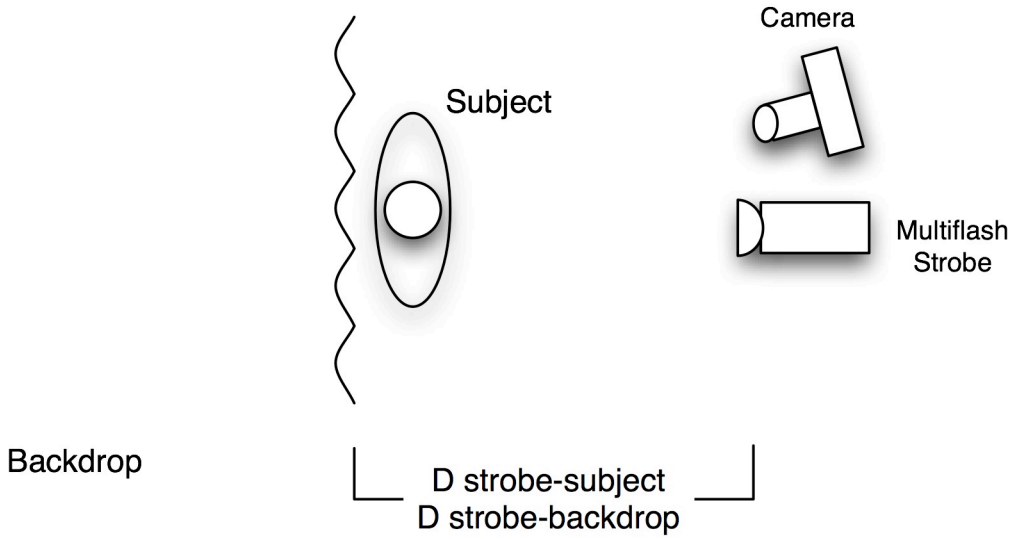
Multiflash Exposures

In taking a multiflash photo, the subject will (generally) move between flashes while the backdrop will not. If the subject moves far enough between each flash then its successive images do not overlap on the film, and the exposure of the subject is set by the light output of *one* flash and the strobe-to-subject distance. As the backdrop doesn't move, the exposure of the backdrop is set by the integrated light output of the *N* flashes and the strobe-to-backdrop distance. To get a good exposure of the subject from a single flash, we must satisfy the BCPS equation[1]:

$$D_{STROBE-SUBJECT} \times A = \sqrt{\frac{BCPS \times s}{c}}. \qquad \text{Eq. 1}$$

If the backdrop is directly behind the subject (i.e., both subject and backdrop are equally far from the strobe), then, if the subject is well exposed, the backdrop will be overexposed by a factor of *N*. If *N=2*, then the backdrop receives twice the light needed (over exposed by one f-stop); if *N=4*, the backdrop receives four times the light needed (over exposed by two f-stops); if *N=8*, then the backdrop receives eight times the light needed (over exposed by three f-stops); etc.



To get the backdrop well exposed we need to satisfy the relationship

$$D_{STROBE-BACKDROP} \times A = \sqrt{\frac{N \times BCPS \times s}{c}}. \qquad \text{Eq. 2}$$

Since the images of subject and backdrop are created on the same piece of film, and the light from both pass through the same aperture, we must use the same *A* and *s* for Equations 1 and 2. (Similarly the constant *c* must be the same for both!) So, to satisfy both equations requires:

$$D_{STROBE-BACKDROP} / \sqrt{N} = D_{STROBE-SUBJECT}, \qquad \text{Eq. 3}$$

or

$$D_{STROBE-BACKDROP} = D_{STROBE-SUBJECT} \times \sqrt{N}. \qquad \text{Eq. 4}$$

This assumes that both the subject and backdrop are well exposed! The constraint can be relaxed if you can life with either the subject being underexposed or the backdrop being overexposed.

[1] Here we ignore the magnification factor, *m*.