

csImageFile - Version 7.0

COM Object for Image Resize, Editing and Manipulation

This is a COM object that enables images of various formats to be created, resized or edited. It is a non-visual component developed for server side scripting, especially Active Server Pages, and functionality allows dynamically produced images to be sent straight to the browser. It can also be used by other COM enabled tools including Cold Fusion and ASP.NET.

A free, fully functional trial version of csImageFile is available. This trial version has a built in expiry date that causes most of the functions to stop working after that time. This is the only difference in functionality between the trial and full versions. This means that you can fully test if this component is suitable for your application before considering whether to license the full version.

Using These Instructions

These instructions are divided into a number of sections with the relevant methods and properties described in each. There are quick links to some sections below. A full Table of Contents is available on the next page and an index listing all commands in alphabetical order is included at the back for easy reference. The PDF version also has bookmarks for direct navigation to each heading.

Click on one of the links below to go directly to the section of interest:

- [Registering the Component and Getting Started](#)
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1. Registering the Component and Getting Started

1.1. Registration and Server Permissions

Before the component can be used the DLL file, csImageFile.dll (or csImageFileTrial.dll for the trial version) must be registered on the server. This can be done using the command line tool REGSVR32.EXE which should be in the Windows System folder. The syntax is:

```
regsvr32 dllname
```

where *dllname* is the path and name of the DLL to register. Chestysoft has a free utility that performs this function through a Windows interface which can be easier although the result is identical. This tool can be downloaded from the Chestysoft web site: www.chestysoft.com/dllregsvr/default.asp

The application that uses the component must have permission to read and execute the DLL. In a web application like ASP this means giving the Internet Guest User account Read and Execute permission on the file. This account must also have the appropriate permissions for file handling. Read permission is required to read/open an image from disk. Write permission is required to create a new file or edit an existing file and Modify is required to delete an existing file. These permissions can be set in Windows Explorer and applied to either a folder or individual files.

1.2. Object Creation

In any script or programme that uses the component an object instance must be created. The syntax in ASP is as follows.

For the full version:

```
Set Image = Server.CreateObject("csImageFile.Manage")
```

For the trial version:

```
Set Image = Server.CreateObject("csImageFileTrial.Manage")
```

In both cases the object name is "Image", but any variable name could be used.

1.3. The Trial Version

The trial version of the component is supplied as a separate DLL called csImageFileTrial.dll, with a class name of "csImageFileTrial.Manage". This trial version is fully functional but it has an expiry date, after which time it will stop working. The object can still be created after the expiry date but it cannot load or create images.

The expiry date can be found by reading the *Version* property.

Version - String, read only. This returns the version information and for the trial, the expiry date.

Example:

```
Set Image = Server.CreateObject("csImageFileTrial.Manage")  
Response.Write Image.Version
```

Visit the Chestysoft web site for details of how to buy the full version - <http://www.chestysoft.com>

1.4. Accessing Files Across a Network

When csImageFile is called from a server side IIS application it runs as the Internet Guest User account (IUSR_machine_name). This is an internal user account and it is not recognised by other computers on the network, so csImageFile will not be able to access network files for reading or writing without further configuration. One solution is to configure Component Services and create a COM+ Application containing csImageFile. This allows a different Windows account to be used when csImageFile is running.

To configure Component Services (found in Administrative Tools) expand the tree view on the left starting with the Component Services node. Below this is "Computers", "My Computer" and "COM+ Applications". Right click on COM+ Applications and select New Application and this opens the COM Application Install Wizard. On the first page of the wizard click the button to create an empty application, give it a name and leave the radio button set to "server application". The next page allows you to select an account that will be used when the component runs. The default is the current logged on user but any network account can be used and the username and password entered. That completes the wizard and the application now appears on the tree. Expand this and right click on the Components folder and select New Component to begin the COM Component Install Wizard. If the component is already registered the middle button can be clicked and csImageFile selected from the list.

The properties of the COM+ Application can be modified by right clicking on the application in the tree view. It is important that the checkbox marked "Enforce access checks..." on the Security tab is cleared, otherwise an ASP 0178 error may result. In earlier versions of Windows this box is clear by default but in Windows 2003 it is checked by default so it must be modified.

Always restart IIS after making changes to a COM+ Application.

It is not usually necessary to perform this configuration unless files need to be accessed across a network although it may be required in order to use the *ReadURL* command.

1.5. Windows 2003 / 2008 Server x64

csImageFile is a 32 bit DLL but it can be used on 64 bit systems if it is added to a COM+ Application as described in Section 1.4 above.

An online description of configuring Component Services is available here:

<http://www.chestysoft.com/component-services.asp>.

2. Import and Export of Images

An image must be loaded into memory if it is to be processed in some way or converted to another format. Images can be loaded from disk, from a variant array variable (which may be a database field or a file uploaded through our csASPUUpload component), from a remote URL or by using the handle to a Windows bitmap.

The image in memory can be exported by saving to disk, or as a variant array variable (which may be sent to the browser using the ASP Response.BinaryWrite function, or saved into a binary database field). The image can be exported using the Windows bitmap handle and this is an efficient way of copying images between instances of csImageFile.

Supported file formats are BMP, GIF, JPG, PCX, PNG, PSD, TIF and WBMP. Images can be exported to PDF format. Some description of these formats is provided in Section 14.

2.1. Methods for Import and Export

ReadFile *Path* - This loads an image into memory from disk where *Path* must be the full physical path and filename of the image. Version 5 of csImageFile will read an image, even if the extension is incorrect, if the data is in a valid supported format.

Example:

```
Image.ReadFile "C:\images\somefile.jpg"
```

WriteFile *Path* - This saves the current image to disk, where *Path* is the full physical path and filename of the new file. The file extension determines the format used and it must be one of the supported formats. It can be a different extension to that of the original file and this is how images can be converted between formats.

ReadVariant *FileData* - This reads an image into memory from binary data. *FileData* must be a variant array containing the file information in one of the supported image formats. The variant array (or OLE Variant) is an ActiveX data type commonly used in ASP but it is not supported in all programming environments. *ReadVariant* may be used to read from our csASPUUpload component, another instance of csImageFile, a VBScript variable or a binary database field.

Example of reading a file directly from csASPUUpload:

```
Image.ReadVariant Upload.FileData(0)
```

This will read the file from the csASPUUpload object called "Upload" assuming it is the first file in the array, or the only uploaded file. If the file is not a valid image it will generate an error.

Example of reading a file from a binary database field:

```
FileData = RS("Image")  
Image.ReadVariant FileData
```

The data must first be passed to a VBScript variable before the *ReadVariant* command will accept it. The field name is called "Image" and the recordset is called "RS".

ReadStream *ImgType*, *FileData*- This command has been replaced by *ReadVariant* although it is still supported to retain compatibility. *FileData* is the image as a variant array variable and *ImgType* is a string containing the extension of the file format, e.g. "jpg", "bmp" etc. *ReadStream* could be used if it is important to verify that a file is in a particular format.

ReadURL *URL* - This loads an image into memory from a remote web server where *URL* is the location of the image complete with the protocol prefix "http://" or "https://". Version 5 of

csImageFile will read the image if it is in a supported format regardless of the extension or content type. A username and password can be sent with the request by setting the *URLUsername* and *URLPassword* properties before calling *ReadURL*. The user agent request header can be specified by setting the *HTTPUserAgent* property before calling *ReadURL*. The timeout for *ReadURL*, in seconds, is specified by the *HTTPTimeout* property, which defaults to zero, or unlimited.

Note that if the computer running the script is connecting to the internet through a proxy, csImageFile must be added to a COM+ Application as described in Section 1.4. If a firewall is restricting which applications are allowed to access the internet it is "inetinfo.exe" which must be given permission for a script running in IIS. Refer to your firewall documentation for more information.

DPMToDPI(<i>dpm</i>)	-	Integer return value. Converts a dots per metre value, <i>dpm</i> , to dots per inch. <i>dpm</i> is an integer.
DPIToDPM(<i>dpi</i>)	-	Integer return value. Converts a dots per inch value, <i>dpi</i> , to dots per metre. <i>dpi</i> is an integer.

2.2. Properties for Import and Export

The following properties are related to the import and export of images and they include general properties such as *Width*, *Height* and *DPI*. Some are specific to certain formats such as *JpegQuality* and *ProgressiveJpeg*. Some are set when the image is read or created while others can be set before export to alter some feature of the image.

Height	-	Integer, read only. The height of the currently loaded image in pixels. This is read only. To change the size use <i>Resize</i> , <i>Scale</i> or <i>ResizeFit</i> .
Width	-	Integer, read only. The width of the currently loaded image in pixels. This is read only. To resize the image use <i>Resize</i> , <i>Scale</i> or <i>ResizeFit</i> . To check if an image is loaded in memory, test for either the <i>Width</i> or <i>Height</i> having a non zero value.
ColorDepth	-	Integer, must be 1, 4, 8 or 24. This is the bits per pixel for the current image where 1 bit is a 2 colour image, 4 bit is 16 colours, 8 bit is 256 colours and 24 bit is 16 million RGB colour. These are the only colour depths supported by csImageFile. The property is set when an image is imported and it defaults to 24 for an image created with <i>NewImage</i> . <i>ColorDepth</i> can be edited. Reducing the colour depth may reduce the memory requirement of the image while some image processing requires a 24 bit setting. Use <i>ConvertToBW</i> to convert to 1-bit black and white.
DPI	-	Integer. The pixel density of the image in dots per inch. csImageFile has one property for the pixel density so setting <i>DPI</i> sets both X and Y pixel density and when an image is loaded it is the X pixel density that sets the property. Note that GIF and WBMP images do not use this property and it is an optional extension for PNG.
When an image contains Exif data which includes the XResolution and YResolution tags, these values are changed when the DPI property is changed. This is new in version 5.		
YDPI	-	Integer, read only. This will return the vertical pixel density but it is read only. It is not possible to save an image with csImageFile and set different values for horizontal and vertical pixel densities.
JpegQuality	-	Integer in the range 1 to 100. This determines the amount of compression used when an image is exported in JPEG format. A high value is a high quality, large file size. Saving files with a lower value for <i>JpegQuality</i> is one method of reducing file size but it does reduce image quality. (Default = 90)
ProgressiveJpeg	-	Boolean. If true a JPG will be saved using progressive compression instead of baseline. This property is set when a JPG is loaded. Note that Internet Explorer does not display a progressive JPG until the entire file is loaded, which is the opposite of what the name suggests. (Default = false)

JpegGrayScale - Boolean. JPG images can be stored in an 8-bit greyscale format and this property is set when a JPG is loaded. Setting *JpegGrayScale* to true will convert a colour image to 8 bit greyscale and it will be exported in this format if saved as a JPG. (Default = false)

JpegHigherSpeed - Boolean. When set to true any JPG will be loaded using a reduced colour depth. The image will load at a higher speed at the expense of some image quality. Set the property before calling *ReadFile*, *ReadVariant* or *ReadURL*. (Default = false)

TransparentColor - String, as a six character "RRGGBB" colour. This is used as the transparent colour when an image is exported in GIF or PNG format, if the *Transparent* property is set. *TransparentColor* is set when a GIF or PNG image with transparency is loaded. *TransparentColor* is used in the merge functions when foreground transparency is used. It also determines the background colour of rotations that are not multiples of 90 degrees and when the *Crop* method is used to enlarge the image area. (Default = white, "FFFFFF")

This property was called *BGColor* in versions of *csImageFile* earlier than 6.2. *BGColor* can still be used but it always takes the same value as *TransparentColor*.

*** Note *** Colours in *csImageFile* are always specified as a string value, in the same way as HTML. For example, red is "FF0000" and blue is "0000FF". These strings are not case sensitive and any leading "#" character will be automatically removed.

Transparent - Boolean. When true any image output in GIF or PNG format will contain a transparent colour and this colour is specified by *TransparentColor*. This property is set when a GIF or PNG is loaded. *Transparent* is also used in the merge functions to allow foreground transparency. (Default = false)

FileSize - Integer, read only. This is the size of the image in memory when it was first loaded from disk or a binary variable.

OriginalimageType - Integer, read only. When an image is loaded this property is assigned an integer value to represent the format of that image. It can be used to identify the format if the image was loaded with *ReadVariant* or *ReadURL*, or if the original file was saved using the wrong extension. The possible values are: -1 - no image loaded, 0 - BMP, 1 - GIF, 2 - JPG, 3 - PCX, 4 - PNG, 5 - WBMP, 6 - PSD, 7 - TIF.

IgnoreInputFileType - Boolean. *csImageFile* version 5 can read an image that has the wrong extension, and this is the default behaviour. Set *IgnoreInputFileType* to false to raise an error if an image format does not match the extension. (Default = true)

OverwriteMode - Integer, must be 0, 1 or 2. Used with the *WriteFile* method to determine what to do with duplicate file names. The default is 0 and this causes files to be saved with the name specified in *WriteFile*, even if a file by that name already exists. 1 will prevent *WriteFile* from saving a file if the file name exists. 2 will cause the file to be renamed if the name is already used and *~n* is added to the end of the name where *n* is the lowest available number. A typical use of *OverwriteMode* is to set it to 2 when reading in files from our *csASPUUpload* component to prevent deletion of duplicate file names.

OverwriteChr - String. If *OverwriteMode* is set to 2 and a numbered suffix is added to the file name the value of *OverwriteChr* is used to separate the file name and the suffix number. The default is "~" but this can prevent a file from being downloaded on Windows 2003 or if *URLScan* is being used.

FileName - String, read only. After saving a file with *WriteFile* the full path and name actually used for the file is stored in this property. This may be different from the path specified if *OverwriteMode* is used.

NewFileSize(*Type*) - Integer, read only. This is the file size that will be produced if the current image is exported in the format specified by *Type*. *Type* must be the string value "jpg", "bmp", "png", "pcx", "psd", "gif", "tif" or "wbmp".

WasCMYK - Boolean, read only. This gets set to true if a JPG, TIF or PSD image is read in CMYK format. It indicates that the image has been converted to RGB.

UseLZW - Boolean. When false support for LZW compression (for GIFs and some TIFs) is disabled. It was introduced when there was a patent relating to LZW compression but this has since expired and the property is unlikely to be needed. (Default = true)

2.3. Properties for Binary Image Export and Streaming

The following properties return the current image as a variant array, which is the format used by the ASP Response.BinaryWrite command. They are used to stream an image to the browser, as described in more detail in [Section 10](#). This format can also be used to copy an image into a binary database field. Not all programming environments support the variant array data type.

A separate property is used for each supported image type.

JPGData - Variant array, read only. The image in JPG format.

Example of sending a JPG to the browser:

```
Response.ContentType = "image/jpeg"  
Response.BinaryWrite Image.JPGData
```

This would be used inside a script that is called from inside a tag, as described in Section 8.

GIFData - Variant array, read only. The image in GIF format.

Example of saving a GIF into a binary database field:

```
RS("ImageField") = Image.GIFData
```

This assumes the binary database field is called "ImageField" and that the recordset is called "RS".

BMPData - Variant array, read only. The image in bitmap format.

PNGData - Variant array, read only. The image in PNG format.

TIFData - Variant array, read only. The image in TIF format.

PCXData - Variant array, read only. The image in PCX format.

PSDData - Variant array, read only. The image in PSD format.

WBMPData - Variant array, read only. The image in wireless bitmap format.

PDFData - Variant array, read only. The image in PDF format.

The following property is used for import and export .

BMPHandle - Integer. The Windows handle of the image stored in memory. This can be used to exchange images with other COM enabled tools, such as Visual Basic, but it is also an efficient way to pass an image between instances of csImageFile. Reading the property returns the handle to a copy of the image so any modifications done to the exported image do not affect the image in memory.

Example of copying images between instances of `csImageFile`:

```
Image1.BMPHandle = Image2.BMPHandle
```

This copies the image from an instance called `Image2` to the instance called `Image1`. It does not copy any of the properties, such as *DPI*, *Transparent* or any of the metadata. Use *ReadVariant* with one of the above properties to copy the image and the associated properties.

2.4. TIFF Compression and Multipage Support

This section only applies to TIF files.

CompressionType - Integer, must be 0, 1 or 2. This specifies the compression type that will be used when a TIF file is saved. 0 is no compression, 1 is Packbits compression and 2 is Group 4 compression, which can only be used on black and white images. If a colour image is saved as Group 4 (`CompressionType = 2`) it will be converted to black and white if it is not already. (Default = 0)

CompressionType can also take the values 3 and 4 when a TIF is loaded and these indicate that the original compression was Group 3 and LZW respectively. `csImageFile` does not save TIFs using these compression types and attempting to do so will result in Group 3 compression saved as Group 4 and LZW compression saved as Packbits.

The TIF format allows for multiple images, or pages, to be saved in a single file. This is most commonly used with black and white images that have been scanned or faxed but it can be used with any TIF images. `csImageFile` provides functionality to count the number of pages, extract a specified page, or manipulate the pages within the file.

ImageCount (*FileName*) - Integer property, read only. This returns the number of images contained within a file. *FileName* is a string and must be a complete physical path to the file, including the file extension. Note that reading of multiple images is currently only possible with TIF files, so for other files this function will normally return the value 1. *FileName* can alternatively be a remote URL, beginning with "http://".

ImageCountBinary (*ImageData*) - Integer property, read only. This returns the number of images contained within a TIF stored in the variant array variable, *ImageData*. It could be used when the image is stored in a binary database field or after uploading with our `csASPUUpload` component.

ReadImageNumber - Integer property. Specifies the image that will be read from a TIF file or variant array in TIF format containing multiple images. This property is used by the *ReadFile*, *ReadURL* and *ReadVariant* methods, as well as the merge functions. (Default = 1).

Example of reading the last page from a multipage TIF:

```
Image.ReadImageNumber = Image.ImageCount("C:\images\sample.tif")  
Image.ReadFile "C:\images\sample.tif"
```

In summary the number of pages is found using *ImageCount* or *ImageCountBinary*. The required page is specified by setting the *ReadImageNumber* property before calling one of the methods that loads an image.

The *InsertTIF* and *DeleteTIF* methods are used to manipulate the pages of an existing TIF file that is stored on disk.

InsertTIF *Source, Destination, Page* - Inserts the image as an additional page into an existing TIF file. The existing file is read from disk, and a new file is saved with the additional image added. The new file can either overwrite the existing one, or be saved with a different name. *Source*

must be a complete path to the existing file, *Destination* is a complete path to the new file to be created, and *Page* is the position in the TIF file where the image will be inserted with the first image in the file being *Page* = 1. *Source* and *Destination* are strings, *Page* is an integer.

Source and *Destination* can be identical, in which case, the existing file is replaced. If *Destination* is an empty string, the existing file will be replaced. If *Source* is an empty string or if it cannot be found, *Destination* will be created new with only the single image. If *Page* is set to zero, the image will be inserted at the end of the file.

DeleteTIF *Source, Destination, First, Count* - Deletes a range of consecutive images from an existing TIF file and saves the file, either overwriting the existing file, or creating a new file. *Source* must be a complete path to the existing file, *Destination* is a complete path to the new file to be created, *First* is the position in the TIF file of the first image to be deleted and *Count* is the number of images to be deleted. For example, if *First* is 4 and *Count* is 3, the images numbered 4, 5 & 6 would be deleted. *Source* and *Destination* are strings, *First* and *Count* are positive integers. If *First* and *Count* are invalid values, no deletion will take place but no error will be generated.

Source and *Destination* can be identical, in which case, the existing file is replaced. If *Destination* is an empty string, the existing file will be replaced.

The *AddToTIF* method allows a multipage TIF to be built in memory so that it can be exported as a full file. The pages stored in memory are compressed as specified by *CompressionType*. A black and white image using Group 4 compression should not take up much memory but using *AddToTIF* with coloured images can use up large amounts of memory so this function should be used with caution.

AddToTIF *Page* - Stores the image temporarily in memory as a page which is ready to be written to a TIF file. *Page* is the number of the page in the TIF file where the image will be saved. If *Page* is set to zero, the image will be positioned at the end of the file. Any TIF exported by *WriteFile* or *TIFData* will include all the pages added by *AddToTIF*. *AddToTIF* does not need to be called when working with single page TIFs. *Page* is an integer.

ClearTIF - Clears all the images from memory that have been stored using *AddToTIF*.

2.5. Export to PDF

This section only applies to the export of PDF files.

Single images can be exported to PDF format by using the *WriteFile* method described earlier, if an extension of ".pdf" is specified. They can be streamed to a browser or database field using the *PDFData* property, also described earlier. The following methods are used to create multipage documents.

AddToPDF *Page* - Stores the image temporarily in memory as a page which is ready to be written to a PDF file. *Page* is the number of the page in the PDF file where the image will be saved. If *Page* is set to zero, the image will be positioned at the end of the file. Any PDF exported by *WriteFile* or *PDFData* will include all the pages added by *AddToPDF*. *AddToPDF* does not need to be called to produce single page PDFs. *Page* is an integer.

ClearPDF - Clears all the images from memory that have been stored using *AddToPDF*.

When creating PDF documents the value of the *DPI* property will affect the size of the image when it is displayed.

3. Image Resize and Manipulation

3.1. Methods for Image Manipulation

The most common type of image manipulation for which `csImageFile` is used is the resizing of images. Three methods are provided for this, *Resize*, *ResizeFit* and *Scale*.

Resize *Width, Height* - The current image will be resized to new pixel dimensions *Width* and *Height*. If either parameter is zero the other will be used to determine the new size and the aspect ratio will be maintained. *Width* and *Height* are integers.

Example:

```
Image.Resize 100, 0
```

This resizes the image to 100 pixels wide while maintaining the aspect ratio. In VBScript there are no brackets around method parameters. There is no equals sign because it is a method call.

ResizeFit *MaxWidth, MaxHeight* - If the current image has a width or height greater than *MaxWidth* or *MaxHeight* it will be resized to fit within those dimensions while maintaining aspect ratio. If the image already fits within *MaxWidth* and *MaxHeight* it will be unchanged. *MaxWidth* and *MaxHeight* are integers.

Scale *Factor* - The current image will be scaled by *Factor* percent, where *Factor* is an integer. Images that are scaled always maintain aspect ratio.

Example:

```
Image.Scale 50
```

This scales the current image to 50% of original size. (The width is scaled by 50% and the height is scaled by 50% so the area is reduced to 25% of its original size.)

NewScale *Factor* - This is identical to the *Scale* function and was introduced to avoid a clash of names for Visual Basic users.

The following method, *NewImage*, is important because it is used to create a blank image which can be used for drawing or writing onto or as a background with one of the merge functions.

NewImage *Width, Height, Color* - This loads a blank image into memory, deleting any previously loaded image. It is *Width* x *Height* pixels in size and the colour is determined by the *Color* parameter. *ColorDepth* is set to 24 after calling *NewImage*. *Width* and *Height* are integers and *Color* is a 6 character string representing the "RRGGBB" colour value.

The following methods provide simple image manipulation functions.

Crop *X1, Y1, X2, Y2* - The parts of the rectangle outside the area defined by the opposite corners (*X1, Y1*) and (*X2, Y2*) will be removed. Note that coordinates are measured across and down from the top left corner of the image. The parameters are integers.

Crop can also be used to increase the area of the image by specifying coordinates that are outside the image. In this case the new area will be the colour of *TransparentColor*.

Rotate *Angle* - Rotates the image by *Angle* degrees anticlockwise. If the angle is not a right angle the new image will be centred on a larger rectangle, the colour of which will be defined by the *TransparentColor* property. If *Resample* is true and if the image has a colour depth of 24 bit the image will be smoothed during rotation. *Angle* is a floating point number.

FlipX - The image is reflected about an axis parallel to the x-axis running through the centre of the image. The top row of pixels becomes the bottom row and the bottom becomes the top.

FlipY - The image is reflected about an axis parallel to the y-axis running through the centre of the image. The left column of pixels becomes the right column and the left becomes the right.

The following methods perform image effects and colour adjustments.

Brightness *Value* - This adjusts the brightness of the image. *Value* is an integer between 0 and 100 where 0 is very dark, 100 is very bright and 50 is unchanged.

Contrast *Value* - This adjusts the contrast of the image. *Value* is an integer between 0 and 100 where 0 is zero contrast, 100 is maximum contrast and 50 is unchanged.

ColorAdjust *Value, Red, Green, Blue* - This adjusts the brightness of one or more of the primary colours. *Value* is an integer between 0 and 100 which describes the adjustment to the brightness. 0 is very dark, 100 is very bright and 50 is unchanged. *Red, Green* and *Blue* are Boolean values and specify which colours are adjusted. If all three are true it is identical to the *Brightness* method. When used after a *GrayScale* command *ColorAdjust* produces an image that appears to be viewed through a coloured filter.

Example:

```
Image.ReadFile "c:\images\photo.jpg"  
Image.Greyscale  
Image.ColorDepth = 24  
Image.ColorAdjust 70, true, true, false
```

This would give the image a kind of sepia tinge. Two *ColorAdjust* commands could be used to adjust the colours by different amounts of red and green.

HLSAdjust *Hue, Lightness, Saturation* - This can adjust one or more of the components in HLS colour space. The parameters are floating point numbers between -100 and +100, where 0 is no change. *Hue* is measured on a circular scale and an adjustment of 100% in either direction brings it back to the starting point. Adjusting *Lightness* or *Saturation* by -100% will set them to zero while adjusting by +100% will double the existing value.

Example:

```
Image.HLSAdjust 0, 0, 30
```

This would increase the colour saturation of the image by 30%, leaving hue and lightness unchanged.

CombineColors *Color, DeltaRed, DeltaGreen, DeltaBlue* - This converts similar colours in a range to a single colour. The new colour is specified by *Color*, which is a string in the form "RRGGBB". The range of colours that will be combined is defined relative to *Color* by the difference in RGB components *DeltaRed, DeltaGreen* and *DeltaBlue*, which are integer values between 0 and 255.

ColorReplace *OldColor, NewColor* - This will replace any pixels coloured *OldColor* and change them to *NewColor*. These parameters are strings. This command applies to 24 bit colour images only. Use *PaletteEntry* to edit the colour palette for low colour images.

Sharpen - Applies a sharpening filter to the image.

SharpenBy *Value* - Applies a sharpening filter where the amount of sharpening is defined by *Value*, which is an integer between 1 and 10. 1 is low sharpening, 10 is high and 5 is the same as the *Sharpen* method.

Blur - Applies a blurring filter to the image.

BlurBy Value - Applies a blurring filter where the amount of blurring is defined by *Value*, which is an integer between 1 and 10. 1 is the least blurring, 10 is the most and 5 is the same as the *Blur* method.

GrayScale - Converts the image to a 256 colour greyscale image. The alternative spelling "GreyScale" is also accepted.

ConvertToBW - Converts the image to a 2 colour black and white image.

The following functions can convert between OLE_COLOR values and the 6 character strings that csImageFile uses for colours.

OLEColorToStr(Color) - This function takes a 4 byte OLE_COLOR value, *Color*, and returns a 6 character string of the form "RRGGBB".

StrToOLEColor(ColorStr) - This function takes a 6 character string of the form "RRGGBB" and returns a 4 byte OLE_COLOR value.

The following functions convert between RGB and HLS colour space values. RGB values are always expressed as a 6 character string.

RGBToHue(RGB) - This takes a RGB colour value as a string and returns the equivalent hue as a floating point value between 0 and 360.

RGBToLightness(RGB) - This takes a RGB colour value as a string and returns the equivalent lightness as a floating point value between 0 and 1.

RGBToSaturation(RGB) - This takes a RGB colour value as a string and returns the equivalent saturation as a floating point value between 0 and 1.

HLSToRGB(Hue, Lightness, Saturation) - This takes three H, L, S, parameters and returns the equivalent RGB colour value as a string. *Hue* is a floating point number between 0 and 360. *Lightness* and *Saturation* are floating point numbers between 0 and 1.

Invert - Converts the image to its negative by changing the colour of each pixel to the opposite colour, i.e., black is changed to white, white to black, etc.

3.2. Properties for Image Manipulation

The properties listed in this section can be used to control resampling of resized and rotated images.

Resample - Boolean. When true a resampling filter will be applied during an image resize or rotation. The filter used during resizing is specified by the *FilterType* property. When resampling is used the image will be converted to 24 bit colour.

For image resizing the quality is usually high enough when applied to 24 bit images and *Resample* does not need to be set. On the NT Server operating system the images can become grainy on resize and setting *Resample* to true will prevent this.

For rotations using an angle that is not a multiple of 90 degrees the image will develop some jagged edges and setting *Resample* can reduce this effect.

FilterType - Integer in the range 1 to 6. Determines the filter algorithm used when the image is resampled during a resize or scale operation (but not for rotations). This filter is also used when drawing shapes or lines with antialiasing or when *BlurText* is used with the *Text* method. The values for *FilterType* are 1 - Bilinear, 2 - Hermite, 3 - Bell, 4 - B-Spline, 6 - Mitchell. (Default = 1)

3.3. Restricting Image Manipulation to a Selected Area

Some of the image manipulation methods can be applied to a rectangular area instead of the whole image. This area is set using the *SetSelection* method and cleared with the *ClearSelection* method.

SetSelection *X1, Y1, X2, Y2* - (*X1, Y1*) and (*X2, Y2*) are integer coordinates measured from the top left of the current image and they specify opposite corners of a rectangle. When this method has been called, the image manipulation methods in the list below will be applied to this rectangular area only. This selection will remain until a new image is loaded or *ClearSelection* is called.

ClearSelection - This clears any selection rectangle and all future manipulations will apply to the entire image.

The methods to which the selection applies are: *Brightness, Contrast, ColorAdjust, HLSAdjust, Sharpen, SharpenBy, Blur, BlurBy* and *Invert*. Only 24 bit images will be affected because on low colour images adjustments are made to the palette, not the pixels.

The selection rectangle will also be used on any image exported using *BMPHandle*.

3.4. The Merge Methods and Properties

There are 6 methods available for combining the current image with a second image. *MergeFront* and *MergeBack* take the second image from a file stored on disk. *MergeFrontBin* and *MergeBackBin* take the second image as a binary data stream which can come from a database or an upload.

MergeFrontHDC and *MergeBackHDC* take the second image as a Windows handle which can come from another instance of the component. The "Front" methods make the current image the foreground and the "Back" methods make the current image the background.

The foreground image can be partially transparent by setting the *TransPercent* property. *TransPercent* is a percentage, taking a value between 0 and 100 where 0 is fully opaque and 100 is fully transparent (invisible). A single colour in the foreground can be fully transparent by setting the *Transparent* property to true and setting *TransparentColor* to the required colour. If the foreground image contains alpha transparency, this will be used in producing the composite image, in addition to the transparency options specified by *TransPercent* and *TransparentColor*. If both the foreground and background images contain alpha transparency the default behaviour will produce a composite image with no alpha transparency. To maintain alpha transparency set the *KeepAlpha* property to true.

For versions of *csImageFile* prior to 6.2, the property defining the transparent colour was *BGColor*. This property is still supported and can be used as an alternative name for *TransparentColor*.

The foreground image can be made to tile over the background by setting the *Tile* property to true. This ignores the *X* and *Y* coordinates and completely covers the background image. It would often be used with some transparency settings to create a watermark.

If the foreground image is 24 bit and the background image uses a palette the result will only contain the colours of the palette. This can be prevented by using the *MergeBack* method and using *ColorDepth* to change the palette image to 24 bit before merging. If the background image uses a palette, any foreground alpha transparency will be ignored.

If the foreground image specified in *MergeBack* and *MergeBackBin* contains transparency, this will be used during the merge and will overrule the settings of *Transparent* and *TransparentColor*.

MergeFront *Background, X, Y* - *Background* is the full physical path and filename for another image. The current image in memory is placed onto this background image. The top left corner is *X* and *Y* pixels across and down from the top left of the background image. *Background* is a string, *X* and *Y* are integers.

MergeBack *Foreground, X, Y* - *Foreground* is the full physical path and filename for another image. This foreground image is placed onto the current image. The top left corner is *X* and *Y* pixels across and down from the top left of the current image. *Foreground* is a string, *X* and *Y* are integers.

MergeFrontBin *BackgroundData, ImgType, X, Y* - This is the same as the *MergeFront* command except that it reads the background image from binary data. *BackgroundData* is a variant array containing another image (see also *ReadVariant*). The current image in memory is placed onto this background image. The top left corner is *X* and *Y* pixels across and down from the top left of the background image. *ImgType* is a string indicating the format of the background image and it must be one of "jpg", "gif", "bmp", "png", "psd", "pcx", "tif", "wbmp". Version 5 or later will also accept an empty string for *ImgType* and it will use the image if it is a supported format. *X* and *Y* are integers.

Example:

```
FileData = RS("ImageField")  
Image.MergeFrontBin FileData, "jpg", 25, 50
```

This places the current image onto another JPG image read from a database field. The top left corner of the current image will be at coordinates 25, 50 on the background image.

MergeBackBin *ForegroundData, ImgType, X, Y* - This is the same as the *MergeBack* method except it reads the foreground image from binary data. *ForegroundData* is a variant array containing another image (see also *ReadVariant*). This image is placed on top of the current image. The top left corner is *X* and *Y* pixels across and down from the top left of the current image. *ImgType* is a string indicating the format of the background image and it must be one of "jpg", "gif", "bmp", "png", "psd", "pcx", "tif", "wbmp". Version 5 or later will also accept an empty string for *ImgType* and it will use the image if it is a supported format. *X* and *Y* are integers.

MergeFrontHDC *BackgroundHandle, X, Y* - This is the same as the *MergeFront* method except that it reads the background image from a Windows bitmap handle. The current image is placed onto this background image. The top left corner is *X* and *Y* pixels across and down from the top left of the background image.

Example:

```
Image1.MergeFrontHDC Image2.BMPHandle, 25, 50
```

This places the image stored in the first instance of *csImageFile* (*Image1*) onto an image stored in a second instance of *csImageFile* (*Image2*). The top left corner of the first image will be at coordinates 25, 50 on the second image. Note that the resulting image is stored in *Image1* and the image in *Image2* is unchanged.

MergeBackHDC *ForegroundHandle, X, Y* - This is the same as the *MergeBack* method except that it reads the foreground image from a Windows bitmap handle. This image is placed on top of the current image. The top left corner is *X* and *Y* pixels across and down from the top left of the current image.

The following properties affect image merging.

TransPercent - Floating point number between 0 and 100. When images are merged this specifies the percentage transparency of the foreground image. By setting this to a high value a watermark is produced. The background image needs to be 24 bit colour for this to be effective.

Tile - Boolean. Used with the merge functions. When true the foreground image is tiled to fill the background and the coordinates are ignored. (Default = false)

3.5. Colour Palettes

Images that have a colour depth of 1 bit, 4 bit or 8 bit will use a palette or colour table. Only colours defined in the palette can be used in the image. When a colour is used that is not already in the palette, it will be added automatically if there is an unused entry in the palette. The following methods and properties can be used to find information about the palette and to set colour entries in the palette.

3.5.1. Palette Properties

PaletteEntry (*Index*) - String. The colour used by entry *Index* in the colour palette for the current image. The colour is a 6 digit hexadecimal string. *Index* is an integer between 0 and 255 and an error will be generated if a value outside this range is used. Images with 24 bit colour depths do not have a palette and *PaletteEntry* will always return "000000" in this case. For 1 bit and 4 bit images the palette contains 2 entries and 16 entries respectively. The higher entries are undefined but reading and writing them does not raise an error.

Example:

```
Image.PaletteEntry(0) = "FF0000"
```

This sets the first palette entry to red. Palette entries may be set before drawing on a low colour image, or they may be set to change a single colour within the image.

PaletteSize - Integer, read only. Returns the number of palette entries. This value can be found from the *ColorDepth* property because 1 bit, 4 bit and 8 bit images will have a *PaletteSize* of 2, 16 or 256. 24 bit images have a *PaletteSize* of 0.

3.5.2. Palette Methods

ColorIndex (*Colour*) - Returns the first index used by *Colour*, which is a 6 digit hexadecimal string. If the colour is not present in the palette the return value is -1.

FindUnusedColor - Returns the index of the first entry in the palette that is not used by any pixels. The return value is -1 if all the palette entries are used by pixels or if the image is 24 bit.

4. Drawing on the Image

Lines and shapes can be drawn on the image. Shapes and areas can be filled with a choice of simple fill patterns. The colour and thickness of lines is defined by the pen properties, *PenColor*, *PenThickness* and *PenStyle*. The fill colour and patterns are defined by the brush properties, *BrushColor* and *BrushStyle*. Individual pixels can be read or written to using the *Pixel* property. An image must be loaded, or created with *NewImage*, before any of these functions can be used.

All coordinate parameters are integers.

4.1. Methods for Drawing

Arc $X1, Y1, X2, Y2, X3, Y3, X4, Y4$ - Draws an elliptically curved line the colour of *PenColor*. The arc follows the perimeter of the ellipse bounded by $(X1, Y1)$ and $(X2, Y2)$, and moves anticlockwise from the start point to the end point. The start point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X3, Y3)$. The end point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X4, Y4)$.

Arc3XY $X1, Y1, X2, Y2, X3, Y3$ - Draws a an arc which traverses the perimeter of a circle between the points $(X1, Y1)$ and $(X2, Y2)$, passing through $(X3, Y3)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Chord $X1, Y1, X2, Y2, X3, Y3, X4, Y4$ - Draws a shape bounded by an arc and a line that joins the endpoints of the arc. The arc is an elliptically curved line that follows the perimeter of the ellipse bounded by $(X1, Y1)$ and $(X2, Y2)$, and moves anticlockwise from the start point to the end point. The start point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X3, Y3)$. The end point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X4, Y4)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Ellipse $X1, Y1, X2, Y2$ - Draws a circle or ellipse that fits into the rectangle defined by the top left corner $(X1, Y1)$ and the bottom right corner $(X2, Y2)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Circle3XY $X1, Y1, X2, Y2, X3, Y3$ - Draws a circle which passes through the points $(X1, Y1)$, $(X2, Y2)$ and $(X3, Y3)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

CircleCR X, Y, R - Draws a circle with centre (X, Y) and radius R . The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Pie $X1, Y1, X2, Y2, X3, Y3, X4, Y4$ - Draws a pie shaped wedge defined by an arc of an ellipse and lines joining the ends of the arc with the centre of the ellipse. The arc follows the perimeter of the ellipse bounded by $(X1, Y1)$ and $(X2, Y2)$, and moves anticlockwise from the start point to the end point. The start point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X3, Y3)$. The end point is defined by the intersection of the ellipse with a line drawn from the centre to the point $(X4, Y4)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Rectangle $X1, Y1, X2, Y2$ - Draws a rectangle defined by the top left corner $(X1, Y1)$ and the bottom right corner $(X2, Y2)$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

RoundRect $X1, Y1, X2, Y2, X3, Y3$ - Draws a rectangle defined by the top left corner $(X1, Y1)$ and the bottom right corner $(X2, Y2)$. The corners will be rounded with a curve matching an ellipse with width $X3$ and height $Y3$. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*.

Line *X1, Y1, X2, Y2* - Draws a line from point (*X1, Y1*) up to but not including the point (*X2, Y2*). The style, colour and width of the line are determined by the properties *PenStyle*, *PenColor* and *PenThickness*.

DrawLine *X1, Y1, X2, Y2* - Alternative name for the *Line* method for Visual Basic users.

FloodFill *X, Y* - Fills an area on the current image with *BrushColor* spreading outward from the point (*X, Y*) until a different colour is reached. All the pixels filled will have the same original colour as the pixel at (*X, Y*).

FillToBorder *X, Y, Color* - Fills an area on the current image with *BrushColor* spreading outward from the point (*X, Y*) until a boundary of *Color* is reached. *Color* must be a 6 character string representing the hexadecimal "RRGGBB" value.

For both *FloodFill* and *FillToBorder* the *BrushStyle* property must be changed from its default value of 1 (clear). Use 0 for solid.

PointAdd *X, Y* - Adds a point to use as a vertex by the *Polygon* method.

Polygon - Draws a polygon using the points added by *PointAdd* as vertices. The shape is filled using the pattern defined by *BrushStyle* and the colour defined by *BrushColor*. The points stored by *PointAdd* are cleared after the polygon is drawn.

BezierPointAdd *X, Y* - Adds a point to be used by the *PolyBezier* method.

PolyBezier - Draws a set of cubic *Bezier* curves using the points added by *BezierPointAdd*. The first curve is drawn from the first point to the fourth point, using the second and third points as control points. Each subsequent curve in the sequence requires exactly three more points. The ending point of the previous curve is used as the starting point, the next two points in the sequence are control points and the third is the ending point. The style, colour and width of the line are determined by the properties *PenStyle*, *PenColor* and *PenThickness*. The points stored by *BezierPointAdd* are cleared after calling *PolyBezier*.

SetBitmapBrush *Path* - Sets a bitmap to be the pattern used for filling shapes. The bitmap used is defined by *Path* which is the physical path and filename for the file. This will override the *BrushStyle* and *BrushColor* settings.

Example:

```
Image.SetBitmapBrush "C:\images\pattern.bmp"  
Image.Rectangle 10, 10, 50, 50
```

This will draw a rectangle and fill it with the image "pattern.bmp". If this is smaller than the rectangle it will be tiled.

SetBitmapBrushHandle *Handle* - Sets a bitmap to be the pattern used for filling shapes. The bitmap is defined by its Windows handle, *Handle*, which is an integer value. This could be used with the *BMPHandle* property to get the pattern from another instance of *csImageFile*. The *BrushStyle* and *BrushColor* properties are overridden.

ClearBitmapBrush - This removes any bitmap that was used as a fill pattern and reverts back to using *BrushStyle* and *BrushColor*.

Note that using a bitmap as the fill pattern will not work adequately for full colour pattern images unless the server is running in a full colour mode.






4.2. Properties for Drawing

The pen and brush properties are used to define the lines and filled shapes from the previous section.

PenColor - String. The colour used for drawing lines and the outlines of shapes. This is a 6 character string of the form "RRGGBB". (Default = "000000", black)


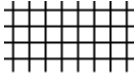

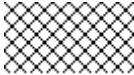

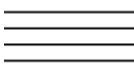


PenThickness - Integer. The width in pixels for lines and shape outlines. Line widths greater than one are only shown for solid pen styles. (Default = 1)

PenStyle - Integer in the range 0 to 5. This determines the pattern used to draw a line or shape outline. Use Clear (*PenStyle* = 5) when the outline is not required on filled shapes. (Default = 0, solid)

0, Solid		3, DashDot	
1, Dash		4, DashDotDot	
2, Dot		5, Clear	

BrushColor - String. The colour used for filling shapes when the *BrushStyle* is not clear. This is a 6 character string of the form "RRGGBB". (Default = "FFFFFF", white)

BrushStyle - Integer in the range 0 to 7. *BrushStyle* determines the pattern used when filling shapes. The fill pattern is the same colour as *BrushColor*. Use Clear (*BrushStyle* = 1) when no fill is required. (Default = 1, clear)

0, Solid		4, Cross	
1, Clear		5, DiagCross	
2, BDiagonal		6, Horizontal	
3, FDiagonal		7, Vertical	

The *Pixel* property allows access to read or set the colour of individual pixels.

Pixel(X, Y) - String. The colour of the pixel at (X, Y) as a 6 character hexadecimal string. X and Y are integers.

Example 1:

```
Image.Pixel(10, 10) = "000000"
```

This makes the pixel at (10, 10) black.

Example 2:

```
Image.TransparentColor = Image.Pixel(0,0)
```

This sets the *TransparentColor* property to the same colour as the pixel at the top left of the image.

Avoid filling large areas of an image by using *Pixel* in a loop because it is not particularly fast.

Antialias - Boolean. When true, text, lines or shapes drawn will be antialiased. (Default = false)

In the case of text it will only appear antialiased if the font is large enough or small enough to support it and if the image is 24 bit colour depth. If necessary the *ColorDepth* property should be set to 24 before drawing the text. If the computer running csImageFile has the display properties set to smooth screen fonts this will overrule the *Antialias* property and text will be antialiased even when the property is false. There is an alternative type of text antialiasing provided by the *BlurText* property, described in the next section.

For lines and shapes the exact appearance will be controlled by the value of the *FilterType* property and setting this to 3 or 4 will give a smoother appearance. Drawing an antialiased line or shape will automatically convert the image to 24 bit colour depth.

PixelArray (Row) - Variant array. This provides access to a complete row of pixels as an array of bytes. *Row* is measured from the top of the image where 0 is the top row and (*Height* - 1) is the bottom row. The exact format of the bytes will depend on the colour depth. For a 24 bit image there will be three bytes per pixel with the first being the blue component, the second the green and the third the red component. For an 8 bit image there will be one byte per pixel which represents the palette index. For a 4 bit image each byte represents the palette index for two pixels. For a 1 bit image, each byte represents 8 pixels. *PixelArray* is not easy to use in ASP as the language is not designed to work with arrays of bytes in this way. This property has been added by request.

BytesPerRow - Integer, read only. Used with *PixelArray* this property returns the number of bytes used by a row of pixels. It is the size of the variable returned by *PixelArray*.

5. Adding Text to an Image

Text can be placed on the current image using the *Text* method. Properties are available to control the font, style, size, colour and angle of rotation. Unicode characters can be used if the font supports them. Carriage returns can be placed in the string to allow the text to span multiple lines and there is a choice of justification options for this multi-line text.

Two methods of antialiasing are available. Setting the *Antialias* property to true enables Windows font smoothing. This requires the text to be above a certain size before antialiasing takes place, for example the Arial font does not antialias until the size is at least 18. Setting *BlurText* to true uses a resampling filter to blend the text with the background. This applies to all text sizes and fonts but the results are not as clear as when using the *Antialias* property. Either method should be avoided if the image is to be exported as a GIF with background transparency because the antialiased pixels are not the same colour as the background and are therefore visible.

Text *X, Y, TextString* - This places a string of text onto the image. The string is *TextString*, and the top left corner of the text is positioned at the point (*X, Y*). The text will break onto the next line if the string contains a carriage return, line feed or CRLF pair (in VBScript the constant `vbCRLF` can be used). Unicode characters will be displayed if the font specified by *TextFont* supports them. *X* and *Y* are integers, *TextString* is a string.

TextFont - String. The name of the font to be used. It defaults to the system font for the server and this font will be used if *TextFont* specifies an unavailable font. Note that if a font is installed on a remote server using Terminal Services, the server must be rebooted before `csImageFile` will be able to use the font. Use the *AddFont* method to temporarily install a font.

TextColor - String. The colour of the text as a 6 character string. (Default = "000000", black)

TextSize - Integer. The height of the text in pixels. (Default = 16)

TextBG - String. The colour of the text background as a 6 character string. (Default = "FFFFFF", white)

TextOpaque - Boolean. When true the text is drawn on a background the colour of *TextBG*. When false the background is transparent. (Default = true).

TextBold, TextItalic, TextUnderline, TextStrikeout - Boolean values to set text styles. All default to false.

TextAngle - Integer. The angle of rotation of the text, in degrees, measured anticlockwise from the horizontal. Only true type fonts can be drawn rotated. (Default = 0)

TextJustify - Integer, must be 0, 1 or 2. This applies to text spanning multiple lines and determines the justification. Text on a single line is not affected. The *X* parameter of the *Text* method always specifies the left position of the text string, even when text is right justified. 0 - Left, 1 - Centre, 2 - Right. (Default = 0, Left)

Text example:

```
Image.TextSize = 20
Image.TextBold = true
Image.TextFont = "Arial"
Image.TextOpaque = false
Image.Text 100, 50, "Some Text"
```

This sets the size and the font and sets the style to bold before drawing some text at coordinates (100, 50). *TextOpaque* is set to false so that the text background is transparent. Note that the text properties require an equals sign to assign a value but *Text* is a method and does not use an equals sign.

BlurText - Boolean. When true, a resampling filter is applied to the text to soften the edges. The filter used is determined by the *FilterType* property. It will overrule the *Antialias* property. This effect is identical to the antialiased text used by *csImageFile* before version 4.4. (Default = false)

FontNames - Collection. This returns a list of all the fonts installed on the server in alphabetical order. It is a collection and so it can be accessed using *For..Each*. *FontName.Count* returns the total number of fonts available, and *FontNames.Item(X)* returns the name of the font at position *X* in the list.

Example:

```
For Each Font in Image.FontNames
    Response.Write Font & "<br>"
Next
```

This will list all the fonts installed on the server.

The *TextHeight* and *TextWidth* functions return the height and width of a text string. This can be useful when positioning an item of text because the *X* and *Y* parameters of the *Text* method always set the top left corner of the text.

TextHeight(*Text*) - Integer return value. This returns the height in pixels if the string *Text* is to be drawn using the current font and size settings.

TextWidth(*Text*) - Integer return value. This returns the width in pixels if the string *Text* is to be drawn using the current font and size settings.

Text can be made to span multiple lines by adding carriage returns to the string in the *Text* method. Alternatively, text can be made to fit into a rectangle.

TextWrap - Boolean. When true the text will wrap onto multiple lines depending on the length and the values of the *TextRectX* and *TextRectY* properties. The line will only break at a space between characters and it will be justified as specified by the *TextJustify* property. (false)

TextRectX - Integer. When *TextWrap* is true *TextRectX* is the width of the rectangle containing the text, in pixels. If zero, the text will extend to the right of the image before wrapping to the next line. (Default = 0)

TextRectY - Integer. When *TextWrap* is true *TextRectY* is the height of the rectangle containing the text in pixels. If zero, the text will fill as many lines as required up to the height of the image. (Default = 0)

Text can be made partially transparent by setting the *TextTransPercent* property before drawing the text.

TextTransPercent - Integer in the range 0 to 100. This specifies an amount of transparency for text where 0 is completely opaque and 100 is invisible. Setting it to a high value makes the text appear as a watermark. The image must be 24 bit colour for this property to have any effect. (Default = 0)

Text can also be drawn along the path of an arc by using the *ArcText* method.

ArcText *X, Y, R, Angle, Text, Internal, Clockwise* - Draws the text string *Text* around the arc with centre at *X, Y* and radius *R*. The starting position for the text on the arc is given by the integer *Angle* which is the angle measured anticlockwise from a line extending to the right from the centre of the circle. *Internal* and *Clockwise* are both Boolean parameters. When *Internal* is true the top of the text will be aligned with the arc and when *Internal* is false the bottom of the text will be aligned with the arc. The *Clockwise* parameter specifies the direction of the text.

For best results, set *Antialias* to true before calling *ArcText* and use a font size that is large enough for this to take effect. The spacing of the characters will be comparable to the normal spacing for the current font. The background for the text will always be transparent.

5.1. Dynamically Installing a Font

If a font file is available on the server and its location is known, it can be installed temporarily by calling *AddFont*.

AddFont <i>FileName</i>	-	<i>FileName</i> is the physical path to the font file on the server. That font will become available to <i>csImageFile</i> even if it has not been installed.
--------------------------------	---	---

FreeAddedFonts	-	This will remove any fonts added by <i>AddFont</i> .
-----------------------	---	--

6. IPTC Text / File Info

The JPEG file format allows for additional data to be embedded in the file header and this is called meta data. One type of JPEG meta data is IPTC text (the initials stand for the International Press Telecommunications Council), which is a range of text fields that describe the image. `csImageFile` exposes each of these fields as properties for reading and writing. Adobe Photoshop supports some of these properties and refers to them as File Info and we have also used this terminology and our IPTC methods and properties are prefixed with "FFO_".

The *HasFileInfo* property indicates whether the current image contains File Info. It is set when an image is loaded. It is set to true if any FFO_ properties are written to, and set to clear if they are removed by calling the *FFO_Clear* or *ClearMetaData* methods.

The File Info properties can be read from or written to a separate file, either the older .FFO format or the newer XML based .XMP format.

Although IPTC text is most commonly used with JPEGs because it is aimed at digital photographs, the PSD and TIF formats also support it.

Version 6.3 of `csImageFile` extended IPTC support to the IPTC Core properties that are embedded inside files in the XMP data format. These properties are described later in this section. Their presence is indicated by the *HasXMP* property and they are cleared using the *XMPClear* method. These properties were only supported in JPEG files in version 6.3 but version 6.4 extended support to TIFF files and in January 2011 XMP support was extended to PSD files. Version 7.0 introduces support for "people tagging" as well as the tags used by Windows XP and the tag defining a rating for the image.

Many of the IPTC / File Info properties shown below are also stored inside the file in XMP format. If the values are different, the version used is determined by the value of the *XMPPriority* property. When this is true (the default) the XMP version is used.

6.1. IPTC / File Info Properties

HasFileInfo - Boolean. When an image is loaded that contains File Info this property is set to true. Setting any File Info property will set *HasFileInfo* to true. To remove the File Info from an image use the *FFO_Clear* method, which also sets *HasFileInfo* to false. (Default = false)

These properties are the IPTC / File Info fields.

FFO_Caption	-	String.
FFO_CaptionWriter	-	String.
FFO_Headline	-	String.
FFO_SpecialInstructions	-	String.
FFO_Category	-	String.
FFO_Byline	-	String.
FFO_BylineTitle	-	String.
FFO_Credit	-	String.
FFO_Source	-	String.
FFO_ObjectName	-	String.
FFO_City	-	String.
FFO_ProvinceState	-	String.
FFO_CountryName	-	String.
FFO_OTR	-	String. (Original Transmission Reference)
FFO_CopyrightNotice	-	String.
FFO_ImageURL	-	String.
FFO_Urgency	-	Integer in the range 0 - 7. Not saved/empty if set to 0.
FFO_DateCreated	-	Date.
FFO_CopyrightFlag	-	Boolean.

The following three properties are aliases of properties shown above. They reflect the fact that Adobe Photoshop 7 uses different property names from previous versions.

FFO_Title	-	String. Alias of <i>FFO_ObjectName</i> .
FFO_Author	-	String. Alias of <i>FFO_Byline</i> .
FFO_AuthorsPosition	-	String. Alias of <i>FFO_BylineTitle</i> .

Setting one property value also sets the corresponding alias property, so *FFO_Title* will always have the same value as *FFO_ObjectName*.

The following properties extend the copyright status to work with Adobe Photoshop 7 where three copyright states are possible, "Copyrighted Work", "Public Domain" and "Unmarked". *FFO_Marked* is stored in the XMP block and although it can be true or false, it can also be undefined (not present).

FFO_Marked	-	Boolean. Defaults to true.
FFO_MarkedDefined	-	Boolean. This determines whether the <i>FFO_Marked</i> property is defined in the file.

"Copyrighted Work" corresponds to *FFO_CopyrightFlag* = true or *FFO_Marked* = true.
 "Public Domain" corresponds to *FFO_Marked* = false and either value for *FFO_CopyrightFlag*.
 "Unmarked" corresponds to *FFO_CopyrightFlag* = false and *FFO_Marked* is undefined (*FFO_MarkedDefined* = false).

The Keywords and Supplemental Categories properties are zero based arrays of strings. Some additional properties and methods are needed to read and write them.

FFO_Keywords(<i>Index</i>)	-	String. The keyword defined by the integer <i>Index</i> .
FFO_KeywordsCount	-	Integer, read only. The number of items in the list.
FFO_KeywordsAdd <i>Keyword</i>	-	Adds the string <i>Keyword</i> to the end of the list. Returns the new number of items in the list as an integer.
FFO_KeywordsDelete <i>Index</i>	-	Deletes the keyword defined by the integer <i>Index</i> .
FFO_KeywordsInsert <i>Index, Keyword</i>	-	Inserts the string <i>Keyword</i> at position <i>Index</i> in the list. <i>Index</i> is an integer.
FFO_KeywordsClear	-	Deletes all the keywords.
FFO_SuppCat(<i>Index</i>)	-	String. The category defined by the integer <i>Index</i> .
FFO_SuppCatCount	-	Integer, read only. The number of items in the list.
FFO_SuppCatAdd <i>Cat</i>	-	Adds the string <i>Cat</i> to the end of the list. Returns the new number of items in the list as an integer.
FFO_SuppCatDelete <i>Index</i>	-	Deletes the category defined by the integer <i>Index</i> .
FFO_SuppCatInsert <i>Index, Cat</i>	-	Inserts the string <i>Cat</i> at position <i>Index</i> in the list. <i>Index</i> is an integer.
FFO_SuppCatClear	-	Deletes all the categories.

Version 4.3 of csImageFile introduced support for more IPTC fields. These are shown separately as fewer software packages support these fields.

FFO_EditStatus	-	String.
FFO_FixtureIdentifier	-	String.
FFO_DateReleased	-	Date.
FFO_TimeReleased	-	Date.
FFO_ReferenceService	-	String.
FFO_ReferenceDate	-	Date.
FFO_ReferenceNumber	-	String.
FFO_TimeCreated	-	Date.
FFO_OriginatingProgram	-	String.
FFO_ProgramVersion	-	String.

FFO_ObjectCycle	-	String.
FFO_Sublocation	-	String.
FFO_CountryCode	-	String.
FFO_LocalCaption	-	String.
FFO_CustomField1	-	String.
FFO_CustomField2	-	String.
There are 20 custom fields in total.		
FFO_CustomField19	-	String.
FFO_CustomField20	-	String.
FFO_ImageNotes	-	String.

6.2. IPTC Core Properties (XMP)

Version 6.3 of csImageFile introduced support for the following properties, which are defined by the IPTC Core Schema for XMP. Some care should be taken when using them because it is a more recent standard and not all software with IPTC support will support these properties.

FFO_CiAdrExtAdr	-	String. Extra address field for creator contact info.
FFO_CiAdrCity	-	String. City field for creator contact info.
FFO_CiAdrRegion	-	String. Region field for creator contact info.
FFO_CiAdrCtry	-	String. Country field for creator contact info.
FFO_CiAdrPcode	-	String. Postal code field for creator contact info.
FFO_CiTelWork	-	String. Creator contact telephone number.
FFO_CiEmailWork	-	String. Creator contact email address.
FFO_CiUriWork	-	String. Creator contact URL.
FFO_HasContactInfo	-	Boolean, read only. This property is true if any of the above creator contact fields are present.
FFO_IntellectualGenre	-	String.
FFO_RightsUsageTerms	-	String.

The Scene and SubjectCode properties are zero based arrays of strings. Some additional properties and methods are needed to read and write them.

FFO_Scene(<i>Index</i>)	-	String. The scene defined by the integer <i>Index</i> .
FFO_SceneCount	-	Integer, read only. The number of items in the list.
FFO_SceneAdd <i>Scene</i>	-	Adds the string <i>Scene</i> to the end of the list. Returns the new number of items in the list as an integer.
FFO_SceneDelete <i>Index</i>	-	Deletes the scene defined by the integer <i>Index</i> .
FFO_SceneInsert <i>Index, Scene</i>	-	Inserts the string <i>Scene</i> at position <i>Index</i> in the list. <i>Index</i> is an integer.
FFO_SceneClear	-	Deletes all the items in the list.
FFO_SubjectCode(<i>Index</i>)	-	String. The subject code defined by the integer <i>Index</i> .
FFO_SubjectCodeCount	-	Integer, read only. The number of items in the list.
FFO_SubjectCodeAdd <i>Code</i>	-	Adds the string <i>Code</i> to the end of the list. Returns the new number of items in the list as an integer.
FFO_SubjectCodeDelete <i>Index</i>	-	Deletes the subject code defined by the integer <i>Index</i> .
FFO_SubjectCodeInsert <i>Index, Code</i>	-	Inserts the string <i>Code</i> at position <i>Index</i> in the list. <i>Index</i> is an integer.
FFO_SubjectCodeClear	-	Deletes all the items in the list.

Many of the properties defined in the IPTC Core are duplicates of existing IPTC properties, for example Description (*FFO_Caption*), City (*FFO_City*) and the keywords. These duplicate properties can be accessed through the properties described in section 6.1 above. There are many other properties stored in the XMP data block which are not supported by csImageFile.

The following properties are used to manage the XMP data.

HasXMP	-	Boolean, read only. This is set to true when XMP properties are present.
KeepXMP	-	Boolean. When this is true, XMP data will be saved with a JPEG or TIFF file. Set this property to false to prevent the data from being saved. (Default = true)
XMPPriority	-	Boolean. If the same property is stored as both IPTC/IIMV4 and XMP inside a JPG or TIFF, <i>XMPPriority</i> determines which version is used when the image is loaded. When true, the XMP version will be used. This only applies to reading images and <i>csImageFile</i> will use the same value for both formats when writing. (Default = true)

6.3. IPTC / File Info Methods

FFO_Clear	-	Deletes all IPTC / File Info values and sets <i>HasFileInfo</i> to false.
FFO_Save <i>FileName</i>	-	Writes the File Info data to a file. <i>FileName</i> is the physical path and file name, complete with extension. The extension must be either .ffo or .xmp and this determines the format used. <i>FileName</i> is a string.
FFO_Load <i>FileName</i>	-	Loads File Info data from a file. <i>FileName</i> is the physical path and file name, complete with extension. The file must be either FFO or XMP format. <i>FileName</i> is a string.
OverwriteMetaData <i>FileName</i>	-	This writes the File Info and Exif data of the current image to the JPG file specified by <i>FileName</i> . It leaves the image part of <i>FileName</i> unchanged and so prevents the loss caused by recompressing the image. It must only be used if <i>FileName</i> is a JPG file. For TIF and PSD files, save the file using <i>WriteFile</i> . <i>FileName</i> is a string.

Example:

```
Image.ReadFile "C:\directory\image.jpg"
Image.FFO_Caption = "New Caption"
Image.OverwriteMetaData "C:\directory\image.jpg"
```

This will change the Caption property of the image and modify it on disk without changing the image data. It will lose any meta data that is not supported by *csImageFile*.

OverwriteMetaDataBin *FileData* - Variant array return value. This writes the File Info and Exif data of the current image to the JPG file *FileData*, which is a variant array. The resulting file is returned as a variant array. As with *OverwriteMetaData* it leaves the image part of the input file unchanged to prevent loss on recompression. It can be used when JPG images are stored in binary fields in databases.

Example:

```
Temp = RS("ImageData")
RS("ImageData") = Image.OverwriteMetaDataBin(Temp)
```

This assumes that RS is an open recordset, ImageData is a binary data field containing an image in JPG format and Image is an instance of *csImageFile* which contains some meta data. It will write the meta data to the image and write it back to the recordset. Note that *csImageFile* cannot read an image directly from the recordset and it is written into a temporary VBScript variable first.

ReadMetaData *FileName* - This loads the File Info and Exif data from the JPG, TIF or PSD file specified by *FileName* into the *csImageFile* object, without loading the image itself. Any image already loaded will remain unchanged except for the meta data and the DPI property.

XMPClear - This clears any data stored in the XMP block.

ClearMetaData - This clears all the meta data from the image, and is the equivalent of calling *FFO_Clear*, *XMPClear* and *ExifClear*.

6.4. People Tagging

People can be "tagged" in an image using meta data as specified in the Microsoft Photo Schema and this method is used by Windows Live. The names of one or more people can be written to the image meta data and each name can optionally include the specification of a rectangle within that image. The following methods and properties allow this meta data to be read and edited.

6.4.1. People Tagging Methods

AddXMPPersonTag (<i>Name</i>)	-	Integer return value. This adds a new person tag called <i>Name</i> , which is a string. The return value is the index of this tag, which is needed to read or edit the tag in the future.
DeleteXMPPersonTag (<i>Index</i>)	-	Deletes the person tags specified by <i>Index</i> . The first tag has an <i>Index</i> of zero.
ClearXMPPersonTags	-	Removes all person tags from the image.
SetXMPPRectangle <i>Index, X, Y, Width, Height</i>	-	Creates a rectangle for the person tag specified by <i>Index</i> . <i>X</i> and <i>Y</i> is the position of the top left corner of the rectangle and the size is given by <i>Width</i> and <i>Height</i> . The dimensions are floating point values between zero and one and they are fractions of the width and height of the image. This is how the values are stored inside the file.
SetXMPPRectanglePX <i>Index, X, Y, Width, Height</i>	-	Creates a rectangle for the person tag specified by <i>Index</i> . <i>X</i> and <i>Y</i> is the position of the top left corner of the rectangle and the size is given by <i>Width</i> and <i>Height</i> . The dimensions are pixels and are integer values.

6.4.2. People Tagging Properties

All the people tagging meta data properties are stored in a zero based array, specified with an index.

XMPPersonTagCount	-	Integer, read only. The number of person tags in the image.
XMPPersonTag (<i>Index</i>)	-	String. The name of the person. This property can be set to change the name of an existing tag but use <i>AddXMPPersonTag</i> to add a new tag.
XMPPRectangleX (<i>Index</i>)	-	Integer, read only. The x-coordinate of the top left of the rectangle specified by <i>Index</i> . This is measured in pixels.
XMPPRectangleY (<i>Index</i>)	-	Integer, read only. The y-coordinate of the top left of the rectangle specified by <i>Index</i> . This is measured in pixels.
XMPPRectangleWidth (<i>Index</i>)	-	Integer, read only. The width of the rectangle specified by <i>Index</i> . This is measured in pixels.
XMPPRectangleHeight (<i>Index</i>)	-	Integer, read only. The height of the rectangle specified by <i>Index</i> . This is measured in pixels.
To set the coordinates of a rectangle, use <i>SetXMPPRectangle</i> or <i>SetXMPPRectanglePX</i> .		
XMPPersonEmailDigest (<i>Index</i>)	-	String. This is used by Windows Live and is the hash of an email address. It is not an actual email address.
XMPPersonLiveIDCID (<i>Index</i>)	-	String. The decimal representation of a Windows Live CID.

The above two properties cannot be used directly but are included to allow the contents of an existing image file to be copied.

The people tagging properties are XMP and are cleared by *XMPClear* and are used with the properties *HasXMP* and *KeepXMP*.

6.5. Other XMP Properties – Rating and Rating Percent

Two other meta data properties are supported and these come under the category of XMP. The property names have the prefix FFO_ like the IPTC properties described above although they are not part of the IPTC specification.

FFO_Rating - Integer. This is the rating that is recognised in Windows 7 and Vista and is usually shown as a number of stars. It should have a value between 1 and 5. If it is zero it is null and will not be stored.

FFO_RatingPercent - Integer. This is part of the Microsoft Photo Schema and should have a value between 1 and 100. If it is zero it is null and will not be stored.

Note that *csImageFile* does not verify the range of values when either *FFO_Rating* or *FFO_RatingPercent* are set, so it is possible to give them unsuitable values. They are cleared by setting them to zero and are also cleared when *XMPClear* is called.

7. EXIF Attributes

Another form of meta data that can be stored inside JPEG files are EXIF attributes (Exchangeable Image File Format). These are typically recorded by a digital camera at the time the image is created and many of them describe the camera and its configuration. `csImageFile` will preserve this data when a JPG image is saved, unless it is specifically cleared by calling the *ExifClear* method.

The Exif attributes (or tags) can be read, written or deleted using `csImageFile`. As there are over 100 different attributes we have not provided a property for each, in the way we have with IPTC text. Instead the attributes are held in an indexed array as strings. Each attribute can be accessed by its index in this array, or by name. Attributes can be written using the attribute name, which is not case sensitive.

`csImageFile` supports reading and writing Exif attributes with JPEG and TIFF files.

7.1. Reading Exif Attributes

ExifValueByIndex(*Index*) - Returns the value of the Exif attribute as a string given the index within the array. *Index* is an integer.

ExifValueByName(*Name*) - Returns the value of the Exif attribute as a string given the name of the attribute. *Name* is a string.

ExifName(*Index*) - Returns the name of the Exif attribute as a string given the index within the array. *Index* is an integer.

ExifCount - Integer property, read only. The number of Exif attributes.

ExifClear - This method clears all the Exif attributes. After calling *ExifClear* any JPG saved will have no Exif attributes.

Example:

```
Set Image = Server.CreateObject("csImageFileTrial.Manage")
Image.ReadFile "C:\path\to\image.jpg"
For I = 0 to Image.ExifCount - 1
    Response.Write Image.ExifName(I) & ": " & Image.ExifValueByIndex(I)
    Response.Write "<br>"
Next
```

This uses the trial version of `csImageFile` to list all the Exif attributes stored in the image.

ExifConvertUTF8 - Boolean property. When true, UTF-8 encoded characters in strings will be automatically converted on reading and writing. (Default = true)

7.2. Writing Exif Attributes

Individual Exif attributes can be written or deleted. They are always specified by the name of the attribute.

ExifSetAttribute *Name*, *Value* - Boolean return value. The Exif attribute *Name* is set to *Value*. *Name* and *Value* are both strings. If the attribute is set successfully the return value is true, otherwise it is false. If the name is invalid or if the value is not in the correct format the attribute will not be set.

ExifDelete *Name* - Boolean return value. The Exif attribute *Name* is deleted. *Name* is a string. If the deletion is successful the return value will be true. If *Name* is not a valid attribute name the return value will be false.

7.3. Exif Data Types

Each Exif attribute is stored as one of the data types listed below.

- BYTE - An 8 bit unsigned integer.
- ASCII - An ASCII character.
- SHORT - A 16 bit (2 byte) unsigned integer.
- LONG - A 32 bit (4 byte) unsigned integer.
- RATIONAL - Two LONGs. The first is the numerator and the second is the denominator. The *RationalToReal* function can convert one of these values to a real number. The *ExifSetAttribute* function can accept either a real number or a rational number, in string format. So "3/2" and "1.5" would both be accepted by *ExifSetAttribute*.
- UNDEFINED - An 8 bit byte that can take any meaning depending on the field definition. This will be returned as a 2 character string of the hexadecimal byte value. Where multiple values are stored in the same attribute they are returned as a comma separated string. The *ExifVersion* attribute would return "30,32,32,30" for Exif 2.2. The *ExifVersion* attribute is defined to contain 4 bytes and each byte represents an ASCII character, so the bytes shown here translate to "0220". Other "Undefined" attributes will have different meanings and will not necessarily represent ASCII characters.
- SLONG - A 32 bit (4 byte) signed integer.
- SRATIONAL - Two SLONGs. The first is the numerator and the second the denominator.

Date and time attributes are stored as strings in the format "YYYY:MM:DD HH:MM:SS". The *ExifStringToDate* and *ExifDateToString* functions can convert between this string format and the date/time format used by ActiveX components.

7.4. Exif Helper Functions

The following functions convert data from values stored in the Exif attributes into more usable forms, or convert data into a string value for use with the *ExifSetAttribute* method.

<p>RationalToReal(<i>Value</i>) - <i>Value</i> is a string of the form "A/B" where A and B are integers and it returns a real number. It is used for converting a value stored as RATIONAL or SRATIONAL into a real number for further processing.</p> <p>ExifStringToDate(<i>Value</i>) - <i>Value</i> is a string containing a date/time of the form "YYYY:MM:DD HH:MM:SS", which is how date/time Exif attributes are stored. The return value is in the format of an ActiveX date/time variable. If <i>Value</i> is not in the correct format the return value will be zero. It will not generate an error.</p> <p>ExifDateToString(<i>Value</i>) - <i>Value</i> is an ActiveX date/time and the return value is the date and time in the form "YYYY:MM:DD HH:MM:SS". This can be used for converting a date/time into a string that can be used by the <i>ExifSetAttribute</i> function.</p>
--

The following functions return information about the Exif attributes. This information can be found in the Exif specification but these functions can provide a useful reference and also clarify the values that csImageFile uses.

<p>ExifAttributeName(<i>Tag</i>) - <i>Tag</i> is the 2 byte integer ID for the attribute. The return value is the string value of the attribute name as it is used by the other functions in this section.</p>

ExifDataType(*Name*) - This returns the Exif data type for the *Name* attribute. Possible return values are 1 - BYTE, 2 - ASCII, 3 - SHORT, 4 - LONG, 5 - RATIONAL, 7 - UNDEFINED, 9 - SLONG, 10 - SRATIONAL. *Name* is a string, the return value is an integer.

ExifDataCount(*Name*) - This returns the size of the *Name* attribute. It is the number of data items, not the number of bytes occupied. For ASCII and UNDEFINED data types of variable length this value is zero. *Name* is a string.

The UserComment attribute is stored using the UNDEFINED data type so it is returned as a comma separated string of hexadecimal values. It is really a string preceded by a header which identifies the format as ANSI or Unicode. To allow easy reading and writing of this attribute the *ExifUserComment* property is provided.

ExifUserComment - String property. The value of the Exif UserComment attribute, which may optionally contain Unicode characters.

7.5. EXIF Thumbnails

In JPG images a smaller copy of the image, or thumbnail, can be stored with the EXIF data. *csImageFile* does not store this by default but this behaviour can be controlled by setting the *KeepExifThumbnail* property.

KeepExifThumbnail - Boolean property. When true, JPG images will be saved with a thumbnail inside the EXIF data block. The *OverwriteMetaData* method will preserve any EXIF thumbnail while replacing the metadata. The thumbnail will only be stored if the image contains at least one EXIF property. (Default = false)

7.6. XP Summary Information

Windows XP allows some JPG meta data to be edited through Windows Explorer by selecting file properties. This data is stored with the Exif data although it is not stored using the recognised Exif standard. Five additional properties allow this data to be accessed with *csImageFile*.

XP_Title	-	String.
XP_Comments	-	String.
XP_Keywords	-	String.
XP_Author	-	String.
XP_Subject	-	String.

These values also appear in the list of Exif attributes and are cleared by calling *ExifClear*. It is difficult to read and write them correctly because they do not obey the Exif specification so it is recommended to use the properties provided.

These properties are also supported in Windows Vista but some of the properties set in Windows Vista are stored as XMP and will appear as IPTC (File Info) properties when read using *csImageFile*. In Windows Vista, TIFF images can have these properties inserted through Windows Explorer.

7.7. Trailing Meta Data

It has come to our attention that some meta data editing software incorrectly stores meta data at the end of JPG images. This results in the same software being unable to read changes made using our

OverwriteMetaData method, as it inserts the meta data into the header and leaves the rest of the file untouched. We have introduced a method to remove this data from the end of JPG files.

DeleteTrailingData(FileName) - *FileName* is the physical path to a JPG file and is a string. Calling this method will remove any bytes from the file that are after the end of image marker.

DeleteTrailingDataBin(FileData) - *FileData* is a variant array containing a JPG image. The method has a return value which is also a variant array and it is the same JPG image but with the bytes after the end of image marker removed.

Example:

```
FileData = Image.DeleteTrailingDataBin(Upload.FileData(0))  
Recordset("ImageDB") = FileData
```

This example shows how *DeleteTrailingDataBin* could be used with our csASPUpload component to remove the extra bytes from the end of a JPG file during a file upload and before saving to a database. If the file was to be saved on disk it would be easier to save the file first and then use *DeleteTrailingData*.

These two methods should not be needed under normal circumstances. They are provided to deal with a known issue caused by some meta data editing software when the images are edited using *OverwriteMetaData*.

8. Embedded Colour Profiles

JPEG images can contain information that defines how the colours should appear when displayed. A system that is frequently used is defined by the International Color Consortium (ICC) and `csImageFile` can preserve this information when editing JPEG and TIFF images. A description of colour profiles and colour management is beyond the scope of these instructions.

The default behaviour of `csImageFile` is to discard the colour profile on opening a JPEG or TIFF. To overrule this, set the `KeepICCProfile` property to true before loading the image. If the current image contains an ICC colour profile, the `HasICCProfile` property will be set to true. An existing profile can be removed by calling the `ClearICCProfile` method.

The support for ICC profiles is limited to preserving or discarding existing information. There is no functionality to read information about the profile or to edit it in any way.

KeepICCProfile	-	Boolean. This property determines whether an embedded ICC colour profile will be stored when opening a JPEG or TIFF image. This property must be set to true to save an existing profile with a JPEG or TIFF image. (default = false)
HasICCProfile	-	Boolean, read only. This property indicates whether the current image contains an ICC colour profile. It will only return true if <code>KeepICCProfile</code> has been set before loading the image.
ClearICCProfile	-	This method clears an ICC colour profile from the current image.

9. Alpha Transparency and PNG Images

Some PNG images contain an "alpha channel" which describes a level of transparency for each individual pixel. `csImageFile` can extract this when a PNG image is loaded. If the image is saved again in PNG format, this alpha channel will be saved as part of the image.

The alpha channel will be preserved if the image is resized, cropped, rotated or flipped. Other edits will cause the alpha channel to be discarded unless the *KeepAlpha* property is first set to true. Before discarding any alpha channel the image will be merged with the background.

A PNG image can specify a background colour. This is to be shown behind transparent pixels if the viewer is unable to show whatever is behind the image. `csImageFile` will merge a PNG containing an alpha channel with this background when the image is exported to another format, or when the alpha channel is removed due to editing as described above. If no background colour is specified, white will be used by default.

The following properties are related to alpha transparency and background colours.

HasAlpha	-	Boolean, read only. This is set to true if the image currently loaded contains an alpha channel. Use <code>ClearAlpha</code> to remove an alpha channel.
KeepAlpha	-	Boolean. When true, edits applied to the image will not remove the alpha channel. This property is also used to maintain the background alpha channel when two images with alpha channels are merged. (Default = false)
BackgroundColor	-	String. The colour of the background that will be shown behind transparent pixels when an image containing an alpha channel is exported. (Default = "FFFFFF", white)
HasBackground	-	Boolean. This determines whether the current image contains a background colour which will be stored when the image is exported in PNG format. (Default = false)
ExtraAlphaValue	-	Integer in the range 0 - 255. When an image containing an alpha channel is rotated by an angle that is not a multiple of 90 degrees, or cropped to coordinates that make the image bigger, the new area created will have an alpha value specified by this property. 0 is fully transparent and 255 is fully opaque. (Default = 0)
AlphaPixel (X, Y)	-	Integer in the range 0 – 255. This property allows the alpha value of a specified pixel to be read or written.

The following methods are related to alpha transparency and background colours.

ClearAlpha	-	This removes any alpha channel from the current image without merging it with the background.
NewAlpha Value	-	This creates an alpha channel for the current image and sets the value for each pixel to <i>Value</i> , which is an integer between 0 and 255 where 0 is fully transparent and 255 is fully opaque. This will convert the image to 24 bit colour if it is not already.
CombineAlphaWithBG	-	This combines the image with the background colour, if it contains an alpha channel. The alpha channel is then removed.
AlphaText (X, Y, TextOut)	-	This draws antialiased text on an image with an alpha channel. <i>X</i> and <i>Y</i> are the coordinates of the text and <i>TextOut</i> is the text string. It uses the same properties for controlling the font, size and colour as the <i>Text</i> command in Section 5. An exception will be raised if there is no alpha channel in the current image.

PNG images containing a colour palette (colour images that are 8 bit or less) can specify a variable amount of transparency for each palette entry. This information is also preserved when loading and

saving, but it is removed when the image is edited, except for resize, crop, rotate and flip operations. These images will not be merged with a background when exported or edited, but the transparency is used in merge functions. `csImageFile` cannot edit this type of transparency information except for the simple case where only one colour is fully transparent.

9.1. Editing the Alpha Channel

There is some very limited support for editing the alpha channel, but this includes the ability to import and export the alpha channel as a greyscale bitmap. It is possible to export an alpha channel to another instance of `csImageFile`, edit it, and then import it again. In this greyscale bitmap a white pixel represents fully opaque and a black pixel represents fully transparent.

The following methods load and save the alpha channel as a bitmap.

SaveAlphaAsBMP *FileName* - If the current image contains an alpha channel this will save it as a greyscale bitmap. Full transparency is shown as black and full opacity is shown as white. *FileName* is the physical path to the saved file and it should have the extension `.bmp`. If no alpha channel is present in the image an exception will be raised.

LoadAlphaAsBMP *FileName* - This will load an alpha channel into the current image where *FileName* is the physical path to a greyscale bitmap file. This bitmap must be exactly the same width and height as the current image or an exception will be raised.

The alpha channel can also be loaded and saved as a greyscale bitmap directly from memory as a Windows handle.

AlphaHDC - Integer. This property gives access to the bitmap handle of the alpha channel. It can be used for import and export. It is compatible with the *BMPHandle* property so it can be used to pass an alpha channel between instances of `csImageFile` so it can be edited using the full range of component methods and properties. Importing an alpha channel with *AlphaHDC* will raise an exception if the imported image is not exactly the same dimensions as the current image.

Example:

```
Set MainImage = Server.CreateObject("csImageFile.Manage")
Set Alpha = Server.CreateObject("csImageFile.Manage")
```

```
MainImage.ReadFile "c:\images\test.jpg"
```

```
MainImage.NewAlpha 255
Alpha.BMPHandle = MainImage.AlphaHDC
Alpha.PenColor = "808080"
Alpha.BrushColor = "808080"
Alpha.BrushStyle = 0
Alpha.Rectangle 10, 10, 200, 200
MainImage.AlphaHDC = Alpha.BMPHandle
```

```
Response.ContentType = "image/png"
Response.BinaryWrite MainImage.PNGData
```

This example shows how to use a second instance of `csImageFile` to edit an alpha channel. An image is loaded from disk and an alpha channel created using *NewAlpha*. The alpha channel is passed to the second component instance using *AlphaHDC* where a filled rectangle is drawn in a mid grey colour. This is passed back as the new alpha channel where it will show as a partially transparent rectangle.

Note that the background colour is not passed with the alpha channel and the *BackgroundColor* property must be set unless the default white colour is to be used.

10. Streaming an Image to the Browser

An active server page will return HTML output by default. An HTML page is formatted text which can include spaces to display images. The images themselves are not part of the HTML but are separate files, the location of which is specified inside the tag. An ASP page can be an image if the ContentType is set to "image/gif" or "image/jpeg" and the binary data of the image is output using the Response.BinaryWrite command. The ASP image is generated by placing the path to the script inside the tag.

For example, this page will display the image produced by "resize.asp":

```
<html>
<head><title>HTML page containing an image</title></head>
<body>

</body>
</html>
```

Resize.asp may look like this:

```
<%@ language=vbscript %>
<%
    Response.Expires = 0
    Response.Buffer = true
    Response.Clear
    Set Image = Server.CreateObject("csImageFile.Manage")
    Image.ReadFile "c:\images\bigimage.jpg"
    Image.Scale 25
    Response.ContentType = "image/jpeg"
    Response.BinaryWrite Image.JPGData
%>
```

When the first HTML page is loaded it looks for the image at "resize.asp", runs the script and is sent a stream of binary data in JPG format, so the browser displays the image. It is not possible to place the BinaryWrite command inside the IMG tag to produce the image, it must be in a separate file.

If the line setting the ContentType is missing the image should still display in Internet Explorer but it might not in other browsers. It is important to specify the correct ContentType to maintain compatibility.

It is useful to know that parameters can be passed to the ASP image script using the URL string and this can be read using Request.QueryString and used somewhere in the script.

Example:

```

```

This can be used by resize.asp:

```
Image.Resize Request.QueryString("NewSize"), 0
```

11. Language Specific Issues

All the examples that are shown so far in these instructions use ASP and VBScript. The `csImageFile` component is a COM object and can be used in most COM enabled environments running on a Windows platform. We cannot begin to cover all the possible development environments here so instead we concentrate on ASP and in this section we show the syntax for Cold Fusion, Visual Basic and ASP.NET.

11.1. Active Server Pages

ASP and VBScript is already covered in these instructions but the following points are worth noting.

Calls to methods (functions) do not use brackets, although their use does not generate an error if there is only one parameter. For example the correct syntax for *Resize* is:

```
Image.Resize 200, 0
```

These instructions show methods without brackets surrounding the parameters, unless that method has a return value.

If the method has a return value that is assigned to another variable, the brackets are required. For example:

```
Success = Image.ExifSetAttribute("ImageDescription", "New  
description")
```

If the return value is not assigned, the brackets will give an error.

Assigning a property value requires an equals sign. Missing the equals sign results in the unhelpful error "Object doesn't support this property or method". The correct syntax is:

```
Image.JpegQuality = 70
```

A lot of ASP syntax errors are caused by adding brackets when they are not required, or missing them when they are required, missing equals signs when assigning a property, or accidentally including an equals sign in a method call.

11.1.1. ASP with Javascript

We don't provide any examples of using ASP with other scripting languages, other than VBScript. We will mention the following about using Javascript with ASP.

Brackets are needed around function parameters.

The backslash character is used as an escape character in Javascript and two should be used together when a backslash is needed:

```
Image.WriteFile("C:\\output\\newimage.gif");
```

11.2. Cold Fusion

In Cold Fusion, a COM object is created using the `<cfobject>` tag:

```
<cfobject action="create" name="Image" class="csImageFile.Manage">
```

Each command must be placed inside a <cfset> tag and all method parameters must be enclosed by brackets:

```
<cfset Image.ReadFile("c:\images\bigimage.jpg")>
<cfset Image.Scale(20)>
<cfset Image.WriteFile("c:\images\smallimage.jpg")>
```

Alternatively, the commands can be put inside a <cfscript> block:

```
<cfscript>
Image.ReadFile("c:\images\bigimage.jpg");
Image.Scale(20);
Image.WriteFile("c:\images\smallimage.jpg");
</cfscript>
```

Cold Fusion version 5 does not support variant arrays and so commands such as *GIFData*, *JPGData* and *ReadVariant* cannot be used. Without these commands, images cannot be streamed directly to the browser so any dynamically produced image must be saved to a temporary file first and then displayed using a <cfcontent> tag.

It is possible to stream images using Cold Fusion MX without saving to a temporary file first. The following commands will stream an image in jpeg format assuming an image is loaded into a csImageFile object called "Image".

```
<cfscript>
Context = GetPageContext();
Context.SetFlushOutput(false);
Response = Context.GetResponse().GetResponse();
Out = Response.GetOutputStream();
Response.SetContentType("image/jpeg");
Out.Write(Image.JPGData);
Out.Flush();
Response.Reset();
Out.Close();
</cfscript>
```

For more on using csImageFile with Cold Fusion visit www.chestysoft.com/imagefile/cf.htm.

11.3. Visual Basic

For best results import the csImageFile type library into VB by selecting "Project" from the menu bar, then "References". The dialogue box will then show available type libraries. Scroll down to "csImageFile Library", check the box and click OK. This will add the "Manage" class from csImageFile to the Object Browser, making it available for early binding.

To create an instance of the object called "Image" use the following code:

```
Dim Image As Manage
Set Image = CreateObject("csImageFile.Manage")
```

Displaying an image from csImageFile in a VB picture box is not simple as it involves an API call to create a bitmap. There is a description of this and some sample code on our web site at: www.chestysoft.com/imagefile/vbimage.asp

We have an OCX control called csXImage which is much more suited for use with Visual Basic:
www.chestysoft.com/ximage/default.asp

11.4. ASP.NET

csImageFile can be used with ASP.NET. The component must be registered on the server as described earlier and it can be called using Server.CreateObject. For example:

```
Dim Image = Server.CreateObject("csImageFile.Manage")
```

The object is created using Dim instead of Set. For the trial version the class name is "csImageFileTrial.Manage".

The image cannot be streamed to the browser in a single line because of incompatibilities between ActiveX and .NET, but there is a workaround which we describe in the VB.NET example below.

```
<%@ Page language="vb" debug="true" %>
<%
Response.Expires = 0
Response.Buffer = true
Response.Clear

Dim Image = Server.CreateObject("csImageFile.Manage")
Image.NewImage(150, 50, "00ff00")
Image.TextOpaque = false
Image.TextSize = 22
Image.Text(5, 10, "Sample image")
Dim OutArray As Array = Image.GIFData
Dim ByteArray(OutArray.Length - 1) As Byte
Array.Copy(OutArray, ByteArray, OutArray.Length)
Response.ContentType = "image/gif"
Response.BinaryWrite(ByteArray)
%>
```

This creates a new image and draws some text onto it. In order to stream it to the browser the output from the *GIFData* property needs to be passed to an array of bytes so that it can be sent out through BinaryWrite. Brackets are used to enclose function parameters.

csImageFile can be used in C# scripts, but early binding must be used as described in the next section. The code needed to stream the image is shown below:

```
Array OutArray = (Array)(Image.GIFData);
Byte[] ByteArray = new Byte[OutArray.Length];
Array.Copy(OutArray, ByteArray, OutArray.Length);
Response.ContentType = "image/gif";
Response.BinaryWrite(ByteArray);
```

11.4.1. Early Binding

The previous example used late binding, which is the easier way of calling an ASP component in ASP.NET. It is more efficient to use early binding, but this requires the creation of a .NET Framework Interop Assembly using the TLBIMP tool, supplied with the Framework. This assembly is a DLL which acts as a wrapper for the ASP component.

After registering the component, run TLBIMP.exe from the command prompt or from the Run box in the Start Menu. The syntax is:

```
TLBIMP ComponentName.dll /out:NewName.dll
```

Full paths are required for both DLLs. The new DLL needs to be put in the website's BIN directory. The script that calls the component must import the Interop Assembly as a NameSpace. The component instance is created using the following VB.NET syntax:

```
Dim ObjName As New ClassNameClass()
```

ObjName is the name of the object instance and *ClassName* is the name of the class in the ASP component, which is `Manage` in `csImageFile`.

The script that uses the component must import the Interop Assembly as a Namespace. If the Interop Assembly is called "csimagefilenet.dll" the following line imports it:

```
<%@ Import Namespace = "csimagefilenet" %>
```

In the previous example the only other change required is to replace the `Server.CreateObject` line with:

```
Dim Image As New ManageClass()
```

12. Utility Functions

There are a number of utility functions provided for convenience which are mostly related to file handling. Some of them are restricted to use in ASP. For a full range of file handling functions use the File System Object instead.

FileExists(*FileName*) - Boolean property, read only. Checks for the existence of the file defined by *FileName*. *FileName* is a string and must be a physical path.

CurrentDir - String property, read only. This can only be used in ASP scripts and it returns the physical path of the directory containing the script, complete with trailing backslash.

ParentDir(*Directory*) - String property, read only. This returns the physical path of the parent directory to *Directory*. *Directory* is a string.

Example:

```
Response.Write Image.ParentDir(Image.CurrentDir)
```

This would display the directory immediately above the directory containing the script.

DirName - String property. This is the directory that will be listed in the *FileList* collection. It is a physical path and can include a single filter in the name.

Example 1:

```
Image.DirName = "C:\images\"
```

This will assign all the files in the "images" directory to the *FileList* collection.

```
Image.DirName = "C:\images\*.jpg"
```

This will assign all the files in the "images" directory with a .jpg extension to the *FileList* collection.

FileList - Collection of strings. When a directory is assigned to the *DirName* property this collection will be populated by a list of the files in that directory. As a Collection it can be accessed by index using the *Item* property, or in a For..Each loop, and it has a *Count* property.

Example:

```
Image.DirName = "C:\images\*.jpg"  
For Each JPG in Image.FileList  
    Response.Write JPG & "<br>"  
Next
```

This would display all the .jpg files in the specified directory.

DirSortType - Integer enumeration. This determines the order of the files in the *FileList* collection. It must be set before the *DirName* property. Available values are 0 - alphabetical ascending, 1 - alphabetical descending, 2 - date order ascending, 3 - date order descending. The default is 0. For date sorting it is the last modified date that is used.

Delete *FileName* - This deletes the file specified by the physical path *FileName*. Note that it is permanently deleted NOT placed in the Recycle Bin. *FileName* is a string.

Copy *OldName*, *NewName* - This copies the file *OldName* to the location and name given by *NewName*. Full paths are required. *OldName* and *NewName* are strings.

Rename *OldName, NewName* - This renames the file *OldName* to *NewName*. Physical paths are required. Renaming to a different directory is the equivalent of moving the file. *OldName* and *NewName* are strings.

GetFileName(*Path*) - This function returns the file name, complete with extension but without the directory structure, where *Path* is a physical path and file name. *Path* is a string.

GetExtension(*Path*) - This function returns the extension, complete with the period character, where *Path* is a physical path and file name. *Path* is a string.

AppendToFile *FileName, NewLine* - This function appends the string *NewLine* to the text file *FileName*. If the text file does not exist it will be created if possible. The physical path is required. *FileName* and *NewLine* are strings.

Example:

```
Image.AppendToFile Image.CurrentDir & "test.txt", "Testing"
```

This will append the line "Testing" at the end of a text file called "test.txt" which is in the same directory as the script. If the file does not exist it will create it.

AppendToFile is the only command in this component for manipulating text files. It is useful for maintaining a simple log or to assist in debugging. For a complete set of commands for working with text files, use the File System Object.

All the file handling routines require that the Internet Guest User account has the appropriate permissions. If files are to be accessed across a network, Component Services will need to be configured as described in Section 1.4.

GetTickCount - Integer property, read only. This returns the number of milliseconds that have elapsed since the computer was switched on. It can be used for timing sections of code.

Example:

```
T = Image.GetTickCount  
' Code that is to be timed  
T = Image.GetTickCount - T  
Response.Write T
```

This will display the number of milliseconds taken for the code to run. If it is less than 0.5 milliseconds it will return zero.

DecodeUTF8(*InStr*) - This function returns an ANSI string if *InStr* contains UTF-8 encoded characters. It can be used in classic ASP to decode a query string that has been encoded using the Javascript *encodeURIComponent* function. The resulting string could be passed to the *Text* method in *csImageFile*.

Example:

```
Text = Image.DecodeUTF8(Request.QueryString("ImageText"))  
Image.Text X, Y, Text
```

12.1. Finding Image Dimensions

The following methods and properties allow the dimensions of an image to be found without loading it into the component memory. This avoids the need to decode a compressed image and so image

dimensions can be found quickly if that is all that is required. This functionality will continue to work in the trial version even after the expiry date.

GetDimensions FileName - *FileName* is a string and is the physical path to the file. This populates the four read only properties described below. It will raise an exception if the file cannot be found or opened but will simply set the properties to zero if the file is in an invalid format.

GetDimensionsBin FileStream - *FileStream* is a variant array containing an image. This populates the four read only properties described below. It does not raise an exception on failure.

If the file is a multipage TIFF the page read is determined by the *ReadImageNumber* property.

ReadWidth - Integer, read only. The width of an image in pixels tested by *GetDimensions* or *GetDimensionsBin*.

ReadHeight - Integer, read only. The height of an image in pixels tested by *GetDimensions* or *GetDimensionsBin*.

ReadXDPI - Integer, read only. The horizontal pixel density of an image tested by *GetDimensions* or *GetDimensionsBin*, measured in dots per inch.

ReadYDPI - Integer, read only. The vertical pixel density of an image tested by *GetDimensions* or *GetDimensionsBin*, measured in dots per inch.

13. Web Examples

There are a number of web pages on the Chestysoft web site that provide further reference. These include some tips on getting started and troubleshooting, code examples that can be downloaded, and working examples on our demonstration site.

ASP Examples: www.chestysoft.com/imagefile/examplesasp.asp

Cold Fusion Examples: www.chestysoft.com/imagefile/examplestcf.htm

Both of these pages contain links to all the available examples and tutorials.

14. Supported Image Formats

csImageFile supports the reading and writing of files in most popular formats commonly found on the web. These formats are briefly summarised here.

14.1. BMP (Bitmap)

BMP is the standard graphics format for Windows systems. The image is stored uncompressed and can be in either 24 bit or a paletted format. The palette can be either 256 colour (8 bit), 16 colour (4 bit) or monochrome (1 bit).

Bitmaps are usually larger file sizes than other images because they are uncompressed but they are often faster to import and export because there is no compression to calculate.

14.2. JPG / JPEG / JPE (Joint Photographic Experts Group)

The JPEG file format is probably the most common method of saving full colour images, typically photographs, when a high level of compression is required. It uses a "lossy" compression method, which means that the image read from a saved file will not be identical to the original image before it was saved.

Repeated loading and saving of a JPEG file will result in deterioration of the quality, and should be avoided, but at the levels of compression typically used for saving photographs, the loss of quality is hardly noticeable when the file is saved once from its original. The type of compression used by JPEGs does not produce good quality images that contain sharp edges and text as these edges often become blurred on saving, even using a low compression level. The *JpegQuality* property controls the amount of compression used when a JPEG is saved.

JPEG compression / quality is not a universal value and different software packages use different scales. It cannot be read directly from an image, although csImageFile has a read only property, *JpegApproxQuality*, that gives an approximate value. This could be useful when reading images that have already been compressed in order to save them again with a similar level of compression. If *JpegQuality* is set to a higher value than that originally used to save the image, the new image will have a larger file size without gaining any quality, and it is better to avoid this if possible.

<p>JpegApproxQuality - Integer in the range 0 to 100, read only. When a JPG is loaded, this property contains an approximate value for the compression (quality) used when the image was saved. It corresponds to the same range of values as <i>JpegQuality</i> except 0 indicates the value is undefined.</p>
--

<p>JpegApproxQualityError - Double, read only. When a JPG is loaded, this property contains an indication of the accuracy of the <i>JpegApproxQuality</i> property. A lower value indicates a higher level of accuracy. A value of less than 1 indicates that <i>JpegApproxQuality</i> is a reliable measure of the quality while a value of tens or hundreds indicates that <i>JpegApproxQuality</i> is merely an approximate estimate.</p>

JPEG files stored in CMYK colour space can be read by csImageFile and are automatically converted to RGB. The *WasCMYK* property is set to true to indicate a conversion has taken place. Saving to CMYK is not supported.

IPTC text (File Info) and Exif data can be stored in JPEG files and this data can be read and edited with csImageFile. This meta data can be removed by calling the *ClearMetaData* method, and this can reduce the file size.

JPEG images are usually stored as 24 bit RGB images but they can also be stored as 8 bit greyscale. See the *JpegGrayScale* property for details.

csImageFile provides an option for opening JPEG files at a higher speed while reducing image quality. This can be useful if speed is important, for example when creating thumbnails dynamically. Set the *JpegHigherSpeed* property to true before loading the image for this to take effect.

14.3. GIF (Graphics Interchange Format)

GIF format saves files using 256 colours or less. It can compress images with large areas of a single colour very efficiently and is commonly used in web pages for backgrounds, logos, etc. The compression is "lossless". GIFs use the LZW compression method.

GIF images support the use of a transparent colour. See the *Transparent* and *TransparentColor* properties for details.

GIF files can contain multiple images (or frames) and these are usually used to create animations for use in web pages. csImageFile does not support multi frame GIFs and will only read the first frame. We have a component that can work with multi frame GIFs called csASPGif - www.chestysoft.com/aspgif/default.asp.

14.4. PNG (Portable Network Graphics)

The PNG format provides an efficient lossless compression of image data and it uses the same compression method as zip files. It provides a wide range of colour depths, but these are not all supported for writing by csImageFile, although they can be read. Supported colour depths are 24 bit, 8 bit, 4 bit and 1 bit. Paletted images support single colour transparency in the same way as GIF files.

The PNG format also allows for an alpha channel where a transparency amount is specified for each pixel. csImageFile supports this from version 6.4, and the alpha channel can be used when images are merged. An image with an alpha channel can be resized, rotated, cropped or flipped while preserving the transparency. Any other editing will clear the alpha channel unless instructed otherwise by setting the *KeepAlpha* property. If the image is exported to another format, the pixels are merged with the background colour of the PNG image and the alpha channel is lost.

14.5. TIF / TIFF (Tagged Image File Format)

The TIF file format allows images to be stored in many different ways. The baseline TIF specification is fully supported by csImageFile and this allows for images to be stored as 24 bit RGB, paletted (8 bit or 4 bit), greyscale or black and white. The image can be uncompressed or stored using the Packbits compression method which is a lossless run-length compression.

In addition to the baseline specification, some extensions to the TIF format are supported as described below.

Images stored using the CCITT Group 3 or Group 4 fax compression schemes can be read. Files can be written using Group 4 compression. These compression schemes apply to black and white images only and are very efficient.

Files stored in CMYK colour space can be read and are automatically converted to RGB. The *WasCMYK* property is set to true to indicate a conversion has taken place. Saving to CMYK is not supported.

Files stored using LZW compression can be read, but this compression method is not available for writing.

TIF files can contain multiple pages and support for this is described in Section 2.4.

IPTC text (File Info) and Exif data can be stored in TIF files. `csImageFile` supports IPTC as described in Section 6. Exif is not currently supported.

There are further extensions to the TIF format that are not supported by `csImageFile` including JPEG compression, YcbCr and LAB.

14.6. PSD (Photoshop Format)

This is the standard format used by Adobe Photoshop to save images. A PSD file can contain multiple layers of an image, as well as the composite image created by combining the layers together. As `csImageFile` only holds a single image, it simply reads the composite image and ignores the layers. A PSD file saved by `csImageFile` will only have a composite image and no layers.

Files stored in CMYK colour space can be read and are automatically converted to RGB. The `WasCMYK` property is set to true to indicate a conversion has taken place. Saving to CMYK is not supported.

Reading and writing IPTC text (File Info) in PSD files is supported.

14.7. PCX (ZSoft Paintbrush Format)

PCX is an old format for saving images of all colour depths. It uses a simple run length encoding compression system which is lossless but not very efficient. It is not commonly used today.

14.8. WBMP / WBM (Wireless Bitmap)

The WBMP format is used by WAP devices. It only supports black and white images.

14.9. PDF (Portable Document Format)

`csImageFile` can save images to PDF files. The images are always saved one per page, with the page size set equal to the image size.

Images are exported to PDF by using the `WriteFile` method with ".pdf" used as the file extension, or by using the `PDFData` property. Multiple images can be saved to a PDF file by building the PDF pages in memory with the `AddToPDF` method.

The following properties allow the property tags of PDF files to be set before they are saved. They are all strings and their use is self-explanatory. All are empty strings by default.

PDFTitle	-	String.
PDFSubject	-	String.
PDFAuthor	-	String.
PDFKeywords	-	String.

For more advanced PDF creation functions we recommend using the [PDFBuilderASP](#) component from Ciansoft.

PDF (Portable Document Format) is copyright of Adobe Systems Incorporated.

15. Revision History

The current version of csImageFile is 7.0.

The main changes since version 3.0 are described below.

New in Version 3.0:

IPTC / File Info properties added (JPEG metadata).
Sharpen and Blur functions added.
GreyScale method added.
ColorAdjust method added.
Colour depth can be reduced to produce a paletted image.
OverwriteMode added to control renaming uploaded files.

New in version 4.0

Support for PSD and TIF files added.
Support for compressed GIF files added.
File Info properties now include support for .XMP file format.
EXIF attributes can now be read from JPG files.
FileList collection added.
ReadURL can now identify files from the MIME type.
Basic Authentication password and username added to ReadURL method.
ConvertToBW method added.

New in version 4.1

TIF support extended to include LZW and Group 4 compression.
JPG and TIF images using CMYK colour space can be read.
OLE_COLOR conversion functions added.
Polygon method added.
SharpenBy and BlurBy methods added.
ProgressiveJpeg property added.
Use of a bitmap as the fill pattern included.
Unicode support added to Text method.

New in version 4.2

Antialias property for text and drawing functions.
TextJustify property.
Carriage returns can be used with the Text method.
OverwriteChr property.
WasCMYK property.
TIF support extended to include Group 3 compression.

New in version 4.3

OverwriteMetaData method added.
Additional IPTC fields supported.
PSD images using CMYK colour space can be read.
MergeFrontHDC and MergeBackHDC methods added.
Modifications to ReadURL allowing SSL connections and Integrated Windows Authentication.

New in version 4.4

Changes to the way antialiased text is drawn. This is not fully compatible with previous component versions although the overall results are improved. Now the *ColorDepth* property must be set to 24 before drawing the text, and small font sizes will not be antialiased.

IPTC support added for TIF images.

New in version 5.0

Images can now be read when they have the wrong extension, or in the case of binary imports, when the format is not known. ReadVariant, OriginalImageType, IgnoreInputFileType added.

Arc3XY, Circle3XY, CircleCR and PolyBezier methods added.

BlurText property added to allow text to be antialiased as versions 4.2 and 4.3.

ResizeFit added to resize to a specified maximum width and height.

Support for 8 bit greyscale JPEGs, JpegGrayScale property added.

Multi-page TIF support.

Exif support upgraded to Exif version 2.2 with ability to write attributes.

New in Version 6.0

Support for ICC colour profiles.

Palette method and properties added.

Text drawn with TextWrap can now be justified.

ArcText method added.

PixelArray property added.

New in Version 6.1

Images can be exported to PDF.

ReadMetaData method added.

ExifUserComment property added.

HTTPUserComment property added.

Colours are now added to a palette when they are used.

New in Version 6.2

Alpha transparency preserved from PNG images and used in merge functions.

MergeBin and MergeBackBin automatically use transparency details from foreground image.

BGColor property renamed to TransparentColor (BGColor can still be used).

ICC colour profile support extended to TIF images.

OverwriteMetaDataBin method added.

DirSortType property added.

HTTPTimeout property added.

New in Version 6.3

IPTC support extended to include the XMP based IPTC Core Schema.

New in Version 6.4

IPTC support for TIFFs extended to include the XMP based IPTC Core Schema.

XMPPriority property added.

TextTranspercent added.

Hue, Lightness and Saturation conversion methods added.

PDFTitle, PDFSubject, PDFAuthor and PDFKeywords properties added.

New in Version 7.0

Functionality to import, export and edit alpha channels.

Meta data support for people tagging.

XP Summary data properties.

Invert method.

GetDimensions and GetDimensionsBin for finding image sizes without fully loading an image.

DeleteTrailingData method for improved meta data compatibility.

FFO_Rating and FFO_RatingPercent properties.

16. Other Products From Chestysoft

Visit the Chestysoft web site for details of other COM objects.

ActiveX Controls

[csXImage](#)

- An ActiveX control to display, edit and scan images.

[csXGraph](#)

- An ActiveX control to draw pie charts, bar charts and line graphs.

[csXThumbUpload](#)

- Upload multiple files by HTTP or FTP with previews and image edits.

[csXPostUpload](#)

- Uploads batches of files from a client to a server using an HTTP post.

[csXMultiUpload](#)

- Select and upload multiple files and post to a server using HTTP.

ASP Components

[csDrawGraph](#)

- Draw pie charts, bar charts and line graphs in ASP.

[csASPGif](#)

- Create and edit animated GIFs.

[csIniFile](#)

- Read and Edit Windows style inifiles.

[csASPUpload](#)

- Process file uploads through a browser.

[csASPZipFile](#)

- Create zip files and control binary file downloads.

[csFileDownload](#)

- Control file downloads with an ASP script.

[csFTPQuick](#)

- ASP component to transfer files using FTP.

ASP.NET

[csASPNetGraph](#)

- A .NET component to draw pie charts, bar charts and line graphs.

[csNetUpload](#)

- ASP.NET component for saving HTTP uploads.

[csNetDownload](#)

- ASP.NET class to control file downloads.

Web Hosting

We can offer ASP enabled web hosting with our components installed. [Click for more details.](#)

17. Alphabetical List of Commands

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Antialias	21	ExifDataCount	33
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BlurBy	14	ExifValueByIndex	31
BlurText	23	ExifValueByName	31
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BrushStyle	20	FFO_BylineTitle	25
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Circle3XY	18	FFO_Category	25
CircleCR	18	FFO_CiAdrCity	27
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ClearICCProfile	35	FFO_CiAdrPcode	27
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ClearTIF	11	FFO_City	25
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ColorDepth	7	FFO_CopyrightFlag	25
ColorIndex	17	FFO_CopyrightNotice	25
ColorReplace	13	FFO_CountryCode	27
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CompressionType	10	FFO_CustomField1	27
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Copy	44	FFO_DateReleased	26
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DecodeUTF8	45	FFO_HasContactInfo	27
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DeleteTrailingData	34	FFO_ImageURL	25
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FFO_MarkedDefined	26	HasAlpha	36
FFO_ObjectCycle	27	HasBackground	36
FFO_ObjectName	25	HasFileInfo	25
FFO_OriginatingProgram	26	HasICCProfile	35
FFO_OTR	25	HasXMP	28
FFO_ProgramVersion	26	Height	7
FFO_ProvinceState	25	HLSAdjust	13
FFO_ReferenceDate	26	HLSToRGB	14
FFO_ReferenceNumber	26	IgnoreInputFileType	8
FFO_ReferenceService	26	ImageCount	10
FFO_Rating	30	ImageCountBinary	10
FFO_RatingPercent	30	InsertTIF	10
FFO_RightsUsageTerms	27	Invert	14
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FFO_Scene	27	JpegApproxQualityError	48
FFO_SceneAdd	27	JpegGrayScale	8
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FFO_SceneCount	27	JpegQuality	7
FFO_SceneDelete	27	JPGData	9
FFO_SceneInsert	27	KeepAlpha	36
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FFO_SubjectCode	27	KeepXMP	28
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FFO_SubjectCodeDelete	27	MergeBackBin	16
FFO_SubjectCodeInsert	27	MergeBackHDC	16
FFO_Sublocation	27	MergeFront	15
FFO_SuppCat	26	MergeFrontBin	16
FFO_SuppCatAdd	26	MergeFrontHDC	16
FFO_SuppCatClear	26	NewAlpha	36
FFO_SuppCatCount	26	NewFileSize	9
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FFO_TimeCreated	26	OLEColorToStr	14
FFO_TimeReleased	26	OriginalImageType	8
FFO_Title	26	OverwriteChr	8
FFO_Urgency	25	OverwriteMetaData	28
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Polygon	19	TextJustify	22
ProgressiveJpeg	7	TextOpaque	22
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ReadHeight	46	TextStrikeout	22
ReadImageNumber	10	TextTransPercent	23
ReadMetaData	28	TextUnderline	22
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ReadURL	6	TextWrap	23
ReadVariant	6	TIFData	9
ReadWidth	46	Tile	16
ReadYDPI	46	Transparent	8
Rectangle	18	TransparentColor	8
Rename	45	TransPercent	16
Resample	14	UseLZW	9
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