick colors from the Color Palette or elsewhere. It is very easy to switch the active and alternate colors - just click on the alternate color.

Changing the color of the active swatch

In Ricoh PhotoStudio, there are three ways to select a new color. First, you can simply pick a color from the Color Palette by clicking on any colored square. If the Color Palette is not visible, use the Show Color Palette command from the View menu and it will appear on the desktop.

Another way to change the color is to use the Eyedropper tool; click on any color in the image with this tool and the active color swatch will become the same color.

Finally, you can use the Color Selection dialog box to pick a new active color. This method gives you the widest range of possible colors. To make this dialog box appear, double-click on the active color swatch.

To change the alternative color double-click the alternate swatch.

(See "Color Swatches" in Chapter 4 for detail on using the Color Selection dialog box).

Making color-based selections

You can use the Magic Wand Tool to create selection areas based on color Similarity or Threshold.

When you set the values for Similarity, you are telling the Magic Wand how close to the color of the selected pixel the other pixels in the selection area should be. The smaller the similarity value, the smaller the area of selection will likely be.

For example, if you click the Magic Wand on a pixel which has the RGB channel values 50 for red, 60 for green, and 70 for blue, and you set the similarity to 5 for each of the channels, the magic wand will select only those pixels which have red values that are between 45 and 55, green between 55 and 65, and blue between 65 and 75. Increasing the similarity values will make the above intervals larger.

The Threshold option is simpler than this. It picks all of the nearby colors that are in the same threshold category as the selected color. So if your threshold value is 150 and the color value is 130, the wand will pick all adjacent colors with values less than 150.

(See "Magic Wand Tool" in Chapter 4 for more information).

Image Data Types and Conversions

This section describes the image data types and their conversions that used in Ricoh PhotoStudio. The data type of an image is important because it determines how many colors (or gray levels) the image may contain and how the image can be manipulated in Ricoh PhotoStudio.

About Image Data Types

Ricoh PhotoStudio can read and create five different image data types: 24-bit RGB True Color, 4-bit Indexed 16-Color, 8-bit Indexed 256-Color, 8-bit Grayscale, and 1-bit Black-and-White. Ricoh PhotoStudio is able to easily convert most data types into others.

There are a couple of general differences between the data types worth mentioning up front.

The number of bits per pixel differs for the data types. This number determines the number of colors or shades that can be represented in the image. The more bits per pixel, the more memory is necessary for the image, the more information the image file will contain, and the more realistic it will seem.

Many Ricoh PhotoStudio commands and tools do not work on certain image types. For example, many of the Enhance and Effects commands will not work with 1-bit Black-and-White and Indexed-Color images.

In general, when you want to edit images you should make sure they are either RGB True Color or Grayscale images, because most Ricoh PhotoStudio functions are available when editing these two data types. You can always change them to another form after you finish editing.

1-Bit Black-and-White Images

Pixels in 1-bit Black-and-White images are either black (0) or white (1). This type of image uses only one channel and takes the least memory.

Several editing commands do not work with this type of image. In fact, none of the effects commands and only one of the enhance commands can be used with the Black-and-White image type. Some tools and other commands are off-limits as well.

If you wish to edit a Black-and-White image, try converting it to an 8-bit Grayscale image first. When you are done editing you can change it back to 1-bit Black-and-White.

If an image is going to be printed or used on a device that has only black-and-white capabilities, you may want to convert it to this data type to get an idea of how it will look. Of course, images saved in this data type use much less memory than the others.

Black-and-White images can also be used to create masks and stamps. For more information, see the reference sections on the Mask menu and the Stamp tool.

8-Bit Grayscal Images

Grayscale is a single-channel data type. Pixels can have gray values from 0 to 255; the lower the value, the darker the pixel. Grayscale images have full editing capabilities.

Grayscale data type is the best form for editing images with no color.

Indexed 16- and 256-Color Images

Indexed 16-Color (4-bit) and 256-Color (8-bit) images are single-channel image documents. All of the colors in indexed color images are in the color table, a special palette that can have either 16 (4-bit) or 256 (8-bit) colors. When an indexed-color image is created in Ricoh PhotoStudio, the program picks the most appropriate colors and makes a color table that will give the best representation of the original. Indexed images can be edited in a limited number of ways, but they also take up less disk space and less space in memory.

None of the filters or the effects commands work for indexed-color images. Also, some of the tools also will not work for this image data type.

Some computer systems can only display 16 or 256 colors. Converting an image to indexed-color is a good way to preview what an image will look like on devices that support a limited amount of colors. If an RGB True Color image will be displayed on such a system, it may be better to convert this image to an indexed-color image, because you can control the way that the system approximates the images' colors. Keep in mind, though, that even when the system can not show all of the available colors, Ricoh PhotoStudio can still store them in the image file.

24-Bit RGB True Color Images

RGB True Color image data type contains the maximum amount of information possible for an image, and allows you to choose from over 16 million different colors. This data type uses three channels: red, green, and blue. Each channel can have values from 0 (no color) to

255 (full color). Any Ricoh PhotoStudio command or tool will work with the RGB True Color images.

Image type conversion options

Often you will want to convert an image from one data type to another. When you do so, there are several options that you should understand.

Colors and color palette options

When you convert an RGB True Color image to Indexed-Color image, you will often need to pick a color or a color palette option. There are the major conversion options you may see in Ricoh PhotoStudio conversion commands:

System and **Optimized** are frequently options for the color palette. The System option will use the Windows system palette found in the Windows' Control Panel. An Optimized color palette creates a color palette by sampling the image for the most used colors.

The **666** and **676 System** are two predefined color palettes for 256 color image. The 676-created palette will contain six reds, seven greens, six blues, and combinations of these colors, while 666 will use six of each color channel and their mixtures.

When you convert a Grayscale image into an Indexed 256-Color image, you will need to pick from two options: **Firelight** and **Pseudo Color**. Firelight will convert the Grayscale image into an image that looks as if it is lit by firelight. Its color table will contain shades of red, yellow, and orange. Similarly, Pseudo Color will create a color table from shades of blue, green, yellow, red, white, and black.

Note: Some image data types can not be converted into other data types. If a particular type of transformation is not available for an image, the menu item in the Convert menu will be dimmed.

Dithering options

Converting images to Indexed 16- and 256-Color or Black-and-White images will often create harsh color changes and eliminate many of the contours in your document. Dithering is a way of smoothing out these harsh color changes. Essentially, dithering simulates shades of color or grayness with combinations of pixels. For example, when converting from Grayscale to Black-and-White by using dithering, a square of four pixels that has an average grayness value of 128 would become a square with two black pixels and two white pixels.

There are two main dithering options: Pattern and Diffusion.

A Pattern dither replaces squares of pixels in the image with squares that have representative configurations of pixels in the allowable colors.

A Diffusion dither converts one pixel at a time but transfers the error, or difference, between the original value of the pixel and the new value to nearby pixels. In other words, it "diffuses" the error throughout the picture. This will make the picture look somewhat grainy.

The table shown below summarizes some of the characteristics of the five data types that Ricoh PhotoStudio works with.

Data Type	bits per pixel	# of colors or shades	Availability of editing commands	Special notes
Black-and-White	1	2	very limited	Convert to Grayscale for editing
Grayscale	8	256	most are available	A widely supported data type
Index 16-Color	4	16	limited availability	Convert to RGB True Color for most editing
Index 256-Color	8	256	limited availability	Convert to RGB True Color for most editing
RGB True Color	24	16.7 million	most are available	The best data type for editing

The data type information of the active image is shown on the Status Line.

Acquiring, Importing, and Exporting Images

There are several ways to bring images into Ricoh PhotoStudio, and to export them out for use by other programs.

You can open existing image files of various types by using the Open command, or use the Clipboard and Capture commands to get images from the Windows Clipboard and/or other Windows applications. You can load images directly from a digital camera. And you can also use a scanner or other image input device to acquire images from a slide, photo print, artwork hard copy, or video. After being processed, images can then be saved in one of the formats provided in Ricoh PhotoStudio and then transferred to other applications and system platforms.

Acquiring

Besides fully supporting the Ricoh RDC-1 and RDC-2 digital cameras for acquiring images, Ricoh PhotoStudio can directly interface with and control a digital camera, image scanner, or other input device that supports the TWAIN standard. By installing the device driver provided by the manufacture and selecting this device from the Select Source dialog box, you give Ricoh PhotoStudio the capability to recognize and receive images from your TWAIN-compatible device.

Although the options for acquiring an image are varied for different digital cameras and scanners, selecting a proper resolution to acquire may be the most important choice. For scanning, for example, the higher the resolution selected, the better the printing image quality obtained. However, this is not always true. The printing quality is also determined by the capability of your printer. And be aware that a higher-resolution image requires more memory to work with and to store. If the image is just used for screen display, the resolution may not need to be greater than that of the monitor screen, which is typically from about 70 to 130 dots per inch (dpi).

To get images from a Twain device, select Acquire in the File menu. For more information, see the on-line help references for Acquire and Select Source commands.

Importing and exporting images — about file format

Ricoh PhotoStudio allows you to open and save image documents in many file formats. A file format is the way that the information in an image is stored to a computer file. There are

several standards that different computer devices and programs use to store image information. The file formats supported by Ricoh PhotoStudio represent the most popular formats in use today and will allow you to transfer image information between Ricoh PhotoStudio and virtually any other program that you will want to use.

Some file formats may compress files or give you the option of compressing your files. There are basically two different types of compression: lossy and lossless. Using a lossless compression algorithm such as LZW compression to save your image usually makes the saved file smaller without any information loss. Using a lossy compression may bring you a higher compression ratio, but it will lose some image information. JPEG compression is a good example of lossy compression.

The JPEG format is an excellent way to store final images if you want to save disk space while storing virtually all of the information that uncompressed images have. You can vary the compression ratio depending on how much image information you can sacrifice. The better quality compressed image you want, the less compression you can get.

If you plan to edit an image later, it is not suggested to store your image in a lossy compressed file format, because some small amount of information may be lost each time you save the image. Over the course of many recompressions this may add up to the loss of a lot of information. Also, compression and decompression takes time, and may be burdensome on a slow computer.

To open or save an image document, select Open or Save As command from the File menu, and a dialog box with options for file format will appear. The different file formats supported in Ricoh PhotoStudio include BMP, GIF, PCD, PCX, TARGA, TIFF, and JPEG. And more file formats will be added in Ricoh PhotoStudio.

BMP is the bitmapped file format that is widely used in Microsoft Windows and its applications. A bitmapped file uses a Windows Device Independent Bitmap (DIB) to store the data. These files specify pixel color in a form that is independent of the way that a device represents color. These files generally have the filename extension ".bmp".

TIFF is the Tagged Image File Format. This format works well for transferring images between different computers and is widely used in the printing industry. These files are stored as ".tif".

GIF is the Graphics Interchange Format developed by Compuserve. This is an excellent format to use for transferring files between different types of computers or over phone lines, because it can minimize transfer time. This format can support up to 8-bit resolution. 24-Bit RGB True Color images cannot be stored in this format. These files are labeled ".gif".

PCD is the Photo-CD format developed by Kodak. Images in this format are usually compressed in a compact disc and have several different resolutions available. This format is mainly designed for desktop publishing image transform and can be read (but not saved) in Ricoh PhotoStudio. Photo-CD files are labeled ".pcd".

PCX is a standard format used by many IBM PC programs. It was specifically designed by ZSoft for its PC Paintbrush program. Files in this format are labeled ".pcx".

TARGA is a format developed by TrueVision, a maker of video boards. This format is used by several painting and image enhancement programs. Its files are stored as ".tga".

JPEG is an often-used compression format. This is an excellent format to use when you have finished editing a picture and wish to store it in a highly-compressed form. Using JPEG compression may result in the loss of a small part of your image information. JPEG files generally have the extension ".jpg".

Selecting and Masking Images

About Masks, Marquees, and Selected Areas

The concept of selecting objects in an image is, along with the concept of defining colors, one of the most important ideas in image processing. After all, if you are not using the program to enhance the color and picture quality of your entire image, then you are probably using it to move or change particular areas.

Tasks like changing the color of the sky, making dramatic silhouettes, or rearranging people in a portrait are all possible with Ricoh PhotoStudio, but first, you must be able to select these objects. In this section, we only discuss some basic concepts of selecting.

New Terms

The concept of picking objects or areas centers around several basic terms.

The **selected area** is the part of the image that is surrounded by the marquee. The **marquee** is the dashed moving line that designates the selected area. The selected area is the only part of the image where your edits will have any effect. If there is no selected area, any edits will have effect on the entire image. The term **selection** is synonymous with selected area.

The **mask** is another name for the marquee. You can move the mask around in an image to define an infinite number of selection areas. These areas will have the same shape as the mask.

So we see that a mask is a shape, and a selection is a piece of an image.

What You Can Do

There are several powerful selecting tools and commands in Ricoh PhotoStudio. We will not try to enumerate all of them here; that task is left for the reference part of Tool and Command. Here, we merely wish to hint at some of the fun and interesting things that you can do with the selecting tools and commands.

You can create selections of any shape by using the selecting tools.

You can make a selection based on the color of an area. For example, if you want to change the color of the sky from blue to red, the magic wand tool can select the sky with just one click.

You can copy a selection from your image onto the clipboard, and then paste it on other Ricoh PhotoStudio images or on other applications.

Again, these are not all of the things you can do with the selecting and masking functions, but hopefully they will give you an inkling of what you can do with Ricoh PhotoStudio. For more information on making selections, please refer to "Rectangle Select Tool", "Ellipse Select Tool", "Freehand Select Tool", and "Magic Wand Tool" in Chapter 4, and the on-line help for the Mask menu.

Working with Adobe Photoshop Plug-In Filters

Ricoh PhotoStudio supports Photoshop Plug-In filters for image import, export and special effects. When started, Ricoh PhotoStudio will first search all the *.8ba (for import), *.8be (for export), and *.8bf (for effects) files in its PLUGINS subdirectory, and then the directories that are shown in the entry of the PluginDir1, PluginDir2, and 3 etc. in the PSTUDIO.INI file that is located in the Windows directory. If any these type of files installed in the PLUGINS directory or identified in the path entry in the PSTUDIO.INI file, the Import, Export, and Plug-In Filters submenu will appear in the File and Effects menu respectively, and the filters are listed.

For example, if you have Kai's Power Tool special effects filters installed in both of the C:\KPT and C:\KPT1 directories and you want Ricoh PhotoStudio support them, you shall add the following lines in the C:\WINDOWS\PSTUDIO.INI file:

PluginDir1=C:\KPT
PluginDir2=C:\KPT1

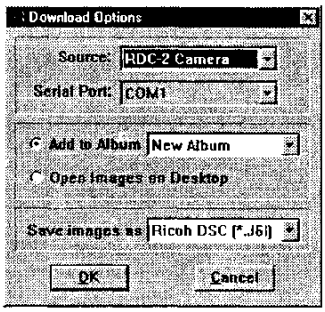
Including the PLUGINS subdirectory, Ricoh PhotoStudio supports up to five directories that contain plug-in filters.

Working with Ricoh Digital Cameras

The Ricoh PhotoStudio is a customized program based on the ArcSoft PhotoStudio v2.0. While containing all the functions in the ArcSoft PhotoStudio, two commands are added in the Ricoh version so that the functions for downloading images from a Ricoh camera and uploading images to a Ricoh camera are seamlessly integrated with the existing PhotoStudio functions. Without leaving Ricoh PhotoStudio, you can now download the photo images from a Ricoh RDC-1, RDC-2 camera or PC card and save them in a Ricoh PhotoStudio album, then manipulate, retouch, composite, and apply special effects on the images, and finally output the images through a color printer, or save them back to the camera or PC card for future presentations.

Download images from a Ricoh camera

For downloading images from a Ricoh RDC-1 or RDC-2 camera, you must use the Download From Ricoh Camera command in the File menu. When this command selected, the Download Options dialog box appears, which sets options for downloading image files from a Ricoh digital camera to your PC computer.

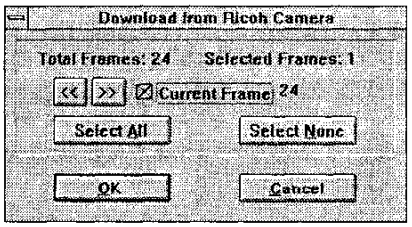


Options in the Download Options dialog box:

Source	Shows the currently selected model of Ricoh camera or PC card drive for downloading images from a list.
Serial Port	Shows the currently selected Serial Port that should connect to the camera. If you are using the RDC-2 camera, serial port will be automatically detected.
Add To Album	If this button is selected, the downloaded image files from a camera or PC card will be saved to your computer hard drive and inserted into a selected album from the list on its right hand side.

Open Images on Desktop	If this button is selected, the downloaded image files from a camera or PC card will be saved to your computer and then be opened on the Ricoh PhotoStudio desktop for viewing and editing.
Save Images As	Your images downloaded from a camera or PC card will be saved to your computer's hard disk drive in the selected file format shown on the box. The original file format for the images in the camera is J6I, but your can select a different format from the list box.

Please refer the camera instruction manual for how to setup the communication between camera and computer. When the options are set, click OK and then the computer will start to communicate with the camera or PC card drive. If you choose to download images from your Ricoh RDC camera, and the communication is created successfully, the Download From Ricoh Camera dialog box will appear for immediately downloading. If you choose to download images from your PC card drive, the selected album will appear for inserting images in the PC card into the album, while copying them to the hard drive.



Options in the Download From Ricoh Camera dialog box:

Total Frames	Shows the number of total image files contained in the camera.
Selected Frames	Shows the number of total image files that are selected for downloading from the Ricoh camera.
Current Frame	Shows the frame number of the current image. This image will be displayed on the camera LCD screen if there is one attached.
"<<" and ">>" Buttons	Instead of the current frame, if you want to see and download the other images in the camera, click on the "<<" (Reverse) or ">>" (Forward) button for the last or next image frame. If you want to download the current frame, make sure the Select (square) button is checked.

Select All	If this button is clicked, all images in the camera will be selected for downloading.
Select None	If this button is clicked, all images that have been selected currently will be unselected for downloading.

To load images from a Ricoh camera:

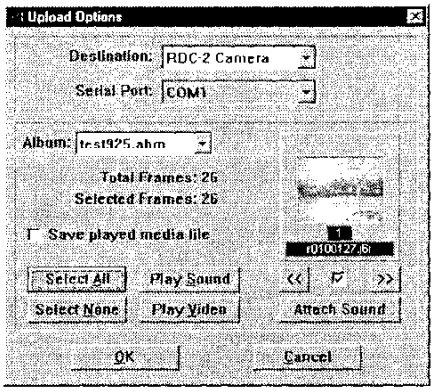
1. Choose the Download From Ricoh Camera command from the file menu. The Download Options dialog box appears.
2. Choose a camera model that is connected to your computer from the Source box. And make sure you connected your camera on a right serial port.
3. Click on the Add To Album button and select an album from the list box if you want to insert the downloaded images into an existing album. (If you want to put images in a new album, select the NEW album from the list.) Otherwise, click on the Open Images on Desktop button to open the downloaded files on the desktop.
4. Select a file format to save the downloaded images. You can either use the original camera file format J6I, or others.
5. Click OK to create communication. If the communication is created successfully, the Download From Ricoh Camera dialog box appears.
6. In the Download From Ricoh Camera dialog box, you may select frames by clicking the button "<<" (Reverse) or ">>" (forward). Make sure the Select (square) button is checked if you want to download the current frame.
7. Repeat the step 6 if you want to download more images. Or click the Select All button if you want to download all images. If you want to unselect the currently selected images for downloading, click the Select None button.
8. Click OK to start downloading the selected images.

Upload images To a Ricoh camera

For uploading image and sound files to a Ricoh camera or PC card, you must use the Upload To Ricoh Camera command in the File menu. When this command selected, the Upload Options dialog box appears, which sets options for uploading image files to a Ricoh digital camera or PC card from your PC computer.

Options in the Upload Options dialog box:

Destination	Shows the currently selected model of Ricoh camera or PC card for uploading from a list.
Serial Port	Shows the currently selected Serial Port should connect to the camera. If you are using the RDC-2 camera, serial port will be automatically detected.



Album	Shows the selected Ricoh PhotoStudio image album from a list of albums. Select the one which contains your J6I images for uploading to a Ricoh camera.
Image Thumbnail	Shows the current image included in the selected album. If you want to select it for uploading, make sure the Select (square) button underneath is checked. If you want to see the other images in the album, click on the "<<" (Reverse) or ">>" (forward) button for the last or next image frame. If you see a speaker on an image thumbnail, it means there is a sound file attached with the image.
Attach/Detach Sound	This button can be either "Attach Sound" or "Detach Sound". If there is a sound file attached with the current image, the button is "Detach Sound". Pressing this button will separate the sound file from the image and "Attach Sound" appears. If there is no sound file attached with the current image, the button is "Attach Sound". Pressing this button will show up a dialog box for selecting a sound file to attach with the current image and "Detach Sound" appears.
Total Frames	Shows the number of total J6I image files contained in the currently selected album. Only J6I files can be uploaded to a Ricoh camera.
Selected Frames	Shows the number of total J6I image files that are selected for uploading to the Ricoh camera. The thumbnail images with the checked Select (square) button underneath are counted.

Save played media file	If this button is checked, the played sound or video file will be saved to the camera.
Select All	If this button is clicked, all J6I images in the current album will be selected for uploading.
Select None	If this button is clicked, all J6I images in the current album will be unselected for uploading.
Play Sound	If this button is clicked, the currently selected sound file will be played.
Play Video	If this button is clicked, the currently selected video file will be played.

To upload images to a Ricoh camera or PC card:

1. Choose the Upload to Ricoh Camera command from the file menu. The Upload Options dialog box appears.
2. Choose a camera model or PC card that is connected to your computer from the Destination box. And make sure you connected your camera on a right serial port if you select a camera for uploading.
3. Click on the Album list box and select the album, which may contain the J6I images for uploading, from the list.
4. Search all J6I images by clicking the "<<" or ">>" button and check the Select (square) button to make the current image available for uploading. If you want to upload all the J6I images in the album, click on the Select All button.
5. If you want to remove the attached sound from the current image, click the "Detach Sound" button. If you want to attach a sound file with the current image, you shall click the "Attach Sound" button and select a sound file for attaching.
6. Click OK to start uploading. Please refer the camera user's manual for how to setup the communication.