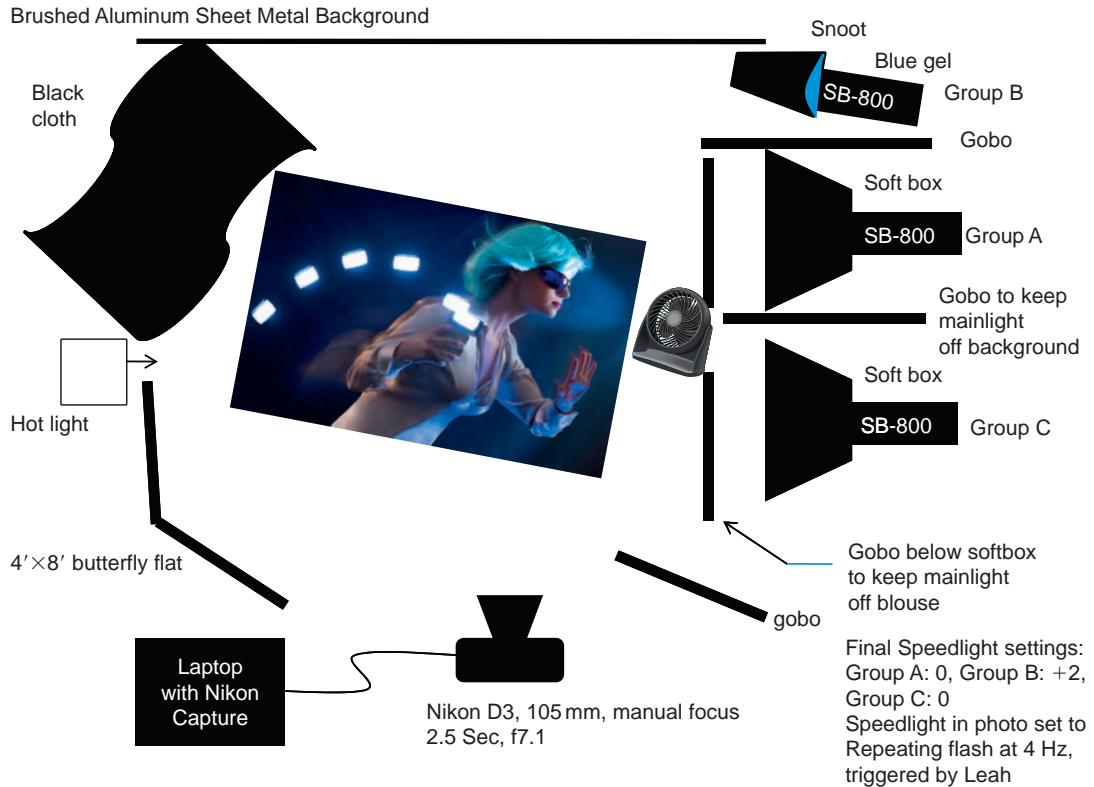


Speedlights & Speedlites



Traveling at Lightspeed

We mulled over the cover of this book for quite a while and rejected a lot of ideas. By accident I struck upon featuring the Speedlight in the photograph. I also wanted to incorporate a number of the techniques that we talk about on the pages of this book. But like everything, it all comes down to money. There was a budget. We searched a lot of models' portfolios to find the perfect subject. In the end I pressed my studio manager into service.

I wanted to imply movement. We handled this in a couple of ways: the photograph was shot on a slant so the woman's hair hung at an angle. We used a fan to add to the illusion. A tungsten light was placed behind the model to create some blur.

Four Speedlights, in three groups, doing separate jobs: lighting her face and hair with daylight; adding the comet-like background light; emphasizing the blue color but keeping it off her face. The trick was timing when to have Leah initiate the stroboscopic Speedlight in her hand each time we made an exposure.

We used lots of gobos to keep each light from "contaminating" the others. So there was a great deal of fine tuning. But the whole shot was done in about twenty exposures which is a testament to the methods we have at our fingertips today.

Speedlights & Speedlites

Creative Flash Photography at Lightspeed

Lou Jones

Bob Keenan

Steve Ostrowski



ELSEVIER

AMSTERDAM • BOSTON • HEIDELBERG • LONDON • NEW YORK • OXFORD
PARIS • SAN DIEGO • SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO

Focal Press is an imprint of Elsevier



Focal Press is an imprint of Elsevier
30 Corporate Drive, Suite 400, Burlington, MA 01803, USA
Linacre House, Jordan Hill, Oxford OX2 8DP, UK

Copyright © 2009, Elsevier Inc. All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Permissions may be sought directly from Elsevier's Science & Technology Rights Department in Oxford, UK: phone: (+44) 1865 843830, fax: (+44) 1865 853333, E-mail: permissions@elsevier.com. You may also complete your request on-line via the Elsevier homepage (<http://elsevier.com>), by selecting "Support & Contact" then "Copyright and Permission" and then "Obtaining Permissions."

Library of Congress Cataloging-in-Publication Data

Application submitted

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

ISBN: 978-0-240-81207-6

For information on all Focal Press publications
visit our website at www.elsevierdirect.com

09 10 11 12 5 4 3 2 1

Printed in Canada

Working together to grow
libraries in developing countries

www.elsevier.com | www.bookaid.org | www.sabre.org

ELSEVIER

BOOK AID
International

Sabre Foundation

Contents

Speed of Light	viii
Color Coding Key	ix
Ten Tenets of TTL Speedlights	x
Introduction	xi
The Authors	xiv
Chapter 1: One Light	1
TTL Flash.....	2
Electronic Flash: Definition.....	2
Speedlight/Speedlite: Definition.....	3
Fundamentals of Electronic Flash.....	9
Comprehending Flash Exposure.....	11
TTL Electronic Flash: Definition.....	14
TTL Exposure System.....	16
TTL Flash and Exposure: A Primer.....	16
TTL Flash and Aperture.....	17
TTL Flash and Distance.....	17
Inverse Square Law.....	18
TTL Flash and Subject Size.....	20
TTL Flash and Shutter Speed: Synchronization.....	20
TTL Flash: Flash Anatomy and Features.....	20
Speedlight Components.....	20
The LCD.....	30
Measuring Light.....	31
Understanding the Light Meter.....	32
Stops, F/Stops, Exposure Value.....	35
Histogram.....	40
RGB Histogram.....	43
Exposure Bias for Digital.....	44
Middle Tonal Value.....	44
Exposure Compensation.....	44
Excessive Contrast.....	45
Mastering Distance: Near and Far.....	46
Main Light and Fill Light: Definitions.....	48
Philosophy.....	50

Light.....	50
Characteristics of Light: Analysis and Decisions	54
Quantity, Intensity, or Brightness.....	54
Quality.....	56
Contrast.....	61
Color	62
Color Spaces and the Color Triangle	65
Direction.....	67
Mixing TTL Flash with Available Light: Quantities of Light.....	68
Available Light as Main	68
TTL Flash as Fill.....	68
TTL Flash as Main	70
Available Light as Fill	71
General Guidelines	73
Balancing TTL Flash and Available Light: Colors of Light.....	73
Bounce Flash: Direction and Quality of Light.....	75
Moving Light	77
Comprehending Directions of Bounce Flash.....	77
Chapter 2: Two Lights	87
Light	89
Lighting.....	91
Design	91
Execute	92
Review.....	92
Postproduction	92
Wireless	96
Wireless TTL: Remote/Slave Flash	96
Wireless TTL: Additional Trigger Devices Need Not Apply!.....	96
Nikon SU-4 Mode	97
Wireless TTL Transmitters: Master	99
Wireless TTL Receivers: Remote/Slave	99
Wireless TTL Communication: Line of Sight	102
Wireless TTL: Remote/Slave ID Groups.....	105
Wireless TTL: Channels	106
Wireless TTL: Privacy	108
Travel	108
Wireless TTL: Basic Settings for Master and Slave	110
Wireless TTL: Controlling Exposure and Contrast.....	112
Manual Flash	121
How It Works.....	121
Flash LCD.....	126
Wireless Manual Flash	128

Mixing Speedlights with Studio Flashes..... 129

Modifying Flash: Quality of Light..... 132

Softboxes: Notes 132

Equipment, Accessories, Products 136

 Equipment..... 137

 Batteries: Powering the Flash 144

 Battery Types: Power Decisions 145

 Accessories 147

Summary..... 153

Lighting Diagrams..... 155

Index..... 201

Speed of Light

soot soaked shadows
projecting moving pictures
upon a cavedwelling wall
as toxic bonfires choke life from the artist
prehistoric transfers to permanent
pale paraffin candles melt dimension into painted canvases
oily pigments made more unctuous
baked by their heat
zoetropes
magic lanterns
klieg lights
and their wrath of flame
illuminate all things
seen and unseen
and take their turn substituting for day
flashflashblindingflash
when we finish here
like gods
we will learn to move the sun

Lou Jones
December 2006

Color Coding Key

Brand-specific information is indicated by the following colors:

Green: Canon Speedlite 550EX/580EX/550 EXMKII/580 EXMKII flashes, used with compatible Canon EOS cameras.

Purple: Nikon Speedlight SB-900/SB-800, Nikon Speedlight Commander SU-800, used with compatible Nikon cameras.

Some of the information in the book has been categorized in an effort to increase accessibility. Six aspects are differentiated with the following background colors:

Solutions: Olive green

Warning: Red

Example: Orange

Anecdote: Tan

Textbook: Gray

Vocabulary: Yellow

Ten Tenets of TTL Speedlights

1. Separate. Get those Speedlights off camera.
2. Bounce. If you can't separate, bounce it. Bounce it anyway.
3. Resist using Speedlights strictly on manual. The computer can outthink you.
4. In any camera exposure mode, when correctly exposing for existing light, the camera computer will automatically reduce TTL flash to a fill light.
5. LCD = aesthetic; histogram = exposure. Use them both.
6. Exposure Compensation is used to change the TTL ambient exposure and Flash Exposure Compensation is used to correct the flash exposure on the subject.
7. Expose to the right (on the histogram). Underexposure provides no benefit.
8. Take your camera seriously, don't abuse postproduction.
9. No Fear. Just do it.
10. The elegant solution is often the simplest solution.

Introduction

Once upon a time I pushed a thumb-sized red button and exposed a roll of black and white film. Several months later I retrieved an envelope filled with postcard sized pictures of my friends marching in a Boy Scout parade. Memories forged a lifetime ago. In fact not only do I still have most of those photographs but I still cherish the original camera, a marvel of modern technology, the Kodak¹ Brownie Starflex. Not only was it a symbol of a decades-long race to permanently capture an image on paper, but it was small, light, and foolproof. Somewhere in my attic I have also saved the silver dish into which I inserted golf ball sized flashbulbs that miraculously “focused” the sun for the briefest fraction of a second. In a relatively short time those innovations morphed into today’s digital miracles.

Photography is cameras. But a better axiom dictates that **good photography is lighting.** Distinguished craftspeople, artists are masters of light. Whether photographers are striving to imitate Renaissance painters and their classic “Rembrandt lighting” or experimenting with cutting edge, unorthodox sources, such as ring lights or HMI’s, the camera is secondary — the light paramount. Learning to “see” or “re-create” light can take a lifetime. Designing stylized illumination, or mimicking the sun, may be opposite ends of the visual spectrum but they are equally difficult to accomplish.

Cameras have historically been the major focus of photographic innovations. Wooden frames, accordion bellows, twin lens reflex, rangefinder apparitions, pentaprisms, and instant gratification films have dotted the imaging landscape. Millions and possibly billions have been invested in making the proclivity for taking pictures as foolproof as those original mass produced box cameras.

A vast majority of photographers are the “shutterbug” equivalent of the motor “gearheads” who enjoy lifting their car hood, changing their own oil, fixing the transmission, and dropping a new engine into vintage automobiles cadged away in cramped garages. Hardware “equipment junkies” thrive in equally cramped darkrooms, buy the latest equipment, and argue incessantly about the merits of each lens and gadget. This dialogue is what keeps camera manufacturers awake at night.

Motordrives, zoom lenses, autofocus, and autoexposure are all improvements that have made the process of taking a usable photograph easier and less obscured by a mastery of craft. The main reason these devices were invented was to enable the consumer to more easily produce acceptable results. But more important, the byproduct of these advances allows skilled practitioners

¹“You press the button, we do the rest.” George Eastman, Kodak.

to do things they never dreamed of doing before: react instantaneously to a new environment, compose a complicated landscape, measure a difficult light condition, chase a fast-changing combat situation, document a slowly evolving wildlife metamorphosis, adjust for bad eyesight caused by the natural burden of aging, and produce better, more provocative images.

It stands to reason that if cameras are keeping up with the photographer's rigorous demands, the lighting equipment needs to keep pace also. Even after cameras became small and compact, lights remained ponderous and complicated. Techniques were artistic, but also idiosyncratic and sacrosanct, requiring a *lot* of practice to be considered competent.

Lighting has always taken a long time to learn. Lights have gotten a little smaller but their mysteries have remained large. Just monitoring their application has always been slow and tedious. Measuring lumens, color temperature, and ratios was formulaic and imperfect.

After flashbulbs, **Doctor Harold Eggerton of Massachusetts Institute of Technology** has been credited with giving us the first practical electronic strobes. For the first time since the invention of photography we were able to easily and safely transport our own reusable light to the photograph instead of always bringing our subjects into the light.

Then came a major breakthrough when the "thyristor"² strobes made tremendous advances in artificial lighting and variable output. The infamous **Vivitar 283** revolutionized the industry for years. Up to that point in history a slide rule and several complicated calculations extrapolated *usable* lighting. And a degree in mathematics or physics did not hurt either.

Since that innovation there has been masterful progress in portable flash. Many companies make their own versions catering to every size, preference, and price range. Whereas amateurs employ portable flashes to quickly produce convenient but clumsy illumination, professionals have long been adept at both wresting beautiful results out of the same equipment and exceeding the design specifications.

Power has always been a major issue. Capacitors and power packs grew large and cumbersome. To assemble enough light for interesting scenarios required multiple light heads and energy sources. This was heavy to carry. Anticipating the outcome was also complicated. Shooting Polaroids was slow. And every step called for experience.

Compact flashes, strobes, and flash guns have partially addressed the portability issue. They are built smaller than their studio counterparts, however, size limits power. And any more than one proves hard to coordinate because you have to reposition or recalibrate each separate light and hardwire them together or set up some kind of electronic triggering system.

²A thyristor is a semiconductor switch capable of automatically switching the flash on and off at very high speeds. It is used to control the duration and output of the flash tube.

Enter the **Speedlight/Speedlite**.³ Every photographer taking pictures today is familiar with this revolution in photography, as it changed from film to digital. There is an equally dramatic evolution in lighting — from flash to **Speedlight/Speedlite**. They look, feel, and work, albeit more versatile, like traditional portable flashes. In fact, they so closely resemble their “cousins,” most photographers continue to use them like old fashioned flashes. But **Speedlights/Speedlites** are the most significant technological advance in the history of lighting. A quantum leap forward. Flash powder with computers attached. Digital sunlight.

Small and portable, **Speedlights/Speedlites** are easy . . . and nearly infallible. The ambitious photographer who needs more “juice” can pack more than one without breaking the bank. They use proprietary technology, currently utilized by two camera manufacturers.⁴ Only their products are compatible with all the features: dozens of flashes ignited simultaneously, wirelessly, each flash programmable to insert different predetermined power outputs, every flash able to be controlled from a single central source, and the final result immediately reviewable on the camera LCD screen. Additionally they can be programmed for stroboscopic effects, rear curtain synchronization, fill flash, higher shutter speed usage, and much more. It is a 35 mm revolution.

“Take a picture, take a look.” The modern digital photographer can quickly set up a battery of **Speedlights/Speedlites** in inaccessible locations, designate outputs for each one, snap a picture, observe the histogram, readjust each light to taste, and start all over without changing position. It is a “closed system.” **Speedlights/Speedlites** are fully integrated with their specific camera for automatic through-the-lens exposure and the camera, in turn, gives instant feedback, monitors the aesthetics of the photograph, measures the contribution, interacts directly with the **Speedlights/Speedlites**, and stores the results. No more wires or clumsy accessories. The flexibility in continuously orchestrating “pieces” of light to accompany the tempo of your imagination is unprecedented.

The potential of the ubiquitous desktop or laptop computer today is barely realized. Because they are so overwhelming the average person only uses a small portion of the computer’s capability. The computers in **Speedlights/Speedlites** are equally sophisticated. Most photographers barely test them. This book proposes to uncloak the complexities of **Speedlights/Speedlites** in plain, systematically organized segments. There are no ratios to calculate. No formulas to memorize. Using your eyes, imagination, intuition, and the LCD/histogram, you can design, meter, and modify one or many **Speedlights/Speedlites** to create drama, color, mood, effects, depth of field, or just more natural looking images. This text will showcase examples and their respective lighting diagrams for your perusal. It is set up so you can read from cover to cover or just those parts you need for your next assignment. Combined with the camera and **Speedlight/Speedlites** manuals, you can quickly perfect a whole new set of skills.

Light a la carte. We decipher the basics. The art is up to you.

³See book definition of **Speedlight/Speedlite** on page 3.

⁴Canon and Nikon.

The Authors

Lou Jones is one of Boston's most diverse commercial and art photographers. This prolific, award-winning photographer specializes in photo illustration and location photography for corporate, advertising, and collateral projects. His client list is as impressive as are his photographs — IBM, FedEx, American Express, Oldsmobile, AETNA, Museum of Fine Arts, Fortune Magazine, *U.S. News & World Report*, and *National Geographic*. Jones' assignments have taken him to Europe, Central and South America, Africa, Japan, and 46 of the 50 states. Assignments have placed Jones on location at NASA, Boeing, Universal Studios, British Telecom (England), and Saab (Sweden).

Bob Keenan is a Boston-area photographer. A retired Electrical Engineer, Bob spent his career designing and developing Radio Frequency communications equipment, so working with the wireless speedlights and the concept of light pulses is a natural fit. Bob is a graduate of the Boston University's Center for Digital Imaging's Photography Program

Steve Ostrowski is an award winning photographer with over 30 years experience in Commercial, Editorial, Annual Report, Fashion, Portrait, and Event photography. He has worked with small flash as a studio and location lighting tool since 1977. He is currently an instructor at The New England School of Photography in Boston, MA; teaching Editorial Photography as a major course of study, digital camera techniques, and specializing in teaching lighting with Wireless TTL Flash.