NAME

combine - combine images to create new images.

SYNOPSIS

combine [*options ...*] *image composite* [*mask*] *combined*

DESCRIPTION

combine combine images to create new images.

EXAMPLES

To combine a image of a cockatoo with a perch, use

```
combine cockatoo.miff perch.ras composite.miff
```

To compute the difference between images in a series, use

```
combine -compose difference series.1 series.2 difference.miff
```

To combine a image of a cockatoo with a perch starting at location (100,150), use

```
combine -geometry +100+150 cockatoo.miff perch.ras composite.miff
```

To tile a logo across your image of a cockatoo, use

```
convert +shade 30x60 cockatoo.miff mask.miff
combine -compose bumpmap -tile logo.gif cockatoo.miff mask.miff composite.miff
```

To combine a red, green, and blue color plane into a single composite image, try

```
combine -compose ReplaceGreen red.png green.png red-green.png
combine -compose ReplaceBlue red-green.png blue.png composite.png
```

OPTIONS

-blend *value*

blend the two images a given percent.

-colors *value*

preferred number of colors in the image.

The actual number of colors in the image may be less than your request, but never more. Note, this is a color reduction option. Images with less unique colors than specified with this option will have any duplicate or unused colors removed. Refer to **quantize(9)** for more details.

Note, options **-dither**, **-colorspace**, and **-treedepth** affect the color reduction algorithm.

-colorspace *value*

the type of colorspace: **GRAY**, **OHTA**, **RGB**, **Transparent**, **XYZ**, **YCbCr**, **YIQ**, **YPbPr**, **YUV**, or **CMYK**.

Color reduction, by default, takes place in the RGB color space. Empirical evidence suggests that distances in color spaces such as YUV or YIQ correspond to perceptual color differences more closely than do distances in RGB space. These color spaces may give better results when color reducing an image. Refer to **quantize(9)** for more details.

The **Transparent** color space behaves uniquely in that it preserves the matte channel of the image if it exists.

The **-colors** or **-monochrome** option is required for this option to take effect.

-comment *string*
annotate an image with a comment.

By default, each image is commented with its file name. Use this option to assign a specific comment to the image. Optionally you can include the image filename, type, width, height, or other image attributes by embedding special format characters:

%b file size
%d directory
%e filename extention
%f filename
%h height
%m magick
%p page number
%s scene number
%t top of filename
%w width
%x x resolution
%y y resolution
\n newline
\r carriage return

For example,

-comment "%m:%f %wx%h"

produces an image comment of **MIFF:bird.miff 512x480** for an image titled **bird.miff** and whose width is 512 and height is 480.

If the first character of *string* is **@**, the image comment is read from a file titled by the remaining characters in the string.

-compose *operator*
the type of image composition.

By default, each of the composite image pixels are replaced by the cooresponding image tile pixel. You can choose an alternate composite operation:

Over
In
Out
Atop
Xor
Plus
Minus
Add
Subtract
Difference
Bumpmap
Replace
ReplaceRed
ReplaceGreen
ReplaceBlue

ReplaceMatte

How each operator behaves is described below.

over The result will be the union of the two image shapes, with *composite image* obscuring *image* in the region of overlap.

In The result is simply *composite image* cut by the shape of *image*. None of the image data of *image* will be in the result.

Out The resulting image is *composite image* with the shape of *image* cut out.

Atop The result is the same shape as image *image*, with *composite image* obscuring *image* where the image shapes overlap. Note this differs from **over** because the portion of *composite image* outside *image*'s shape does not appear in the result.

Xor The result is the image data from both *composite image* and *image* that is outside the overlap region. The overlap region will be blank.

Plus The result is just the sum of the image data. Output values are cropped to 255 (no overflow). This operation is independent of the matte channels.

Minus The result of *composite image − image*, with underflow cropped to zero. The matte channel is ignored (set to 255, full coverage).

Add The result of *composite image + image*, with overflow wrapping around (*mod* 256).

Subtract
The result of *composite image - image*, with underflow wrapping around (*mod* 256). The **add** and **subtract** operators can be used to perform reversible transformations.

Difference
The result of abs(*composite image − image*). This is useful for comparing two very similar images.

Bumpmap
The result *image* shaded by *composite image*.

Replace
The resulting image is *image* replaced with *composite image*. Here the matte information is ignored.

ReplaceRed
The resulting image is the red layer in *image* replaced with the red layer in *composite image*. The other layers are copied untouched.

ReplaceGreen
The resulting image is the green layer in *image* replaced with the green layer in *composite image*. The other layers are copied untouched.

ReplaceBlue
The resulting image is the blue layer in *image* replaced with the blue layer in *composite image*. The other layers are copied untouched.

ReplaceMatte
The resulting image is the matte layer in *image* replaced with the matte layer in *composite image*. The other layers are copied untouched.

The image compositor requires a matte, or alpha channel in the image for some operations. This extra channel usually defines a mask which represents a sort of a cookie-cutter for the image. This is the case when matte is 255 (full coverage) for pixels inside the shape, zero outside, and between zero and 255 on the boundary. For certain operations, if *image* does not have a matte channel, it is initialized with 0 for any pixel matching in color to pixel location (0,0), otherwise 255 (to work

properly **borderwidth** must be 0).

-compress *type*
the type of image compression: *None*, *BZip*, *Fax*, *JPEG*, *LZW*, *RunlengthEncoded*, or *Zip*.

Specify **+compress** to store the binary image in an uncompressed format. The default is the compression type of the specified image file.

-density *<width>x<height>*
vertical and horizontal resolution in pixels of the image.

This option specifies an image density when decoding a Postscript or Portable Document page. The default is 72 pixels per inch in the horizontal and vertical direction. This option is used in concert with **-page**.

-displace *<horizontal scale>x<vertical scale>*
shift image pixels as defined by a displacement map.

With this option, *composite image* is used as a displacement map. Black, within the displacement map, is a maximum positive displacement. White is a maximum negative displacement and middle gray is neutral. The displacement is scaled to determine the pixel shift. By default, the displacement applies in both the horizontal and vertical directions. However, if you specify *mask*, *composite image* is the horizontal X displacement and *mask* the vertical Y displacement.

-display *host:display[.screen]*
specifies the X server to contact; see **X(1)**.

-dispose *method*
GIF disposal method.

Here are the valid methods:

0 No disposal specified.
1 Do not dispose.
2 Restore to background color.
3 Restore to previous.

-dither apply Floyd/Steinberg error diffusion to the image.

The basic strategy of dithering is to trade intensity resolution for spatial resolution by averaging the intensities of several neighboring pixels. Images which suffer from severe contouring when reducing colors can be improved with this option.

The **-colors** or **-monochrome** option is required for this option to take effect.

Use **+dither** to render Postscript without text or graphic aliasing.

-font *name*
This option specifies the font to be used for displaying normal text.

If the font is a fully qualified X server font name, the font is obtained from an X server (e.g. -*-helvetica-medium-r-*-*-12-*-*-*-*-*-iso8859-*). To use a TrueType font, precede the TrueType filename with a **@** (e.g. @times.ttf). Otherwise, specify a Postscript font (e.g. helvetica).

-geometry *<width>{%}x<height>{%}{+-}<x offset>{+-}<y offset>{!}{<}{>}*
the width and height of the image.

By default, the width and height are maximum values. That is, the image is expanded or contracted to fit the width and height value while maintaining the aspect ratio of the image. Append an exclamation point to the geometry to force the image size to exactly the size you specify. For example, if you specify **640x480!** the image width is set to 640 pixels and height to 480. If only one factor is specified, both the width and height assume the value.

To specify a percentage width or height instead, append **%**. The image size is multiplied by the width and height percentages to obtain the final image dimensions. To increase the size of an image, use a value greater than 100 (e.g. 125%). To decrease an image's size, use a percentage less than 100.

Use **>** to change the dimensions of the image *only* if its size exceeds the geometry specification. **>** resizes the image *only* if its dimensions is less than the geometry specification. For example, if you specify **640x480>** and the image size is 512x512, the image size does not change. However, if the image is 1024x1024, it is resized to 640x480.

By default the images are combined relative to the image gravity (see **-gravity**). Use *<x offset>* and *<y offset>* to specify a particular location to combine the images.

-gravity *type*

direction image gravitates to within the composite: NorthWest, North, NorthEast, West, Center, East, SouthWest, South, SouthEast. See **X(1)** for details about the gravity specification.

The image may not fill the composite completely (see **-geometry**). The direction you choose specifies where to position the image within the composite. For example *Center* gravity forces the image to be centered within the composite. By default, the image gravity is *NorthWest*.

-interlace *type*

the type of interlacing scheme: **None**, **Line**, **Plane**, or **Partition**. The default is **None**.

This option is used to specify the type of interlacing scheme for raw image formats such as **RGB** or **YUV**. **No** means do not interlace (RGBRGBRGBRGBRGBRGB...), **Line** uses scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...), and **Plane** uses plane interlacing (RRRRRR...GGGGGG...BBBBBB...). **Partition** is like plane except the different planes are saved to individual files (e.g. image.R, image.G, and image.B).

Use **Line**, or **Plane** to create an interlaced GIF or progressive JPEG image.

-label *name*

assign a label to an image.

Use this option to assign a specific label to the image. Optionally you can include the image filename, type, width, height, or other image attributes by embedding special format characters. See **-comment** for details.

For example,

```
-label "%m:%f %wx%h"
```

produces an image label of **MIFF:bird.miff 512x480** for an image titled **bird.miff** and whose width is 512 and height is 480.

If the first character of *string* is **@**, the image label is read from a file titled by the remaining characters in the string.

When converting to Postscript, use this option to specify a header string to print above the image. Specify the label font with **-font**.

-matte store matte channel if the image has one otherwise create an opaque one.

-monochrome
transform the image to black and white.

-negate replace every pixel with its complementary color (white becomes black, yellow becomes blue, etc.).

The red, green, and blue intensities of an image are negated. Use **+negate** to only negate the grayscale pixels of the image.

-page *<width>{%}x<height>{%}{+-}<x offset>{+-}<y offset>{!}{<}{>}*
preferred size and location of an image canvas.

Use this option to specify the dimensions of the Postscript page in dots per inch or a TEXT page in pixels. The choices for a Postscript page are:

11x17	792	1224
Ledger	1224	792
Legal	612	1008
Letter	612	792
LetterSmall	612	792
ArchE	2592	3456
ArchD	1728	2592
ArchC	1296	1728
ArchB	864	1296
ArchA	648	864
A0	2380	3368
A1	1684	2380
A2	1190	1684
A3	842	1190
A4	595	842
A4Small	595	842
A5	421	595
A6	297	421
A7	210	297
A8	148	210
A9	105	148
A10	74	105
B0	2836	4008
B1	2004	2836
B2	1418	2004
B3	1002	1418
B4	709	1002
B5	501	709
C0	2600	3677
C1	1837	2600
C2	1298	1837
C3	918	1298
C4	649	918
C5	459	649
C6	323	459
Flsa	612	936

Flse 612 936
HalfLetter 396 612

For convenience you can specify the page size by media (e.g. A4, Ledger, etc.). Otherwise, **-page** behaves much like **-geometry** (e.g. -page letter+43+43>).

To position a GIF image, use -page *{+-}<x offset>{+-}<y offset>* (e.g. -page +100+200).

For a Postscript page, the image is sized as in **-geometry** and positioned relative to the lower left hand corner of the page by *{+-}<x offset>{+-}<y offset>*. Use -page 612x792>, for example, to center the image within the page. If the image size exceeds the Postscript page, it is reduced to fit the page.

The default page dimensions for a TEXT image is 612x792.

This option is used in concert with **-density**.

-quality *value*
JPEG/MIFF/PNG compression level.

For the JPEG image format, quality is 0 (worst) to 100 (best). The default quality is 75.

Quality for the MIFF and PNG image format sets the amount of image compression (quality / 10) and filter-type (quality % 10). Compression quality values range from 0 (worst) to 100 (best). If filter-type is 4 or less, the specified filter-type is used for all scanlines:

0: none
1: sub
2: up
3: average
4: Paeth

If filter-type is 5, adaptive filtering is used when quality is greater than 50 and the image does not have a color map, otherwise no filtering is used.

If filter-type is 6 or more, adaptive filtering with *minimum-sum-of-absolute-values* is used.

The default is quality is 75. Which means nearly the best compression with adaptive filtering.

For further information, see the PNG specification (RFC 2083), <http://www.w3.org/pub/WWW/TR>.

-scene *value*
image scene number.

-size *<width>x<height>{+offset}*
width and height of the image.

Use this option to specify the width and height of raw images whose dimensions are unknown such as **GRAY**, **RGB**, or **CMYK**. In addition to width and height, use **-size** to skip any header information in the image or tell the number of colors in a **MAP** image file, (e.g. -size 640x512+256).

-stegano *offset*
hide watermark within an image. <p> Use an offset to start the image hiding some number of pixels from the beginning of the image. Note this offset and the image size. You will need this

information to recover the steganographic image (e.g. display -size 320x256+35 stegano:image.png).

-stereo combine two image to create a stereo anaglyph.

The left side of the stereo pair is saved as the red channel of the output image. The right sife is saved as the green channel. Red-blue stereo glasses are required to properly view the stereo image.

-tile repeat composite operation across image.

-treedepth *value*

Normally, this integer value is zero or one. A zero or one tells **combine** to choose a optimal tree depth for the color reduction algorithm.

An optimal depth generally allows the best representation of the source image with the fastest computational speed and the least amount of memory. However, the default depth is inappropriate for some images. To assure the best representation, try values between 2 and 8 for this parameter. Refer to **quantize(9)** for more details.

The **-colors** option is required for this option to take effect.

-verbose

print detailed information about the image.

This information is printed: image scene number; image name; combined image name; image size; the image class (*DirectClass* or *PseudoClass*); the total number of unique colors; and the number of seconds to read and combine the image.

Options are processed in command line order. Any option you specify on the command line remains in effect until it is explicitly changed by specifying the option again with a different effect.

By default, the image format is determined by its magic number. To specify a particular image format, precede the filename with an image format name and a colon (i.e. ps:image) or specify the image type as the filename suffix (i.e. image.ps). See **convert(1)** for a list of valid image formats.

When you specify **X** as your image type, the filename has special meaning. It specifies an X window by id, name, or **root**. If no filename is specified, the window is selected by clicking the mouse in the desired window.

Specify *image* as - for standard input, *combined* as - for standard output. If *image* has the extension **.Z** or **.gz**, the file is uncompressed with **uncompress** or **gunzip** respectively. If *combined* has the extension **.Z** or **.gz**, the file size is compressed using with **compress** or **gzip** respectively. Finally, precede the image file name with | to pipe to or from a system command.

Use an optional index enclosed in brackets after a file name to specify a desired subimage of a multi-resolution image format like Photo CD (e.g. img0001.pcd[4]) or a range for MPEG images (e.g. video.mpg[50-75]). A subimage specification can be disjoint (e.g. image.tiff[2,7,4]). For raw images, specify a subimage with a geometry (e.g. -size 640x512 image.rgb[320x256+50+50]).

The optional **mask** can be used to provide matte information for **composite** when it has none or if you want a different mask. A mask image is typically grayscale and the same size as **composite**. If the image is not grayscale, it is converted to grayscale and the resulting intensities are used as matte information.

If *combined* already exists, you will be prompted as to whether it should be overwritten.

ENVIRONMENT

display To get the default host, display number, and screen.

SEE ALSO

display(1), animate(1), import(1), montage(1), mogrify(1), convert(1), xtp(1)

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