A Visual Guide to Channel Operation

This Word 5.1 document uses Times Roman, in 12 and 24 points. For smoothest viewing, try 256 grays or 24 bit color, though it's useful even with fewer colors showing. No smooth blends used here, so the patterns of interaction will be clearer.

Visual examples help in understanding how Photoshop channels combine. Here's a chart.
Start with 3 sources:

SOURCE A   SOURCE B   SOURCE C

Remember that they must be EXACTLY the same size (pixelwidth X height) to work.

Then use Image>Calculate commands (Format = "Foreground/Operation/Background"):

The command "Duplicate" makes a copy of the currently active channel, so it only takes one source.
The command "Constant" makes a channel with a specified gray level (0 = black, 256 = white.)
Useful with other calculate commands to set a baselevel.
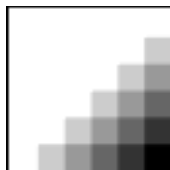
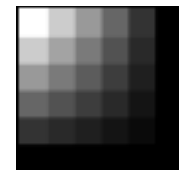A ADD B   A SUBTRACT B   A SCREEN B   A MULTIPLY B

A ADD C   A SUBTRACT C   A SCREEN C   A MULTIPLY C

A DARKER B   A LIGHTER B   A DIFFERENCE B   A BLEND B (50%)

A DARKER C   A LIGHTER C   A DIFFERENCE C   A BLEND C (50%)

Note that Blend can be ANY percentage of foreground, with different results, and that the antialiasing of the text character in Source C definitely shows up in Difference with a gray scale channel! If you need to fix this, try using Levels first to shrink the character outline in channel C and

improve the abruptness of the contrast. (Thanks to Kai's great Power Tips for revealing this trick and the usefulness of the Calculate commands.)

The Composite command uses three "control" channels, so it can get quite a bit more complex; but that's part of their usefulness. Sometimes you can do things with one composite that might take two or three other operations to do otherwise.

FOREGROUND A
BACKGROUND B
MASK C

FOREGROUND A
BACKGROUND C
MASK C

FOREGROUND A
BACKGROUND C
MASK A

FOREGROUND A
BACKGROUND C
MASK B

FOREGROUND B
BACKGROUND A
MASK C

FOREGROUND B
BACKGROUND C
MASK C

FOREGROUND B
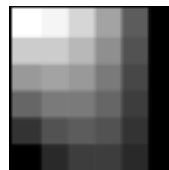BACKGROUND C
MASK A

FOREGROUND B
BACKGROUND C
MASK B

FOREGROUND A
BACKGROUND B
MASK A

FOREGROUND A
BACKGROUND B
MASK B

FOREGROUND B
BACKGROUND A
MASK A

FOREGROUND B
BACKGROUND A
MASK B

FOREGROUND C
BACKGROUND B
MASK C

FOREGROUND C
BACKGROUND A
MASK C

FOREGROUND C
BACKGROUND B
MASK B

FOREGROUND C
BACKGROUND A
MASK B

FOREGROUND C
BACKGROUND A
MASK A

FOREGROUND C
BACKGROUND B
MASK A

For you math whizzes, yes, there are 9 more combinations possible. (So don't say I didn't tell you about them.) BUT when foreground and background channels are the same, no matter which mask you use, you just get a new duplicate of your foreground/background channel.

I hope this makes it easier to visualize Photoshop operations.

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Feedback welcome! AOL: "GeorgeMack"
(No cloak and dagger code names for me…)